

# JMVH

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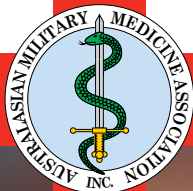
Journal of Military and Veterans' Health



- Military Medical Student Experiences during a Prolonged Casualty Care Simulation
- Gastrointestinal Mortality in Military / Prison Camps of the 19th-20th Centuries
- 2023 AMMA Conference Abstracts and Posters

The Journal of the Australasian Military Medicine Association





# Call for photographs

The Journal of Military and Veteran's Health is a peer reviewed quarterly publication published by the Australasian Military Medicine Association.

The JMVH is always looking for quality cover images, if you have taken a photograph that you think would be suitable and interesting for the cover of an issue of the Journal, please email [secretariat@amma.asn.au](mailto:secretariat@amma.asn.au)

JMVH

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# Journal of Military and Veterans' Health

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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



Vale Colonel  
Peter Leggat, AM,  
ADC, JP, KSTJ

As we gather for the first AMMA Conference to be held in Perth, it is with great sadness that we acknowledge the passing of Emeritus Professor and Colonel Peter Leggat on 20 September 2023. Peter graduated in medical science

and medicine from the University of Queensland, before undertaking postgraduate studies at various universities, including Mahidol University, the University of Dundee, and the University of Otago, and completing doctorates at the University of South Australia and James Cook University and a higher doctorate at the University of Queensland.

After over 30 years of service at James Cook University (JCU), including in many leadership roles, Peter had recently retired as Professor Emeritus, and Director Emeritus of the World Health Organization Collaborating Centre for Vector-borne and Neglected Tropical Diseases at JCU. He was a former Fulbright Scholar and, as an academic researcher, Peter had published over 500 journal papers, more than 100 book chapters and 35 books, and presented over 400 papers at national and international conferences. He was passionate about public health, tropical and travel medicine, was a founding Fellow and five-time president of the Australasian College of Tropical Medicine (ACTM) and was one of Australia's greatest contributors to these fields. JCU has established an Emeritus Professor Peter Leggat Memorial Fund in his honour to support students specialising in travel and tropical medicine.

Colonel Leggat joined the Australian Regular Army in 1987. He was posted to various units, including the historic 2 Field Ambulance in Townsville. He served in Thailand attached to the Australian Embassy, Bangkok, and he deployed to East Timor in 2000. He later served in several reserve postings, including as Honorary Aide-de-Camp to the Governor General of the Commonwealth of Australia. Peter joined AMMA in 2009 and has been a valued member of the JMVH Editorial Board, providing exceptional insight and dedication over the years.

Colonel Leggat was admitted as a Member of the General Division of the Order of Australia in the 2013 Queen's Birthday Honours List, primarily for his service to St. John Ambulance Australia. In 2021, Colonel Leggat was promoted to Knight of Grace of the Order of St John in the 2021 Admissions and Promotions list.

On a personal note, I met Peter in the late 1980's at some of the earlier ACTM Conferences. Peter was a much respected and treasured friend and colleague, who was always supportive and an inspirational mentor for many in Australia. I was fortunate to collaborate with him on several public health courses at JCU and on JMVH over the last twenty years and he was instrumental in my receiving an adjunct professorial appointment and an Honorary Doctor of Science at JCU. Always a gentleman, Peter's quiet wisdom, calm guidance, unassuming selfless nature, humour, leadership and passion for learning and life will be missed by many of us. I had only recently received his annual Christmas in July update, which provided news of the house he and Pan were building in Thailand, his leadership of various national and international organisations and some recent travels to Ecuador. A full life lived well and too soon lost.

Our final issue of 2023 contains a range of articles and book reviews on diverse topics spanning casualty care simulations, infectious disease history, mental health, veterans with disabilities and spiritual health. We continue to attract a good range of articles, including from overseas. Other military and veterans' health articles, however, are always very welcome, and we would encourage all our readers to consider writing on their areas of military or veterans' health interest. We would particularly welcome papers based on presentations from our 2023 conference in Perth but welcome any articles across the broader spectrum of military health.

I look forward to seeing you in Perth.

**Dr Andy Robertson, CSC, PSM**  
**Commodore, RAN**  
**Editor-in-Chief**

# Improving Adherence to CPAP Among Veterans with a Comorbid Psychiatric Disorder Using a Combined Behavioral Group Treatment

J. Hung, E. Erlyana, Y. Lu, L. Barbir

## Abstract

Positive Airway Pressure (PAP) adherence is vital in optimising the reduction of anxiety symptoms severity. Previous research indicates that treatment of sleep apnoea with continuous positive airway pressure (CPAP) is associated with reduced post-traumatic stress disorder (PTSD) related nightmares and improved overall PTSD symptoms among veterans with PTSD and obstructive sleep apnoea (OSA). Improvement of PTSD symptoms in veterans with OSA was found to be more pronounced with prolonged use of CPAP. The study included 397 veterans with a comorbid psychiatric disorder, 92 of whom participated in CPAP behavioural group treatment, and 305 with similar demographics and behavioural health profiles were retrospectively included as controls (92% were male; 64% were diagnosed with PTSD). Multivariable linear regression results showed that adherence to CPAP use within the past 30 days was significantly higher in the treatment group at 1 month, 3 months, 6 months and 1 year after treatment, compared to the control group (7.2, 11.8, 11.3 and 9.2 percentage points higher respectively, all  $p < 0.001$ ), after controlling for demographics and relevant disease history.

**Keywords:** Obstructive Sleep Apnoea (OSA), Continuous Positive Airway Pressure (CPAP), veterans, psychiatric disorders, behavioural group treatment

## Introduction

### CPAP non-adherence prevalence

Continuous Positive Airway Pressure (CPAP) non-adherence rates typically range from 46–83%<sup>1</sup> in the general population and more so in psychiatric patients with obstructive sleep apnoea (OSA) comorbidity.<sup>2</sup> Furthermore, veterans with OSA and comorbid post-traumatic stress disorder (PTSD) are significantly less likely to use their CPAP than those with obstructive sleep apnoea and no comorbid PTSD.<sup>3–6</sup> Veterans with comorbid insomnia, PTSD and OSA are significantly less likely to use CPAP than veterans with PTSD and OSA only.<sup>7</sup> The same is true for veterans with sleep apnoea and comorbid claustrophobia.<sup>8,9</sup> These lower adherence rates are especially concerning given the findings of the significantly increased prevalence of OSA in individuals with PTSD compared to those without PTSD.<sup>6,10–12</sup> In fact, a recent study has shown a higher prevalence of sleep apnoea in veterans with PTSD.<sup>13</sup>

It is estimated that 69 to 83% of veterans have OSA, while 80 to 90% are undiagnosed or untreated.<sup>13</sup>

### Consequences of CPAP non-adherence

CPAP adherence is vital in optimising the reduction of PTSD symptom severity. Previous research indicates that sleep apnoea treatment with CPAP is associated with reduced PTSD-related nightmares and improved overall PTSD symptoms among veterans with PTSD and sleep apnoea.<sup>4,5,14–17</sup> Improvement of PTSD symptoms in veterans with OSA was found to be more pronounced with prolonged use of CPAP.<sup>14</sup> Conversely, Reist and colleagues (2017) showed that untreated sleep apnoea reduced the efficacy of prolonged exposure therapy for PTSD.<sup>18</sup> Furthermore, Mesa and colleagues (2017) found that untreated OSA among veterans with PTSD completing cognitive processing therapy (CPT) mitigated treatment outcomes, with those having access to CPAP therapy reporting less PTSD severity compared to those without access to CPAP.<sup>19</sup> While CPAP adherence may only moderately

affect PTSD severity, untreated OSA may be a barrier to successful PTSD treatment, thus requiring intervention prior to initiating treatment.<sup>20</sup> CPAP adherence has also been associated with improved sleep quality, daytime functioning, depression and quality of life in veterans,<sup>15,21,22</sup> as well as in active duty personnel.<sup>22</sup>

### Factors associated with CPAP non-adherence

Specific to psychiatric factors, being unable to adjust or relax while using CPAP has been identified as a common and repeating cause of non-adherence to CPAP.<sup>23</sup> Likewise, research indicates that patients experiencing difficulty with emotional reactions have a greater likelihood of non-adherence to their CPAP.<sup>24</sup> Patients have perceived claustrophobia as a major barrier to CPAP, with less than half of patients reporting that they would use CPAP if they felt less claustrophobic.<sup>25</sup> Consequently, claustrophobia has been associated with a greater risk of CPAP non-adherence.<sup>8,9,26</sup> As previously mentioned, individuals with other psychiatric comorbidities such as PTSD are also at increased risk for non-adherence compared to individuals without such comorbidities, and are likely to report claustrophobia and mask discomfort as reasons for non-adherence.<sup>4</sup> CPAP adherence was lower in PTSD veterans with OSA than veterans without PTSD. Excessive sleepiness predicted CPAP adherence, while frequent nightmares were correlated with poor adherence to CPAP therapy.<sup>4</sup>

### Interventions to increase adherence

Efforts to better understand the risk profile of non-adherence are important to optimising treatment effects.<sup>27,28</sup> However, research has not addressed what interventions are effective in people who find CPAP challenging, specifically patients with OSA with comorbid psychiatric disorders such as PTSD. As noted in some studies, education may improve adherence by helping patients with OSA develop confidence in their ability to use CPAP, identifying the benefits of CPAP use and decreasing the barriers to use. The previous studies do not include information about these interventions improving adherence among those with psychiatric comorbidities. Other research suggests that in addition to providing feedback and initial education to patients newly diagnosed with sleep apnoea, providing follow-up programs that include behavioural change and cognitive interventions can significantly increase adherence rates.<sup>29-31</sup>

Many studies have investigated the impact of cognitive-behavioural, motivational interviewing and/or enhancement-oriented interventions on CPAP adherence and compared these to either standard

care,<sup>29-31</sup> or time-matched placebo.<sup>32</sup> In reviewing educational, clinical support and behavioural change approaches aimed to improve CPAP adherence, Stepnowsky and colleagues (2013) found that most studies, on average, used a combination of four behavioural change techniques.<sup>33</sup> Furthermore, in both their review and a more recent Cochrane systematic review,<sup>34</sup> studies focusing on behavioural change were found to have higher effect sizes than either clinical or educational support approaches, highlighting the importance of integrating behavioural components into CPAP management programs.<sup>34</sup> This prospective study examined whether veterans diagnosed with OSA and a comorbid psychiatric disorder who participated in CPAP behavioural group treatment showed greater adherence to using their CPAP than veterans diagnosed with OSA and a comorbid anxiety disorder who did not participate in the CPAP behavioural group.

## Methods

### Participants

Veterans who received care through the Long Beach Veteran Affairs Healthcare system (LB-VAHCS) and were diagnosed with OSA and one or more comorbid psychiatric disorders were referred to attend six 90-minute weekly CPAP combined behavioural group sessions between 2016 to 2020. Participants were excluded if there was an additional diagnosis of restless leg syndrome (RLS) or if their polysomnogram showed evidence of periodic-limb movement disorder (PLMD). Those who attended some or all portions of the CPAP behavioural group treatment were included in the treatment group (n=92). A control group with characteristics similar to those in the treatment included veterans with an OSA diagnosis and a comorbid psychiatric diagnosis (n=305). A subset of veterans in the control group were referred to the group treatment but never attended or declined. Most participants were men (92%) and diagnosed with PTSD (64%).

### Procedure

This study was a retrospective chart review (RCR), also known as a medical chart review. OSA diagnosis was based on an overnight polysomnography sleep laboratory or using a home sleep oximetry recording. The types of CPAP machines were based on the sleep study, with the majority being overnight sleep studies that included a titration study (AKA split night sleep study). Additionally, most veterans in this study were placed on an autotitrating CPAP machine. All sleep study results were reviewed and validated by an AASM board-certified sleep specialist using an average number of incidents per hour (AHI)

equal to or greater than 5.0. Primary psychiatric diagnosis was based on a semi-structured mental health intake, informed consent to treatment/evaluation, and/or self-report measures (e.g., PCL5, GAD7, PHQ-9) to determine diagnostic status and functional impairment. Veterans were excluded if their sleep apnoea diagnostic status could not be confirmed or they did not have a psychiatric diagnosis in their medical chart. All procedures were approved by the LB-VAHCS Institutional Review Board/Office of Research and Development (Study ID 1618973-3).

### CPAP combined behavioural group treatment

The CPAP behavioural intervention was a 6-week, 90-minute, weekly group conducted at LB-VAHCS from 2016 to 2020. The treatment used the following therapeutic elements: psychoeducation, cognitive-behavioural therapy, systematic desensitisation and mindfulness intervention in a group setting. The group environment was important as it provided awareness and discussion among participants about real-world conditions they encountered while trying to adhere to CPAP treatment. Additionally, group dynamics in prior research suggest that peer support can encourage treatment adherence.<sup>35</sup> The group was open to any enrolled veteran at the LB-VAHCS who had OSA and mental health diagnoses or a psychiatric condition and were non-adherent with their CPAP treatment. Self-report from some of the recruited veterans, upon the referring provider asking qualifying questions and/or group leader prescreening the veteran, indicated that their underlying psychiatric disorder (e.g., PTSD, depression, anxiety disorder) or psychological issue (e.g., claustrophobia) was interfering with their adherence to CPAP treatment. The first group session focused on providing psychoeducation about sleep apnoea, the consequences of untreated OSA, treatment pros and cons and an overview of the desensitisation treatment protocol. The subsequent session focused on the relationship between anxiety and avoidance, desensitisation protocol, cognitive strategies and the practice of a mindfulness exercise. Each participant in the group constructed their own desensitisation hierarchy based on their subjective units of distress (SUD) profile. The remainder of the sessions focused on identifying and removing barriers, continued support with the completion of participants' exposure hierarchy, brief discussion of cognitions and ending group with a mindfulness exercise. The group modality allowed participants to share benefits received from CPAP use and concerns about real-world barriers, provided a supportive therapeutic environment and increased their self-efficacy. Please see Table 2 in Appendix for an outline of the treatment protocol.

## Variables

### Baseline characteristics

Patient age in years, body mass index (BMI), sex, race/ethnicity (Caucasian; Black; Asian; American Indian; Hispanic/Latino; other; mixed race), marital status (married; divorced/separated/widowed; single/never married), education level (high school graduate/GED or less; some college/associate degree; college graduate; some graduate school; graduate degree), comorbidities, apnoea-hypopnea index (AHI) and sleep efficiency (SE) were reported at baseline. The baseline AHI was calculated by dividing the number of apnoea and hypopnoea events by the number of hours of sleep. The baseline SE was a ratio calculated by dividing the time spent asleep by the total time spent in bed in minutes. Several psychiatric comorbidities included in the analysis include PTSD, depression and anxiety and unspecified. Other comorbidities include mild traumatic brain injury (mTBI) or post-concussion syndrome (PCS), hypertension, hyperlipidaemia and diabetes mellitus (DM). The total count of all comorbidities for each individual was also included as a proxy for general disease burden.

### Outcome measures

Adherence to CPAP usage was measured in two ways. First was the percentage of days of CPAP use in the past 30 days. The data included the duration of usage and recorded percentage compliance of CPAP use for more or less than 4 hours. We also constructed the total CPAP average use in minutes per day in the past 30 days as an alternative measure for adherence. Both outcome measurements were collected at baseline, 1 month, 3 months, 6 months, 1 year and 2 years post-treatment from each participant registered in the loud data (ResMed), where usage data were automatically synced from the CPAP machine to the Cloud daily.

### Analysis plan

Summary statistics were conducted to compare the baseline demographics and clinical characteristics of the treatment and control groups as well as their CPAP use compliance over time. Independent sample t-tests were conducted for the continuous variables and chi-square tests were conducted for the categorical variables. The grouping variable was participation in CPAP behavioural group treatment status. A multivariate linear regression model was performed on both outcome measures of CPAP adherence at five time points post-treatment ranging from 1 month to 2 years while controlling for treatment



Table 1. Summary statistics

Variables	n (%) or mean ± SD			
	Total (n=397)	Treatment (n=92)	Control (n=305)	P-value
BASELINE CHARACTERISTICS				
Age, y	53.5 ± 15.7	58.1 ± 13.1	52.1 ± 16.2	0.001
BMI	31.0 ± 6.1	32.7 ± 5.8	30.5 ± 6.1	0.002
Gender				0.291
Female	32 (8.0)	5 (5.4)	27 (8.8)	
Male	365 (92.0)	87 (94.6)	278 (91.2)	
Race/ethnicity				0.021
Caucasian	168 (42.3)	35 (38.0)	133 (43.6)	
Black	82 (20.7)	17 (18.5)	65 (21.3)	
Asian	38 (9.6)	6 (6.5)	32 (10.5)	
American Indian	3 (0.8)	2 (2.2)	1 (0.3)	
Hispanic/Latino	86 (21.7)	23 (25.0)	63 (20.7)	
Other	2 (0.5)	2 (2.2)	0 (0)	
Mixed race	18 (4.5)	7 (7.6)	11 (3.6)	
Marital status				0.16
Married	202 (50.9)	52 (56.5)	150 (49.2)	
Divorced/Separated/Wi	99 (25.0)	16 (17.4)	83 (27.2)	
Single/Never married	96 (24.2)	24 (26.1)	72 (23.6)	
Education				<0.001
High school grad/GED or less	150 (37.8)	17 (18.5)	133 (43.6)	
Some college/AA degree	155 (39.0)	35 (38.0)	120 (39.3)	
College graduate	59 (14.9)	24 (26.1)	35 (11.5)	
Some grad school	1 (0.3)	1 (1.1)	0 (0)	
Graduate degree	32 (8.1)	15 (16.3)	17 (5.6)	
PTSD, %	255 (64.2)	65 (70.7)	190 (62.3)	0.143
Depression, %	53 (13.4)	12 (13.0)	41 (13.4)	0.921
MDD, %	54 (13.6)	7 (7.6)	47 (15.4)	0.056
Anxiety, %	31 (7.8)	10 (10.9)	21 (6.9)	0.212
HTN, %	183 (46.4)	52 (56.5)	132 (43.3)	0.026
HLD, %	249 (62.7)	59 (64.1)	190 (62.3)	0.75
DM, %	89 (22.4)	29 (31.5)	60 (20.0)	0.017
mTBI or PCS, %	22 (5.5)	5 (5.4)	17 (5.6)	0.959
# total comorbidities	2.4 ± 1.0	2.6 ± 1.1	2.3 ± 1.0	0.012
AHI, %	31.1 ± 27.9	31.6 ± 21.9	31.0 ± 29.3	0.863
SE, %	76.3 ± 16.6	75.7 ± 15.2	76.4 ± 16.9	0.756
OUTCOME VARIABLES				
Compliance				
1 month	2.5 ± 12.6	8.4± 22.1	0.7 ± 6.8	<0.001
3 months	3.7 ± 15.0	12.1 ± 25.4	1.2 ± 8.6	<0.001
6 months	5.1 ± 17.8	13.3 ± 27.1	2.7 ± 12.8	<0.001
1 year	6.7 ± 21.6	14.6 ± 29.0	4.4 ± 18.3	<0.001
2 years	5.8 ± 21.3	9.7 ± 25.8	4.7 ± 19.6	0.045
Usage (minutes)				
1 month	10.1 ± 47.6	34.0 ± 81.9	2.9 ± 26.9	<0.001
3 months	16.0 ± 63.5	56.2 ± 113.0	3.8 ± 28.0	<0.001
6 months	24.5 ± 81.5	55.8 ± 113.0	15.1 ± 66.7	<0.001
1 year	31.4 ± 95.6	68.5 ± 125.6	20.2 ± 81.5	<0.001
2 years	26.1 ± 94.1	47.2 ± 115.0	19.8 ± 86.0	0.014

Note: Independent sample t-tests were conducted for the continuous variables and chi-square tests were conducted for the categorical variables. PTSD = post-traumatic stress disorder; MDD = major depressive disorder; HTN = hypertension; HLD = hyperlipidaemia; DM = diabetes mellitus; mTBI = mild traumatic brain injury; PCS = post-concussion syndrome; AHI = apnoea-hypopnea index; SE = sleep efficiency.

**Table 2. Multivariate linear regression results on percentage of CPAP use in past 30 days at multiple time points post-treatment**

VARIABLES	1-month	3-month	6-month	1-year	2-year
Treatment	7.220** (0.000)	11.75** (0.000)	11.27** (0.000)	9.202** (0.001)	5.040 (0.079)
Age, y	0.00205 (0.971)	0.0650 (0.330)	0.0395 (0.619)	0.259** (0.008)	0.199* (0.042)
BMI	0.0615 (0.576)	-0.0779 (0.551)	-0.0269 (0.863)	-0.132 (0.484)	-0.222 (0.246)
Male	0.464 (0.845)	-1.214 (0.668)	-3.321 (0.325)	-4.244 (0.299)	-2.656 (0.521)
<b>Race/ethnicity (RG=Caucasian)</b>					
Black	2.808 (0.095)	2.850 (0.154)	1.290 (0.587)	2.028 (0.481)	-0.0637 (0.983)
Asian	3.104 (0.192)	5.293 (0.061)	4.485 (0.183)	4.770 (0.242)	4.706 (0.254)
American Indian	-11.04 (0.150)	-8.228 (0.366)	-15.48 (0.154)	-16.61 (0.206)	2.478 (0.852)
Hispanic/Latino	2.721 (0.117)	2.310 (0.262)	-0.462 (0.850)	0.237 (0.936)	-3.570 (0.235)
Other	-7.329 (0.414)	-10.94 (0.306)	-14.44 (0.256)	-15.25 (0.322)	-12.90 (0.408)
Mixed race	0.402 (0.899)	-2.456 (0.515)	0.916 (0.838)	-0.732 (0.893)	6.018 (0.275)
<b>Marital status (RG=Married)</b>					
Divorced/Separated/Wi	-0.428 (0.785)	0.511 (0.784)	0.728 (0.743)	1.961 (0.466)	3.810 (0.163)
Single/Never married	-2.950 (0.086)	2.364 (0.247)	-1.244 (0.609)	-2.183 (0.458)	0.365 (0.902)
<b>Education (RG=High school grad/GED or less)</b>					
Some college/AA degree	1.236 (0.417)	-0.141 (0.938)	-2.923 (0.175)	-0.656 (0.801)	-0.697 (0.792)
College graduate	0.952 (0.638)	-2.206 (0.358)	-2.894 (0.312)	1.835 (0.596)	2.650 (0.450)
Some grad school	-2.071 (0.868)	-12.46 (0.402)	-12.46 (0.481)	-11.12 (0.604)	-12.10 (0.577)
Graduate degree	6.291* (0.015)	1.634 (0.594)	5.215 (0.153)	11.88** (0.007)	1.170 (0.794)
PTSD	-2.802 (0.244)	-0.489 (0.864)	-7.605* (0.026)	-9.462* (0.022)	2.819 (0.499)
Depression	-2.811 (0.377)	1.013 (0.789)	-8.839 (0.050)	-8.189 (0.134)	-0.0221 (0.997)
MDD	-1.541 (0.603)	-0.436 (0.902)	-6.761 (0.108)	-9.055 (0.075)	-1.669 (0.746)
HTN	0.902 (0.776)	1.891 (0.616)	-6.314 (0.160)	-9.409 (0.084)	-1.829 (0.740)
HLD	0.407 (0.888)	-0.490 (0.887)	-6.877 (0.095)	-7.943 (0.111)	0.453 (0.928)
DM	-1.450 (0.624)	0.109 (0.975)	-7.663 (0.068)	-10.85* (0.033)	-2.391 (0.641)
mTBI or PCS	-2.456 (0.503)	-0.304 (0.944)	-10.47* (0.044)	-5.476 (0.383)	0.309 (0.961)
# total comorbidities	0.365 (0.889)	-0.921 (0.768)	6.717 (0.072)	7.759 (0.086)	-0.436 (0.924)
Observations	397	397	397	397	397
R-squared	0.121	0.131	0.115	0.126	0.070

*P*-value in parentheses

\*\*  $p < 0.01$ , \*  $p < 0.05$ . PTSD = post-traumatic stress disorder; MDD = major depressive disorder; HTN = hypertension; HLD = hyperlipidaemia; DM = diabetes mellitus; mTBI = mild traumatic brain injury; PCS = post-concussion syndrome.

status, age, BMI, sex, race/ethnicity, marital status, education level and comorbidities. Data analysis was conducted by using Stata statistical software version 15.1.

## Results

Three-hundred and ninety-seven participants were included in the study sample, with 8% women and a mean age of  $53.5 \pm 15.7$  (Table 1). Caucasian/white patients accounted for 42.3% of the patient sample, followed by 21.7% Hispanic, 20.7% Black/African American and 9.6% Asian. About 23.2% of participants ( $n = 92$ ) received some or all portions of the CPAP combined behavioural group treatment. Both treatment and control groups had similar distributions in gender, marital status, depression and anxiety comorbidities. The majority of both groups were male, 94.6% in the treatment group and 91.2% in the control group. Half were married (57% in the treatment group and 49.2% in the control group). The treatment group, however, were older (58 vs 52 years old,  $p=0.001$ ), had a higher BMI (32.7 vs 30.5,  $p=0.002$ ), had a higher prevalence of hypertension and DM, and had a slightly higher number of total comorbidities (2.6 vs 2.3,  $p=0.012$ ). Baseline AHI and SE did not differ at baseline by treatment status. The mean  $\pm$  SD of AHI in the treatment group were  $31.6 \pm 21.9$  vs  $31.0 \pm 29.3$  in the control group ( $p=0.863$ ). In SE, the mean  $\pm$  SD was  $75.7 \pm 15.2$  in treatment vs  $76.4 \pm 16.9$  in control ( $p=0.756$ ). There was no CPAP usage in the past 30 days at baseline in either the treatment or control groups. Usage data was gathered from the CPAP Cloud. The absence of CPAP usage prior to group treatment was not intentional per group protocol. The unadjusted analysis showed that the treatment group consistently had a higher percentage of adherence and longer duration of CPAP usage at multiple follow-ups. Multivariate logistic regression results showed that adherence to CPAP within the past 30 days was significantly higher in the treatment group at 1 month, 3 months, 6 months and 1 year after treatment, compared to the control group (7.2, 11.8, 11.3 and 9.2 percentage points higher respectively, all  $p<0.001$ , Table 2). At 2 years post-treatment, the treatment group was still associated with a higher percentage of use and adherence, but the coefficient was no longer statistically significant. Older age predicted higher CPAP use at 1 and 2 years post-treatment. Compared to a high school diploma or less, a graduate degree was associated with higher CPAP adherence at 1 month and 1 year post-treatment. PTSD, DM and mTBI/PCS were associated with lower CPAP use at several time points post-treatment. Sex, race/ethnicity and marital status did not predict CPAP use.

Results from multivariate logistic regression on the outcome of total CPAP usage in minutes in the past 30 days showed similar results in that treatment was an independent and distinctive predictor of higher CPAP usage in minutes at all time points post-treatment (27 more minutes at 1 month, 55 at 3 months, 38 at 6 months, 46 at 1 year and 28 at 2 years, all  $p<0.05$ , Appendix Table 1).

## Discussion

The study confirmed that veterans with OSA and a comorbid PTSD diagnosis showed greater adherence to using their CPAP after receiving some or all portions of the combined CPAP behavioural group treatment than veterans with the same medical conditions who did not attend the combined CPAP behavioural group treatment. Specifically, the treatment group showed higher adherence to CPAP use at the 1-, 3-, 6- and 12-month marks than the control group. Findings of the present study are consistent with prior research suggesting that providing follow-up programs that include behavioural change and cognitive interventions can significantly increase adherence rates.<sup>27,36-40</sup> In contrast, comorbid mental health diagnoses (i.e., PTSD) were associated with lower adherence to CPAP use at the 6- and 12-month marks. Additionally, a mTBI /PCS or DM diagnosis was associated with significantly lower adherence rates at the 6- and 12-month marks, respectively. Also, the overall use of CPAP was low in both the treatment and control groups. Both of these findings are consistent with the literature since CPAP adherence is known to vary considerably among individuals and be lower among those with greater psychiatric symptomatology,<sup>41</sup> including military populations with PTSD.<sup>3,12</sup> The overall data suggest that the combined CPAP behavioural group treatment (i.e., initial education combined with desensitisation, cognitive interventions and mindfulness) plays a role in developing and maintaining CPAP adherence for veterans with OSA and psychiatric comorbidity. Additionally, our study suggests that although not all veterans in the treatment group attended all six treatment sessions, they generally still had better adherence than the control group.

## Limitations

More research is needed to elucidate the specific mechanisms underlying the combined behavioural group treatment regarding CPAP adherence, given the multiple ingredients involved in the intervention (i.e., cognitive, behavioural, motivational enhancement, desensitisation, education, mindfulness and group support). While the gender distribution of this study is on par with rates of sleep apnoea found in the

general population, gender-specific studies may be needed to see if there are differences in CPAP adherence or treatment outcome. Additionally, while this study examined the use of exposure-based interventions, future studies with randomised controlled trials, larger treatment sizes and long-term outcomes are needed. Moreover, other specific behavioural sleep conditions, such as RLS and periodic-limb movement disorders (PLMS), should also be researched. Furthermore, additional studies may need to focus on understanding age cohort differences in receptivity to CPAP adherence and treatment.

## Conclusion

This study was able to show that veterans with an OSA diagnosis and a comorbid psychiatric diagnosis, such as PTSD and/or depression, showed greater adherence to using their CPAP after receiving some or all portions of the combined CPAP behavioural group treatment than veterans with OSA and a comorbid psychiatric diagnosis who did not attend

the combined CPAP behavioural group treatment, with benefits lasting up to 12 months post-treatment. The study suggests that the combined CPAP behavioural group treatment (i.e., initial education combined with desensitisation, cognitive interventions and mindfulness) is associated with better CPAP adherence when underlying psychiatric disorders and/or medical conditions are present among veterans. As such, for veterans diagnosed with OSA and a comorbid psychiatric disorder such as PTSD and/or depression, a combined behavioural group treatment may be beneficial to include in a standard treatment set for such disorders.

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## References

1. Weaver, T. E., & Grunstein, R. R. (2008). Adherence to continuous positive airway pressure therapy: the challenge to effective treatment. *Proc Am Thorac Soc*, 5(2), 173-178. doi:10.1513/pats.200708-119MG
2. Means, M. K., & Edinger, J. D. (2011). Chapter 19 - Exposure Therapy for Claustrophobic Reactions to Continuous Positive Airway Pressure. In M. Perlis, M. Aloia, & B. Kuhn (Eds.), *Behavioral Treatments for Sleep Disorders* (pp. 183-193). San Diego: Academic Press.
3. Collen, J. F., Lettieri, C. J., & Hoffman, M. (2012). The impact of posttraumatic stress disorder on CPAP adherence in patients with obstructive sleep apnea. *J Clin Sleep Med*, 8(6), 667-672. doi:10.5664/jcsm.2260
4. El-Solh, A. A., Ayyar, L., Akinnusi, M., Relia, S., & Akinnusi, O. (2010). Positive airway pressure adherence in veterans with posttraumatic stress disorder. *Sleep*, 33(11), 1495-1500. doi:10.1093/sleep/33.11.1495
5. Lettieri, C. J., Williams, S. G., & Collen, J. F. (2016). OSA Syndrome and Posttraumatic Stress Disorder: Clinical Outcomes and Impact of Positive Airway Pressure Therapy. *Chest*, 149(2), 483-490. doi:10.1378/chest.15-0693
6. Zhang, Y., Weed, J. G., Ren, R., Tang, X., & Zhang, W. (2017). Prevalence of obstructive sleep apnea in patients with posttraumatic stress disorder and its impact on adherence to continuous positive airway pressure therapy: a meta-analysis. *Sleep Med*, 36, 125-132. doi:10.1016/j.sleep.2017.04.020
7. El-Solh, A. A., Adamo, D., & Kufel, T. (2018). Comorbid insomnia and sleep apnea in Veterans with post-traumatic stress disorder. *Sleep and Breathing*, 22(1), 23-31. doi:10.1007/s11325-017-1618-y
8. Chasens, E. R., Pack, A. I., Maislin, G., Dinges, D. F., & Weaver, T. E. (2005). Claustrophobia and adherence to CPAP treatment. *West J Nurs Res*, 27(3), 307-321. doi:10.1177/0193945904273283
9. Edmonds, J. C., Yang, H., King, T. S., Sawyer, D. A., Rizzo, A., & Sawyer, A. M. (2015). Claustrophobic tendencies and continuous positive airway pressure therapy non-adherence in adults with obstructive sleep apnea. *Heart Lung*, 44(2), 100-106. doi:10.1016/j.hrtlng.2015.01.002
10. Colvonen, P. J., Masino, T., Drummond, S. P., Myers, U. S., Angkaw, A. C., & Norman, S. B. (2015). Obstructive Sleep Apnea and Posttraumatic Stress Disorder among OEF/OIF/OND Veterans. *J Clin Sleep Med*, 11(5), 513-518. doi:10.5664/jcsm.4692



11. Creamer, J. L., Brock, M. S., Matsangas, P., Motamedi, V., & Mysliwiec, V. (2018). Nightmares in United States Military Personnel With Sleep Disturbances. *J Clin Sleep Med*, 14(3), 419-426. doi:10.5664/jcsm.6990
12. Gupta, M. A., & Simpson, F. C. (2015). Obstructive sleep apnea and psychiatric disorders: a systematic review. *J Clin Sleep Med*, 11(2), 165-175. doi:10.5664/jcsm.4466
13. Schulz, R. W. (2019). Comprehensive Sleep Apnea Screening in Veterans with Posttraumatic Stress Disorder. (Doctor of Nursing Practice Final Manuscript). University of San Diego, Retrieved from <https://digital.sandiego.edu/cgi/viewcontent.cgi?article=1108&context=dnpr>
14. El-Solh, A. A., Vermont, L., Homish, G. G., & Kufel, T. (2017). The effect of continuous positive airway pressure on post-traumatic stress disorder symptoms in veterans with post-traumatic stress disorder and obstructive sleep apnea: a prospective study. *Sleep Med*, 33, 145-150. doi:10.1016/j.sleep.2016.12.025
15. Orr, J. E., Smales, C., Alexander, T. H., Stepnowsky, C., Pillar, G., Malhotra, A., & Sarmiento, K. F. (2017). Treatment of OSA with CPAP Is Associated with Improvement in PTSD Symptoms among Veterans. *J Clin Sleep Med*, 13(1), 57-63. doi:10.5664/jcsm.6388
16. Tamanna, S., Parker, J. D., Lyons, J., & Ullah, M. I. (2014). The effect of continuous positive air pressure (CPAP) on nightmares in patients with posttraumatic stress disorder (PTSD) and obstructive sleep apnea (OSA). *J Clin Sleep Med*, 10(6), 631-636. doi:10.5664/jcsm.3786
17. Ullah, M. I., Campbell, D. G., Bhagat, R., Lyons, J. A., & Tamanna, S. (2017). Improving PTSD Symptoms and Preventing Progression of Subclinical PTSD to an Overt Disorder by Treating Comorbid OSA With CPAP. *J Clin Sleep Med*, 13(10), 1191-1198. doi:10.5664/jcsm.6770
18. Reist, C., Gory, A., & Hollifield, M. (2017). Sleep-Disordered Breathing Impact on Efficacy of Prolonged Exposure Therapy for Posttraumatic Stress Disorder. *J Trauma Stress*, 30(2), 186-189. doi:10.1002/jts.22168
19. Mesa, F., Dickstein, B. D., Wooten, V. D., & Chard, K. M. (2017). Response to Cognitive Processing Therapy in Veterans With and Without Obstructive Sleep Apnea. *J Trauma Stress*, 30(6), 646-655. doi:10.1002/jts.22245
20. Colvonen, P. J., Straus, L. D., Stepnowsky, C., McCarthy, M. J., Goldstein, L. A., & Norman, S. B. (2018). Recent Advancements in Treating Sleep Disorders in Co-Occurring PTSD. *Curr Psychiatry Rep*, 20(7), 48. doi:10.1007/s11920-018-0916-9
21. Gupta, M. A., Simpson, F. C., & Lyons, D. C. (2016). The effect of treating obstructive sleep apnea with positive airway pressure on depression and other subjective symptoms: A systematic review and meta-analysis. *Sleep Med Rev*, 28, 55-68. doi:10.1016/j.smrv.2015.07.002
22. Mysliwiec, V., Capaldi, V. F., 2nd, Gill, J., Baxter, T., O'Reilly, B. M., Matsangas, P., & Roth, B. J. (2015). Adherence to positive airway pressure therapy in U.S. military personnel with sleep apnea improves sleepiness, sleep quality, and depressive symptoms. *Mil Med*, 180(4), 475-482. doi:10.7205/milmed-d-14-00197
23. Aloia, M. S., Arnedt, J. T., Stepnowsky, C., Hecht, J., & Borrelli, B. (2005). Predicting treatment adherence in obstructive sleep apnea using principles of behavior change. *J Clin Sleep Med*, 1(4), 346-353.
24. Poulet, C., Veale, D., Arnol, N., Lévy, P., Pepin, J. L., & Tyrrell, J. (2009). Psychological variables as predictors of adherence to treatment by continuous positive airway pressure. *Sleep Med*, 10(9), 993-999. <https://doi.org/10.1016/j.sleep.2009.01.007>
25. Weaver, T. E., & Sawyer, A. M. (2010). Adherence to continuous positive airway pressure treatment for obstructive sleep apnoea: implications for future interventions. *Indian J Med Res*, 131, 245-258. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2972705/pdf/nihms246834.pdf>
26. Williams, S. G., Lettieri, C. J., & Dombrowsky, J. W. (2012). CPAP: enhancing its use. *Current Respiratory Care Reports*, 1(2), 131-138. doi:10.1007/s13665-012-0015-z
27. D'Rozario, A. L., Galgut, Y., & Bartlett, D. J. (2016). An Update on Behavioural Interventions for Improving Adherence with Continuous Positive Airway Pressure in Adults. *Current Sleep Medicine Reports*, 2(3), 166-179. doi:10.1007/s40675-016-0051-2

28. Sawyer, A. M., King, T. S., Weaver, T. E., Sawyer, D. A., Varrasse, M., Franks, J. Richards, K. C. (2019). A Tailored Intervention for PAP Adherence: The SCIP-PA Trial. *Behav Sleep Med*, 17(1), 49-69. doi:10.1080/15402002.2016.1276018
29. Aloia, M. S., Di Dio, L., Ilniczky, N., Perlis, M. L., Greenblatt, D. W., & Giles, D. E. (2001). Improving compliance with nasal CPAP and vigilance in older adults with OAHs. *Sleep Breath*, 5(1), 13-21. doi:10.1007/s11325-001-0013-9
30. Olsen, S., Smith, S. S., Oei, T. P., & Douglas, J. (2012). Motivational interviewing (MINT) improves continuous positive airway pressure (CPAP) acceptance and adherence: a randomized controlled trial. *J Consult Clin Psychol*, 80(1), 151-163. doi:10.1037/a0026302
31. Richards, D., Bartlett, D. J., Wong, K., Malouff, J., & Grunstein, R. R. (2007). Increased adherence to CPAP with a group cognitive behavioral treatment intervention: a randomized trial. *Sleep*, 30(5), 635-640. doi:10.1093/sleep/30.5.635
32. Aloia, M. S., Smith, K., Arnedt, J. T., Millman, R. P., Stanchina, M., Carlisle, C.,.... Borrelli, B. (2007). Brief behavioral therapies reduce early positive airway pressure discontinuation rates in sleep apnea syndrome: preliminary findings. *Behav Sleep Med*, 5(2), 89-104. doi:10.1080/15402000701190549
33. Stepnowsky, C., Zamora, T., Edwards, C., Liu, L., & Agha, Z. (2013). Interventions to Improve CPAP Adherence and Outcomes: Role of Theory and Behavioral Change Techniques. *Journal of Sleep Disorders & Therapy*, 2(133), 2167-0277. doi:10.4172/2167-0277.1000133
34. Wozniak, D. R., Lasserson, T. J., & Smith, I. (2014). Educational, supportive and behavioural interventions to improve usage of continuous positive airway pressure machines in adults with obstructive sleep apnoea. *Cochrane Database Syst Rev*(1), Cd007736. doi:10.1002/14651858.CD007736.pub2
35. Yalom, I. D., Leszcz, M. (2020). *The Theory and Practice of Group Psychotherapy*, 6th ed. New York, Basic Books
36. Bakker, J. P., Weaver, T. E., Parthasarathy, S., & Aloia, M. S. (2019). Adherence to CPAP: What Should We Be Aiming For, and How Can We Get There? *Chest*, 155(6), 1272-1287. doi:10.1016/j.chest.2019.01.012
37. Chaiard, J., & Weaver, T. E. (2019). Update on Research and Practices in Major Sleep Disorders: Part I. Obstructive Sleep Apnea Syndrome. *Journal of Nursing Scholarship*, 51(5), 500-508. <https://doi.org/10.1111/jnu.12489>
38. D'Rozario, A. L., Galgut, Y., Crawford, M. R., & Bartlett, D. J. (2021). Summary and Update on Behavioral Interventions for Improving Adherence with Positive Airway Pressure Treatment in Adults. *Sleep Medicine Clinics*, 16(1), 101-124.
39. Sunwoo, B. Y., Light, M., & Malhotra, A. (2020). Strategies to augment adherence in the management of sleep-disordered breathing. *Respirology*, 25(4), 363-371. doi:10.1111/resp.13589
40. Weaver, T. E. (2019). Novel Aspects of CPAP Treatment and Interventions to Improve CPAP Adherence. *J Clin Med*, 8(12). doi:10.3390/jcm8122220
41. Means, M. K., & Edinger, J. D. (2007). Graded exposure therapy for addressing claustrophobic reactions to continuous positive airway pressure: a case series report. *Behav Sleep Med*, 5(2), 105-116. doi:10.1080/15402000701190572

## Appendix

**Table 1. Multivariate linear regression results on the total minutes of CPAP use in past 30 days at multiple time points post-treatment**

VARIABLES	1 month	3 months	6 months	1 year	2 years
Treatment	27.23** (0.000)	54.76** (0.000)	37.99** (0.000)	45.92** (0.000)	28.29* (0.026)
Age, y	-0.0821 (0.698)	0.149 (0.591)	0.0949 (0.796)	0.942* (0.028)	0.812 (0.060)
BMI	0.358 (0.389)	-0.199 (0.714)	0.283 (0.694)	-0.689 (0.412)	-0.929 (0.271)
Male	-3.299 (0.713)	-13.03 (0.267)	-14.59 (0.350)	-21.99 (0.226)	-19.14 (0.295)
<b>Race/ethnicity (RG=Caucasian)</b>					
Black	7.671 (0.226)	7.693 (0.353)	10.94 (0.320)	10.06 (0.432)	-0.844 (0.948)
Asian	3.311 (0.711)	16.77 (0.152)	1.534 (0.921)	10.21 (0.573)	19.57 (0.283)
American Indian	-43.63 (0.131)	-36.56 (0.333)	-62.15 (0.216)	-71.82 (0.219)	22.11 (0.707)
Hispanic/Latino	9.097 (0.164)	12.29 (0.150)	2.908 (0.798)	-0.621 (0.962)	-17.78 (0.181)
Other	-29.68 (0.381)	-50.37 (0.255)	-51.26 (0.383)	-79.60 (0.246)	-61.68 (0.370)
Mixed race	6.698 (0.576)	-12.09 (0.440)	12.12 (0.560)	7.527 (0.756)	2.710 (0.911)
<b>Marital status (RG=Married)</b>					
Divorced/Separated/Wi	-5.701 (0.336)	-0.530 (0.945)	-2.892 (0.779)	10.63 (0.375)	14.70 (0.223)
Single/Never married	-8.801 (0.174)	9.888 (0.242)	1.550 (0.890)	-0.320 (0.980)	4.107 (0.755)
<b>Education (RG=High school grad/GED or less)</b>					
Some college/AA degree	5.693 (0.321)	-1.871 (0.803)	-18.00 (0.071)	-13.01 (0.263)	-6.710 (0.565)
College graduate	7.347 (0.335)	-2.475 (0.804)	-6.011 (0.650)	1.395 (0.928)	8.464 (0.585)
Some grad School	-16.20 (0.731)	-60.51 (0.326)	-56.19 (0.493)	-70.12 (0.462)	-62.95 (0.511)
Graduate degree	22.35* (0.022)	0.961 (0.940)	11.88 (0.482)	40.45* (0.040)	-1.351 (0.946)
PTSD	-9.840 (0.278)	10.09 (0.394)	-31.24* (0.048)	-30.48 (0.097)	16.44 (0.373)
Depression	-17.51 (0.144)	12.62 (0.421)	-43.09* (0.039)	-38.05 (0.117)	-2.620 (0.914)
MDD	-8.280 (0.459)	10.97 (0.453)	-36.28 (0.062)	-32.75 (0.148)	-10.51 (0.644)
HTN	2.232 (0.852)	25.80 (0.100)	-12.67 (0.542)	-40.09 (0.098)	-0.933 (0.969)
HLD	-1.376 (0.900)	8.282 (0.562)	-34.08 (0.074)	-41.96 (0.059)	1.163 (0.958)
DM	-1.304 (0.907)	21.18 (0.146)	-20.24 (0.296)	-39.05 (0.084)	-8.164 (0.719)
mTBI or PCS	-13.50 (0.328)	3.172 (0.860)	-44.95 (0.062)	-20.60 (0.461)	-2.543 (0.928)
# total comorbidities	4.091 (0.680)	-16.83 (0.194)	25.74 (0.135)	32.49 (0.106)	-3.487 (0.863)
Observations	397	397	397	397	397
R-squared	0.127	0.161	0.099	0.112	0.075

P-value in parentheses

\*\*  $p < 0.01$ , \*  $p < 0.05$ . PTSD = post-traumatic stress disorder; MDD = major depressive disorder; HTN = hypertension; HLD = hyperlipidaemia; DM = diabetes mellitus; mTBI = mild traumatic brain injury; PCS = post-concussion syndrome.

Table 2. Overview of combined behavioural group treatment chart

Session	Group elements
Session 1 (90 mins)	<ul style="list-style-type: none"> <li>• Psychoeducation               <ul style="list-style-type: none"> <li>- Adds motivational enhancement</li> <li>- Pros/cons</li> <li>- Identified barriers</li> <li>- Brief group discussions</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• CPAP desensitisation protocol               <ul style="list-style-type: none"> <li>- Counterconditioning, gradual exposure</li> <li>- Classical Conditioning</li> <li>- Automatic nervous system SNS vs PSN</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• CBT               <ul style="list-style-type: none"> <li>- Myths</li> <li>- CBT cognitive strategies (e.g., reframing)</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Relaxation exercise</li> </ul>
	<ul style="list-style-type: none"> <li>• Homework:               <ul style="list-style-type: none"> <li>- Review pros/cons</li> <li>- Practice relaxation exercise</li> <li>- Read CPAP handouts</li> </ul> </li> </ul>
Session 2 (90 mins)	<ul style="list-style-type: none"> <li>• Brief recap of prior session</li> <li>• Follow up with homework               <ul style="list-style-type: none"> <li>- Discussed barriers/problems</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Develop each person's CPAP hierarchy/Review of SUD</li> <li>• Assigned hierarchy step               <ul style="list-style-type: none"> <li>- Discussed barriers/problems</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Discussed any cognitive concerns</li> </ul>
	<ul style="list-style-type: none"> <li>• Relaxation exercises</li> </ul>
	<ul style="list-style-type: none"> <li>• Homework               <ul style="list-style-type: none"> <li>- Do hierarchy step</li> <li>- Practice relaxation exercise</li> <li>- Read CPAP handouts</li> </ul> </li> </ul>
Session 3 -5 (90 mins)	<ul style="list-style-type: none"> <li>• Brief recap of prior session</li> <li>• Follow up with homework               <ul style="list-style-type: none"> <li>- Discussed barriers/problems</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Reviewed and developed each person's CPAP hierarchy/Review of SUD               <ul style="list-style-type: none"> <li>- Assigned hierarchy step</li> <li>- Discussed barriers</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Discussed any cognitive concerns</li> </ul>
	<ul style="list-style-type: none"> <li>• Relaxation exercises</li> </ul>
	<ul style="list-style-type: none"> <li>• Homework               <ul style="list-style-type: none"> <li>- Do hierarchy step</li> <li>- Practice relaxation exercise</li> <li>- Read CPAP handouts</li> </ul> </li> </ul>
Session 6 (90 mins)	<ul style="list-style-type: none"> <li>• Brief recap of prior session</li> <li>• Follow up with homework               <ul style="list-style-type: none"> <li>- Discussed barriers/problems</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Reviewed and developed each person's CPAP hierarchy/Review of SUD               <ul style="list-style-type: none"> <li>- Assigned hierarchy step</li> <li>- Discussed barriers</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Discussed any cognitive concerns</li> </ul>
	<ul style="list-style-type: none"> <li>• Reviewed progress made</li> </ul>
	<ul style="list-style-type: none"> <li>• Reviewed and developed each person's CPAP hierarchy/Review of SUD               <ul style="list-style-type: none"> <li>- Assigned hierarchy step</li> <li>- Discussed barriers</li> </ul> </li> <li>• Assigned homework and how veterans can continue on their own</li> </ul>
	<ul style="list-style-type: none"> <li>• Termination and aftercare issues</li> </ul>



# Military Medical Student Experiences during a Prolonged Casualty Care Simulation

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## Introduction

Prolonged Casualty Care (PCC) (previously prolonged field care [PFC]) refers to patient care over a prolonged time in an austere environment where evacuation is not possible.<sup>1, 2</sup> Prolonged Casualty Care education is driven by the United States Military Joint Trauma System's Prolonged Casualty Care (PCC) guidelines, which are a 'consolidated list of casualty-centric knowledge, skills, and best practices intended to serve as the DoD baseline clinical practice guidance to guide casualty management over a prolonged amount of time in austere, remote, or expeditionary settings, and/or during long-distance movements'.<sup>3, 4</sup>

Specialised training in PCC is critical for military medical students, as the concepts and skills required for effective PCC apply to a variety of unexpected scenarios.<sup>2, 5, 6</sup> For example, in future military conflicts, there is an anticipated reliance on PCC with delayed medical evacuation times secondary to large areas of operations and challenges operating in semi- and non-permissive environments.<sup>6</sup>

One education modality for teaching PCC is simulation, which has been shown to develop medical student skills, confidence, decision-making abilities and professional identity.<sup>7</sup> During simulation training, medical students are immersed in a realistic environment where they practice their medical skills in a safe learning space.<sup>8</sup> Students feel free to learn from their mistakes without the concern of harming the patient, while simultaneously receiving constant guidance and feedback from experienced faculty members.<sup>8, 9</sup> Furthermore, simulation training has proven valuable for identifying gaps in student skills where further education may be needed.<sup>10</sup>

This simulation was conducted at a military medical school in the United States and is the only known PCC simulation in undergraduate military medical education. Operation Gunpowder is a two-day military medical simulation held at a National Guard Training Center at Fort Indiantown Gap, PA. The practicum reviews Tactical Casualty Combat Care

(TCCC) and then exposes learners to the necessary concepts and practices of delivering PCC, including performing Forward Resuscitative Care (FRC), Forward Resuscitative Surgical Care (FRSC), and Patient Movement (PM) while providing En-Route Care (see Appendix A for course objectives).

During the simulation, the third-year medical students in our study underwent a small-team, mobile and tactical deployment with limited resources in an austere environment. They received hands-on experience with simulated patients and cutsuits as they transported their patients by vehicle and simulated aircraft, working as a team to move the patients safely from one stage of care to the next. The simulation was run by a team of interdisciplinary faculty, including physicians, physician assistants, certified nurse anaesthetists, medics and corpsmen, all with significant operational experience. Throughout the simulation, as little notionalisation as possible is utilised. For example, medication bottles were pre-labelled, and students were required to calculate, draw up and administer medication to a simulated patient. Additionally, students were required to assemble the correct equipment to set up a Walking Blood Bank (WBB).

Deeply rooted in the PCC principles published in the recent JTS PCC Clinical Practice Guideline (CPG), Operation Gunpowder took students from the Casualty Collection Point (CCP) to the Role 4 hospital in five phases: 1) CCP/Tactical Field Care; 2) Role 1/PCC; 3) Ground CASEVAC/En-Route Care; 4) Role 2/FRSC; 5) Air Evacuation En-Route Care (see Table 1).

## Rationale

Past studies have explored the impact of simulation on undergraduate medical student learning as a whole.<sup>7, 8</sup> In addition, past research has advocated for using simulation to teach PCC to emergency medicine residents.<sup>2</sup> However, no research has focused specifically on how simulation helps undergraduate military medical students learn how to conduct PCC,

**Table 1. Five phases of Operation Gunpowder PCC simulation**

<b>Phase 1-</b> Casualty Collection Point (CCP) /Tactical Field Care	Students began the scenario at the CCP where they encountered a patient with traumatic wounds secondary to an explosion. Students were required to perform Tactical Combat Casualty Care (TCCC). Working as a team, students transferred their patient to a safe location and established a Role 1.
<b>Phase 2-</b> Role 1/ Prolonged Casualty Care (PCC)	As Gunpowder's focus is PCC, most of the practicum was spent in Phase 2. At the safe house, the students encountered a second patient who was critical. In this phase, the students performed comprehensive histories and physical examinations, completed additional life-saving procedures, and recorded and trended vital signs while creating nursing care plans. The students were also given access to teleconsultation, where additional faculty (intensivists) were integrated. During this phase, the students were also responsible for implementing teamwork/rest cycles.
<b>Phase 3-</b> Ground CASEVAC/ En-Route Care	Patients were transported via ground CASEVAC, where the students were required to prepare and transport their casualties safely.
<b>Phase 4-</b> Role 2/ Forward Resuscitative Care & Forward Resuscitative Surgical Care	The students arrived at a Role 2 facility where they were exposed to the concepts and practices of Forward Resuscitative Care and Forward Surgical Care. They practised operating ventilators and learned the role of surgeons and anaesthesiologists in stabilising patients for transport to definitive treatment.
<b>Phase 5-</b> Air CASEVAC En-Route Care	The students transported their patients into a simulated V-22 Osprey helicopter (a box truck) while they performed En-Route Care. On arrival, the students transferred their patients to the receiving medical team.

a vital training area for future deployments.<sup>2, 11</sup> To fill this research gap, this qualitative study aimed to explore the experiences of third-year military medical students during Operation Gunpowder.

## Materials and methods

### Design

Our research team used a qualitative phenomenological design to explore the experiences of third-year medical students attending Operation Gunpowder during Spring 2022.<sup>12</sup> A total of 163 students attended Operation Gunpowder in Spring 2022. We emailed all the attendees, asking them to volunteer for our study. Of the 163 students, 35 volunteered to participate in the study. We asked each volunteer participant the same questions from the interview protocol. There are no rules or calculations regarding sample size in qualitative research design.<sup>13</sup> Rather, after reviewing the interview transcripts, we determined that no additional follow-up data collection or participant recruitment was needed because saturation had been reached. Phenomenology explores the essence of the participants' experiences during a particular phenomenon, which in this case is Operation Gunpowder, to gain an in-depth understanding of these experiences.<sup>12, 14</sup> Qualitative research design provides in-depth insight into one particular case that can be applied to other cases in a variety of other settings.<sup>15</sup> Therefore, in this study, our insight into the students' learning experiences at Operation Gunpowder can be extrapolated to other military medical education and training venues.

### Data collection

To investigate students' learning experiences at Operation Gunpowder, we interviewed the participants before the start of Operation Gunpowder and at the conclusion of Operation Gunpowder. Each student was interviewed twice using open-ended questions (see Appendix B for the Interview Guide). The interviews occurred within two days of each other. The Institutional Review Board approved this study at the authors' medical school.

### Data analysis

Our research team closely followed the steps of phenomenological data analysis to analyse our data.<sup>16</sup> We first transcribed the interviews using an automated transcription service. Next, each research team member individually coded the deidentified data, noting statements throughout the interview transcripts that directly illustrated the students' learning experiences at Operation Gunpowder. Next, we met as a research team to discuss the codes, categorise these codes, and organise these categories into themes. After engaging in discussion, we agreed on how to define each theme. Any disagreements or differences in viewpoints between team members about this organisation and categorisation process were resolved through open discussion until we reached a consensus among team members about the study results. We took detailed notes during these meetings to document this consensus process.<sup>17</sup> To report our findings in the results section of this manuscript, we used a composite description of the themes, with illustrative quotes as supportive

evidence to articulate the essence of the participants' common experiences.

### Strategies to increase the trustworthiness of our results

We used several strategies to increase the credibility of our study's results. First, we interviewed each participant twice to gain an in-depth understanding of their experiences, otherwise known as prolonged engagement.<sup>18</sup> We also used member checking, in which we emailed the interview transcripts back to the participants after the second interview so they could edit or add any necessary information from both interviews.<sup>19</sup> Finally, we used a research team to analyse the data, bringing multiple perspectives to the data analysis process.<sup>20</sup> Our research team independently coded the data and then collectively agreed on the emerging themes, which served as the study's results. Our research team also discussed our biases and how we were bracketing these biases throughout the data analysis process.<sup>21</sup> For example, as faculty members and medical students at the university conducting the simulation, we were inherently inclined to assume its value for student learning. However, as directed by the professional qualitative research design literature, we openly discussed this bias and collectively worked to ensure it was not influencing our interpretation of the participants' experiences.<sup>21</sup>

## Results

The following themes emerged from our data regarding the students' learning during Operation Gunpowder. The students 1) benefited from hands-on learning, 2) learned how to navigate the unpredictable and stressful nature of the operational environment, and 3) developed leadership skills and abilities.

### Benefited from hands-on learning

The participants first described Operation Gunpowder's experiential learning environment, comparing the hands-on environment to the traditional classroom. One student differentiated between the two teaching modalities. *Actually applying a tourniquet, actually trying to do a cric, actually doing those things. It takes a skill that you're not just going to get from watching videos and from listening to lectures. (P 26).* Another student compared the depth of each learning approach. *There's just so much more that we can learn in the field. You don't learn until you're 'doing'. It's not like I don't have the knowledge, it's just I don't know how it's applied, what it looks like. (P18).*

The students also commented on the hands-on learning environment at Operation Gunpowder. *Nothing replaces actually getting out there and doing it and being down your knees, and slipping in with blood in your hands, and trying to get an actual IV in. Trying to get tourniquets on, trying to do a cric or put in a chest tube. (P22).* Another participant described how practising their skills in a simulated operational environment provided them with more realistic learning aligned with their future operational landscapes. *Anyone can read a book and read a definition and then spit it back out. But yeah, running up on a patient and sliding down that hill that's wet and then putting on a tourniquet... that's different. (P1).*

### Navigated the operational environment

As a result of their hands-on experiences at Gunpowder, the students described the lessons they learned from practising PCC in an unpredictable and stressful operational environment. First, they learned how to navigate the unknown. For example, one participant recalled that *on route to a checkpoint, we got a casualty and we had to stop and treat them. We weren't expecting it at all. We weren't ready and had to improvise. (P29).* Another described a change in mindset. She learned to constantly think about contingency planning, *you're MacGyvering things and coming up with creative solutions in the moment. I feel like that's not something I've been pushed to do at other points in my medical training so far, so I think that it was definitely a very steep and good learning curve. (P10).*

Next, the students learned how to handle the stress of providing PCC in the operational environment, especially when transporting patients. *We moved the patient four times and the IV fell out. Everything is loud, everything is cold, your patient is like, losing heat, getting worse if you don't pay attention to every single thing that's going on. So it just gives you a bigger picture of what's going on and how you have to look at every little piece. (P32).* Another student credited the stressful environment with facilitating his professional growth and development. *I think it was good to create a stressful environment because... it shows your gaps or weaknesses and better do that in a training environment versus a real deal experience. (P5).*

In addition to learning how to navigate unpredictable and stressful circumstances, the students navigated a resource-limited environment common to the operational environments they will practice medicine on future deployments. One described the importance of innovation while practising PCC in

an operational environment with limited resources. *You've got to get creative, using whatever resources you do have, trying to make it work. (P5).* Another student emphasised the importance of innovation and creativity for problem solving.

*The amount of supplies was always a problem, you know, by the time you get to prolonged field care, you're like, 'Oh, s— I'm out of blood, I'm out of crystalloid alright, we've used all our tourniquets'....We needed to put a catheter in someone, a Foley catheter, we didn't have one. We had the tubing for it, but we had to figure out how to improvise a bag for it out of an old IV bag we had used and emptied....and realized like, Oh, okay, there's so many different things I can do to think outside the box and accomplish my mission right now. (P22).*

Because of the resource-constrained environment at Operation Gunpowder, the students gained a newfound understanding of telemedicine's value in helping them treat their patients in an austere, resource-limited environment. For most, Operation Gunpowder was the first time they used telemedicine, and they found comfort in it. *I thought it was soothing. It was like, even just like having her on the phone, like made me feel better. Like, it was like, there's another pair of eyes on this who's like not in this. (P2).* Another student's increased comfort level increased her confidence in practising PCC in an operational environment. *It was really neat that you could not know something and still get help, which would increase my confidence level in going out just because you're not alone. (P26).*

One student described the benefits of using telemedicine to gain an additional perspective about how to treat a patient. *One of our patients had signs of elevated intracranial pressure and we didn't have hypertonic saline or supplies needed to treat that. We did a telemedicine consult who was able to help us dose Keppra that we had in our packs and weren't thinking about using. (P20).* After practising telemedicine at Operation Gunpowder, the students extended the benefits of telemedicine to their future work in the field. *I think that it has revolutionised the ability to care for soldiers because if you're in the field and in an austere environment, we've got like a TBI patient, we can consult. Or, if we've got an X-ray in the field, and we don't know what's going on, we can consult radiology (P7).*

### Developed leadership skills and abilities

In the complex operational environment, the students described how Operation Gunpowder

helped them to better understand the complexities of leadership in the operational environment. One student discussed the need to see the big picture as a leader. *Transitioning from just being a doctor and focusing on one patient, like taking a step back, looking at the entire situation and thinking about more than just the patient. (P11).* When serving as a team leader for the first time, another student realised the need to intentionally take a step back so that she could see the big picture.

*It was really hard to find that right balance, being involved enough to know what was going on with each of our team's patients, but also staying far back enough to not get bogged down. Like bogged down and then miss something that was happening, but trusting my teammates, "Okay, they've got this. I just need to supervise, and fill in where it is needed, or help redirect", even though that's difficult as a med student 'cause you're like, "I should be there doing the hands-on stuff that we are being trained to do." (P31)*

In addition to gaining insight into the leadership role during PCC, the students recognised the importance of the followership role for successful team dynamics. One described the importance of *always being willing to just take a step back, be the follower when you're needed and then be the leader when it's time. (P13).* Another explained the benefits of the follower role for enhancing team dynamics. *Sometimes it makes sense to be a follower...Seeing my fellow med students think through the process and following their lead, and following their instruction...and trusting them. (P27).*

As a result of these leadership and followership experiences, the students realised their potential as leaders. One described how he was *out of my comfort zone, but it absolutely increased my confidence. I am definitely more confident in my leadership ability. I felt myself being more vocal and willing to take that role. (P4).* Another described how his confidence in his leadership abilities increased after stepping into a leadership role at Gunpowder. *Gunpowder made me aware that I'm not always the most comfortable stepping up into a leadership position, but also helped me to recognize it's not usually as bad as you think it's going to be. (P21).*

### Discussion

Students' perceptions are essential for determining the value of a learning environment.<sup>22-25</sup> The students in our study described their experiences at a high-fidelity simulation, Operation Gunpowder. Overall, they discussed how the simulation-based learning experience increased their medical skills, ability to



navigate the operational environment's unpredictable stressors and conceptualisation of leadership.

PCC is an important focus area for research and training to effectively prepare military physicians for future combat operations in far-forward, resource-limited environments.<sup>1,2</sup> As best practices and models for PCC continue to be researched and developed, both medical education and military leadership need to know how to effectively teach these best practices to medical students and military medical officers in the field so that they are ready and able to care for patients in the evolving landscapes of the operational environment.

The results of our study likewise align with the past studies in the medical education literature that prove the benefits of simulation-based education for student learning.<sup>7, 26</sup> We extended these results to a simulated PCC scenario as our students described the value of a high-fidelity simulation for learning PCC. To expand on this initial study, we plan to gather quantitative data measuring the impact of Operation Gunpowder on students' skill performance using a pretest-post-test design.

Telemedicine is another important area of future research and training for military physicians conducting PCC in austere and resource-limited environments.<sup>6</sup> The students in our study expounded on telemedicine's benefits for future use in the field. As technology develops and the potential to use telemedicine in the field increases significantly,<sup>27</sup> it is crucial for military medical educators to continue to develop best practices like Operation Gunpowder for training future military physicians to effectively use and maximise the benefits of telemedicine in the operational environment.

## References

1. Mould-Millman NK, Keenan S, Dixon J, Steyn E, Lategan HJ, de Vries S, et al. An Innovative Civilian Research Model to Inform Combat-Relevant Prolonged Casualty Care. *Med J (Ft Sam Houst Tex)*. 2022;Per 22-04-05-06(Per 22-04-05-06):62-72.
2. Eker J, Hiller H, Hill G, Brillhart D, Hannick V. Preparing Emergency Physicians for the Next War: Residency Capstone Training in Prolonged Casualty Care. *Med J (Ft Sam Houst Tex)*. 2022(Per 22-04/05/06):10-6.
3. Shackelford SA, Gurney JM, Taylor AL, Keenan S, Corley JB, Cunningham CW, et al. Joint Trauma System, Defense Committee on Trauma, and Armed Services Blood Program consensus statement on whole blood. *Transfusion*. 2021;61 Suppl 1:S333-s5.
4. System JT. Prolonged Casualty Care Guidelines 2021. Available from: [https://jts.amedd.army.mil/assets/docs/cpgs/Prolonged Casualty Care Guidelines 21 Dec 2021 ID91.pdf](https://jts.amedd.army.mil/assets/docs/cpgs/Prolonged_Casualty_Care_Guidelines_21_Dec_2021_ID91.pdf).
5. Callaway DW. Translating Tactical Combat Casualty Care Lessons Learned to the High-Threat Civilian Setting: Tactical Emergency Casualty Care and the Hartford Consensus. *Wilderness Environ Med*. 2017;28(2s):S140-s5.
6. Lesperance RN, Adamson S, Gurney JM. Lessons Learned During Prolonged Care of Combat Casualties by a Minimally Manned Surgical Team. *Military Medicine*. 2021.

## Limitations

This study's results were limited to one cohort of students from one university. In addition, we only explored the experiences of 35 students. Future large-scale quantitative research might examine the learning experiences of all 163 students participating in Operation Gunpowder and determine the impact of the simulation on their learning and performance.

## Conclusion

The participants in our study described how the high-fidelity simulation challenged their existing medical knowledge and skills helped them identify areas for future professional development. The third-year medical students also described how Operation Gunpowder developed leadership abilities necessary for their roles as military medical officers.

## Disclaimer

The opinions and assertions expressed herein are those of the authors and do not reflect the official policy or position of the US Army, the US Navy, the Uniformed Services University of the Health Sciences, or the Department of Defense.

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7. Ma IWY, Brindle ME, Ronksley PE, Lorenzetti DL, Sauve RS, Ghali WA. Use of Simulation-Based Education to Improve Outcomes of Central Venous Catheterization: A Systematic Review and Meta-Analysis. *Academic Medicine*. 2011;86(9):1137-47.
8. Al-Elq AH. Simulation-based medical teaching and learning. *J Family Community Med*. 2010;17(1):35-40.
9. Schroedl CJ, Corbridge TC, Cohen ER, Fakhraan SS, Schimmel D, McGaghie WC, et al. Use of simulation-based education to improve resident learning and patient care in the medical intensive care unit: a randomized trial. *J Crit Care*. 2012;27(2):219.e7-13.
10. Tamás É, Södersved Källestedt M-L, Hult H, Karlgren K, Allvin R. Closing the Gap: Experienced Simulation Educators' Role and Impact on Everyday Health Care. *J Contin Educ Health Prof*. 2019;39(1):36-41.
11. Cole R, Rudinsky S, Conley SP, Vojta L, Wook Kwon S, Garrigan AG, et al. The Impact of Medical School on Military Physicians' Readiness for their First Deployment. *Military Medicine*. 2022.
12. Patton MQ. *Qualitative research and evaluation methods*: Sage; 2002.
13. Hennink M, Kaiser BN. Sample sizes for saturation in qualitative research: A systematic review of empirical tests. *Social Science & Medicine*. 2022;292:114523.
14. Creswell JWP, C.N.. *Qualitative inquiry research and design: Choosing among five approaches*: Sage; 2018.
15. Merriam SBT, E.J. *Qualitative research: A guide to design and implementation*. 4th ed2016.
16. Groenewald T. A Phenomenological Research Design Illustrated. *International Journal of Qualitative Methods*. 2004;3(1):42-55.
17. Ye WQW, Rietze BA, McQueen S, Zhang K, Quilty LC, Wickens CM. Barriers to Accessing Mental Health Support Services in Undergraduate Medical Training: A Multicenter, Qualitative Study. *Academic Medicine*. 2023;98(4):491-6.
18. Morse JM. Critical Analysis of Strategies for Determining Rigor in Qualitative Inquiry. *Qual Health Res*. 2015;25(9):1212-22.
19. Birt L, Scott S, Cavers D, Campbell C, Walter F. Member Checking: A Tool to Enhance Trustworthiness or Merely a Nod to Validation? *Qualitative Health Research*. 2016;26(13):1802-11.
20. Fernald DH, Duclos CW. Enhance your team-based qualitative research. *Ann Fam Med*. 2005;3(4):360-4.
21. Barrett A, Kajamaa A, Johnston J. How to be reflexive when conducting qualitative research. *Clin Teach*. 2020;17(1):9-12.
22. Dicker R, Garcia M, Kelly A, Mulrooney H. What does 'quality' in higher education mean? Perceptions of staff, students and employers. *Studies in higher education (Dorchester-on-Thames)*. 2019;44(8):1425-41.
23. Hill Y, Lomas L, MacGregor J. Students' perceptions of quality in higher education. *Quality Assurance in Education*. 2003;11(1):15-20.
24. Akareem HS, Hossain SS. Determinants of education quality: what makes students' perception different? *Open Review of Educational Research*. 2016;3(1):52-67.
25. Mukharyamova LM, Zhidyaevskij AG, Tokranova KP. The Quality of Higher Medical Education: Students' Perceptions and Assessments. *Integratsiia obrazovaniia = Integration of education*. 2020;24(2):235-51.
26. Chernikova O, Heitzmann N, Stadler M, Holzberger D, Seidel T, Fischer F. Simulation-Based Learning in Higher Education: A Meta-Analysis. *Review of Educational Research*. 2020;90(4):499-541.
27. Nettesheim N, Powell D, Vasios W, Mbuthia J, Davis K, Yourk D, et al. Telemedical Support for Military Medicine. *Military Medicine*. 2018;183(11-12):e462-e70.

## Appendix A. Course Objectives

By the conclusion of MFP 201: Operation Gunpowder, students will be able to do the following:

### **Military Medical Leadership:**

1. Demonstrate a high standard of professionalism
2. Contextually discriminate effective and ineffective leadership behaviours in a small-team and squad-level environments
3. Using Troop Leading Procedures, effectively lead a small medical team in an isolated, austere, and resource-constrained environment
4. Demonstrate Leader-Follower Framework principles of leadership on a squad level

### **Military Medical Practice:**

1. Describe medical support challenges within special operations and other far-forward small units
2. Create Prolonged Casualty Care and En-Route Care contingency plans
3. Demonstrate appropriate casualty preparation for air and ground evacuation in a simulated situation
4. Outline unique En-Route Care considerations regarding the environment and Patient Movement
5. Perform equipment class-VIII inventory in order to support Prolonged Casualty Care

### **Military Field Medicine:**

1. Demonstrate Tactical Combat Casualty Care knowledge and skills consistent with current guidelines, with simulated combat casualties in a field setting
2. Participate in the performance of critical care resuscitation skills, including hemorrhage control, vascular access, and airway management, with simulated medical and trauma patients in a Prolonged Casualty Care scenario
3. Demonstrate the ability to recognize and manage a patient in hemorrhagic shock
4. Demonstrate the ability to recognize and manage a patient in septic shock
5. Demonstrate the ability to recognize and manage a patient in respiratory failure
6. Demonstrate critical care best practices, including resuscitation, pain management, and nursing skills with simulated patients in a Prolonged Casualty Care scenario
7. Defend the collection and use of fresh whole blood for patient resuscitation in a field environment
8. As a team, execute appropriate telemedicine consultation to optimize care of patients in a Prolonged Casualty Care scenario
9. Outline Forward Resuscitative Surgical Care capabilities of a Role-2 Light Maneuver unit or team
10. Explain the concepts, principles, and intended outcomes of damage control resuscitation and damage control surgery
11. Recommend appropriate transitions of patient care, including verbal hand-off and written documentation to another provider

### Appendix B. Interview guide

#### **Interview 1:**

What are your expectations for Operation Gunpowder?

Do you feel prepared for Operation Gunpowder?

What goals have you set for yourself?

What do you think you will learn at Operation Gunpowder?

How would you describe Tactical Field Care?

How would you describe Prolonged Casualty Care?

How would you describe Forward Resuscitative Care and Forward Resuscitative Surgical Care?

How would you describe En-Route Care?

How will you utilize prolonged field care in the future?

Why is Prolonged Casualty Care important?

How will you utilize telemedicine in your future work as a MMO?

How would you describe the role of the Military Medical Officer (MMO)?

How confident do you feel in your readiness for your first deployment, on a scale of 1-10?

#### **Interview 2:**

What was the most memorable part of Operation Gunpowder?

What goals did you accomplish?

How did Gunpowder affect your medical skills?

How did Gunpowder affect your leadership abilities?

How would you describe Tactical Field Care?

How would you describe Prolonged Casualty Care?

How would you describe Forward Resuscitative Care and Forward Resuscitative Surgical Care?

How would you describe En-Route Care?

How will you utilize prolonged field care in the future?

Why is Prolonged Casualty Care important?

How will you utilize telemedicine in your future work as a MMO?

How would you describe the role of the Military Medical Officer (MMO)?

How confident do you feel in your readiness for your first deployment, on a scale of 1-10?



# Book Review of *Aging Veteran With Disabilities: A Cross-National Study of Policies and Challenges*

R. Yi

*Aging Veterans with Disabilities: A Cross-National Study of Policies and Challenges*

By Arie Rimmerman. 2022. Abingdon, New York, Routledge. 144 pages. ISBN 9780367564506 (pbk)

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*'I can't stand it to think my life is going so fast and I'm not really living it.'*

Ernest Hemingway, *The Sun Also Rises*

In military and veteran health studies, much has been written about general health issues and policy measures to support veterans who encounter life-challenging physical conditions. However, a review of existing literature reveals three main gaps: (1) the aging experiences of veterans with disabilities; (2) the physical health, psychological wellbeing and cognitive wellness of veterans, particularly those challenged by spinal cord injuries (SCI) and PTSD; and (3) institutional and social policy measures to support older veterans across different demographic locations.

With an overall aim to bridge the existing gaps in knowledge, *Aging Veterans with Disabilities: A Cross-National Study of Policies and Challenges* focuses on veterans who were wounded in World War II, the Korean War and the Vietnam War, as well as current health and social policy measures, legislations and institutional framework in three countries, the United States, the United Kingdom and Israel.

Aging with a disability refers to 'individuals who age with a physical, mental, or cognitive disability acquired in early or mid-life' (p. 33). Built on this central conception, this monograph discusses specific policy considerations supporting veterans with disabilities. Chapter 1 introduces the past and present policy schemes for veterans with disabilities, policy concerns and future directions. In particular, this chapter provides an overview of the compensation and benefits in recognition of the

unique contributions made by war veterans. Chapter 2 provides the conceptual models, propositions and evidence for successful and accelerated aging exemplified by SCI and PTSD. These theory bases include lifespan theories and activity, disengagement and continuity theories. Chapter 3 concentrates on the unmet needs of aging veterans with disabilities, particularly their health and psychosocial needs. Chapter 4 examines government policies from a multi-stakeholder perspective. The policy areas discussed in this chapter include priority health and social care services, personalised and dedicated care services, retirement, pension and social security provisions, and geriatric and extended care options in institutional and non-institutional settings. Chapters 5 and 6 provide policy recommendations and insights for policymakers.

Overall, the monograph contributes to the existing literature on three fronts: (1) a holistic and systematic understanding of the physical, cognitive and psychosocial wellbeing of veterans with disabilities acquired in later life stages; (2) a rich evidence-based approach in the analysis and evaluation of veteran health in the nexus of welfare and warfare; and (3) mutual learning of institutional policies and practices, such as nation-specific compensation, pension and medical benefits in support of ageing veteran with disabilities.

Regardless of all perceived political, ideological, institutional, geographical or sociocultural differences, veterans deserve our respect for their services and contributions to their country. Veterans embody many cherished human qualities—deep loyalty, discipline and resilience. Veterans' spirit profoundly influences how their descendants navigate the world and will always be a source of strength and inspiration for future generations. As a proud granddaughter of a commander and a personnel officer, I inherited these highly-regarded human qualities through my upbringing. Most importantly, I sense the profound calling to strive for a world of peace in which human beings are treated fairly and have the opportunity to take proper care of

their family, community and society. This monograph gives due respect and much-needed attention to the unmet needs of veterans with disabilities. However, more lessons can be drawn from policy measures and cases from other countries in the Global South. This monograph can help address current issues in veteran health policies.

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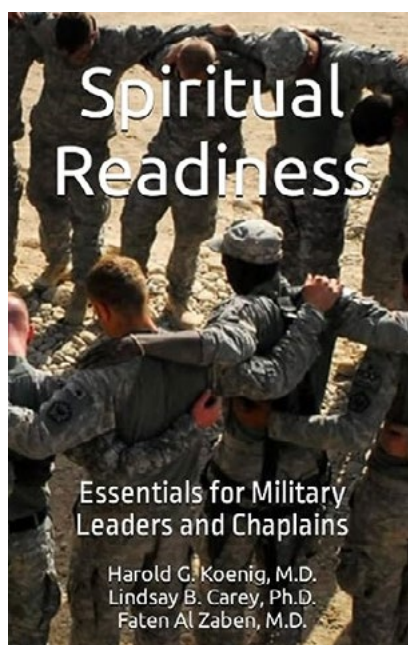
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# Book Review of *Spiritual Readiness: Essentials for Military Leaders and Chaplains*

D. Cronshaw



*Spiritual Readiness: Essentials for Military Leaders and Chaplains*

by Harold G. Koenig, Lindsay B. Carey & Faten Al Zaben  
New York. Amazon Books, 2022, ISBN: 9798840830093 (e-book).

Reviewed by Darren Cronshaw

Modern psychology and contemporary militaries now recognise what ancient religions and philosophies have long known—that there is an important spiritual aspect to life and death. This book considers research into spirituality, health and fitness and how that relates to the readiness of military members: their spiritual readiness.

Some of the problems of why members are not deployable or most effective relate to mental health, substance abuse, relationship struggles, PTSD and moral injury. For American and Australian readers, one strength of the book is that it utilises some key descriptive statistics of the US Armed Forces and the Australian Defence Force about these issues. It is

well illustrated with a variety of treatment programs used in these contexts. The US Department of Defense partly sponsored the book as a resource for chaplains and military leaders to help recognise the importance of and develop the capability enhancer of spiritual readiness. It examines spiritual readiness as part of human flourishing and how religion or spirituality affects the physical, social, behavioural and physical domains of spiritual readiness.

The three writers are experts in this field Dr Harold Koenig is Director of the Center for Spirituality, Theology and Health and Professor of Psychiatry and Behavioral Sciences at Duke University Medical Center. He was co-leader of the 2022 Professional Development Training Course (PDTC) for the US Navy, Marine Corps and Coast Guard, designed to build and sustain spiritual readiness in preparation for combat operations. Dr Lindsay Carey is an Associate Professor (Adjunct) with the School of Psychology and Public Health and the Centre for Ethics and Society at the University of Notre Dame (Sydney). He is also a Wing Commander Senior Research Chaplain with ADF Joint Health Command and was co-awarded the Sir Edward Weary Dunlop Award (2019) for research into moral injury. Dr Faten Al Zaben is an Associate Professor and division chief of psychiatry at King Abdulaziz University in Saudi Arabia and has an extensive research background in medicine and public health, including mental health and moral injury.

The writers acknowledge that military members can derive inspiration for values, meaning and purpose from non-religious sources. However, these are spiritual in the broader sense. The call to sacrifice, working for the greater good, fostering good character, mindfulness and meditation practices, and having a sense of horizontal transcendence in fighting for your mates are aspects of spiritual readiness that many people of any religion or none can draw upon. Some philosophies can foster spiritual readiness, such as Stoicism and its focus on character building and what we can control by not complaining.

Moreover, the authors suggest to followers of a religion that there is a particular utility in identifying the resources of their faith. For example, Christian, Jewish and Muslim believers have practices that help them seek guidance in prayer, reduce anxiety from trusting God, and pray for strength and endurance. Eastern religions of Confucianism, Taoism and Shintoism elevate righteous living, and good character, and often idealise non-violence and non-retaliation. Indic faiths of Hinduism, Buddhism and Sikhism each have their own distinct beliefs and practices. For example, there are a number of Sikh soldiers in my unit. I was curious to learn about their meditation and prayer bead practices, and how these help with a sense of wholeness and relief of anxiety, as well as guidance for a life of service.

As well as detailing the beliefs and practices of these different religions as they undergird spiritual readiness, the text evaluates religion-specific therapy manuals and interventions for anxiety, depression, moral injury and PTSD. For example, one of the programs assessed is Pastoral Narrative Disclosure (PND) as part of moral injury skills training (MIST) that ADF chaplains are utilising with an important reliance on ritual and restoration. These are resources chaplains particularly may draw on. Still, they are also essential for leaders, that is policymakers, commanders, therapists and medical providers.

So what is 'spiritual readiness'? The Navy Chaplains Corp defines it as 'the strength of spirit that enables the war-fighter to accomplish the mission with honor' (pp. 57–58). Other definitions and various measurements are offered, such as the Spiritual Fitness Inventory (SFI) and Spiritual Attitudes Inventory (SAI), as well as models for developing it, such as the Holistic Health and Fitness (H2F) System.

There are, of course, concerns about promoting religion in a secular society. Yet the experience of fear, discouragement, despair, doubt, temptation and guilt are arguably universal. Spiritual resources tailored to an individual, including recognition of

their religion, can address these experiences and help reduce depression, suicide, substance abuse problems, and inappropriate anger and aggression. Moreover, spiritual readiness can help prepare military members for surviving and returning home healthy in mind and soul from combat, as the authors conclude:

*History has demonstrated that providing warriors with the most powerful munitions platforms, weapon systems, and technology is often not enough to win wars. They must also have the strength of spirit (and will power) to accomplish their duties with honor, which will help them not only succeed in these military endeavors but also avoid the devastating inner conflicts that might otherwise result. (p. 231)*

As the authors wisely suggest, it can also help ameliorate the revenge and hate in an adversary that can tragically re-ignite future conflicts.

*Spiritual Readiness* is an accessible but thoroughly researched manual on understanding and cultivating the all-too-often neglected spiritual health of soldiers for the sake of their fighting effective missions and guarding their souls.

*The views expressed in this article are those of the author and do not necessarily reflect the position of the Australian Army, the Department of Defence or the Australian Government.*

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# Gastrointestinal Mortality in Military / Prison Camps of the 19th-20th Centuries

G D Shanks

## Abstract

Military prison camps have historically been terrible places with excessive mortality. A review of extant records from the 19th to the 20th century indicates that gastrointestinal mortality dominated in both cold weather and tropical prison camps. Malnutrition and gastrointestinal infections became mutually re-enforcing causes of mortality in prison camps, including Andersonville, Georgia, during the US Civil War, French prisons in Guyana and New Caledonia, British colonial government of India prisons in the Andaman Islands, Finnish and Japanese prisoner of war (POW) camps during World War II and US camps for Chinese/Korean POW during the Korean War. Overall mortality ranged from 6% to 33%, with a majority due to diarrhoea and dysentery. Crowded camps with poor sanitation and inadequate water supplies were the worst in terms of survival. Historical horror stories are in danger of repetition during modern crises if simple field sanitation cannot be instituted and maintained.

*As these waters, loaded with filth and human excrement, flow sluggishly through the swamp below, filled with trees and reeds, coated with a filthy deposit, they emit an intolerable and most sickening stench.*

Dr Joseph Jones 1865<sup>1</sup>

Military prison camps with crowded and unsanitary conditions have often become focal points of increased mortality due to diarrhoea and dysentery. This has been especially true for prisoner of war (POW) camps, which were overcrowded with surrendered personnel forced into a bare existence with inadequate food and water supplies. That this existed during the US Civil War in 1864 is not historically surprising as it was before the understanding of the microbiological nature of infectious diseases. Still, similar dysfunctional camps with lethal consequences existed well into the 20th century. Disease disasters during armed conflict and refugee movements could reoccur today if basic principles of field hygiene are ignored. The ancient Roman Army understood that latrines and mess facilities needed to be physically separated within the camp, even if they did not understand anything about bacterial contamination of food and water sources. Historical examples from the USA, French, British, Finnish and Japanese military experiences regarding prisoner mortality due to gastrointestinal infections are reviewed.<sup>2,3,4,5,6,7</sup> The selection of examples largely depended on those historical instances with extant data in English. Mortality risk primarily reflected logistical issues of crowding, poor nutrition, unsafe water sources and inadequate field sanitation.

Most soldiers during the US Civil War died of infections, not combat. 'Did not have the guts to be a soldier' originally referred to the gastrointestinal tract, not any perceived act of cowardice.<sup>8</sup> The Confederate prison camp at Andersonville, Georgia, was the worst example of what could happen when previous government-sponsored parole agreements broke down, supplies fell short due to the Union shipping blockade and medicine was incredibly basic due to scientific ignorance.<sup>9</sup> Figure 1 indicates the exceedingly crowded conditions in the POW camp with primitive field hygiene facilities. It is estimated that 13 000 of 45 000 Union prisoners (28%) died at Andersonville, mostly over 14 months 1864–65.<sup>10</sup> Hospital and burial records indicate that the vast majority of deaths were due to malnutrition (vitamin deficiencies such as scurvy) and diarrhoeal infections.<sup>1, 10</sup> Figure 2 show the estimates of causes of death in the Andersonville prison camp. Dr Joseph Jones, the military medical officer who investigated the mortality crisis for the Confederacy, knew that the primary problem was the halt in prisoner exchanges due to political disagreements and the inadequacy of supplies due to the Union blockade.<sup>1</sup> These harsh wartime realities did not stop post-war accusations of war crimes, eventually leading to the execution of the Andersonville camp commandant.<sup>1</sup>

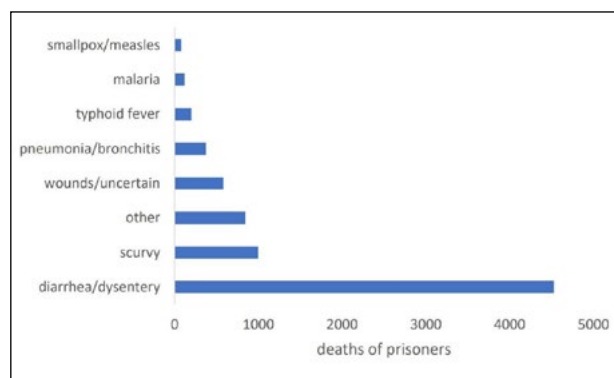


**Figure 1:** Photo of USA Union Army soldiers at the Andersonville, Georgia prison camp showing the crowded conditions under improvised shelters with field latrines (sinks) in the foreground that led to thousands of prisoner deaths due to gastrointestinal infection. Photo by AJ Riddle in 1864 via the National Parks Service (<https://www.nps.gov/media/photo/gallery-item.htm>). Now in the public domain.

Crowding large numbers of prisoners into a small area without clean water or field sanitation was a disaster that extracted an enormous mortality tax on the prisoners.

Not all prison camps were for POW; France sent civilian convicts to colonial prisons in both Guyana in South America and New Caledonia in the Pacific in the latter half of the 19th century. Despite the similarities between the prisoners exiled overseas and the general conditions of servitude in French camps, the mortality rates in the two prison colonies were very different. Malaria and yellow fever were endemic in Guyana and absent from New Caledonia. Between 1–3% of prisoners died annually of diarrhoea or dysentery<sup>3</sup> (see Figure 3). Diarrhoeal deaths were much higher in New Caledonia from midcentury despite the overall mortality being 50% greater in Guyana due to the additional infectious disease burden primarily due to malaria. For comparison, dysentery mortality rates from the British colonial government of India's prison camps on the Andaman Islands are included in Figure 3 as another area with endemic malaria.<sup>5</sup> By 1880, all three prison camps' diarrhoeal disease mortality rates had moderated, likely due to efforts to improve field hygiene and faecal disposal practices.<sup>3, 5</sup> Diarrhoeal diseases and subsequent mortality were always worse when the camps were being organised or after a large influx of new prisoners likely due to inability to have field sanitation and water facilities ready from the beginning.

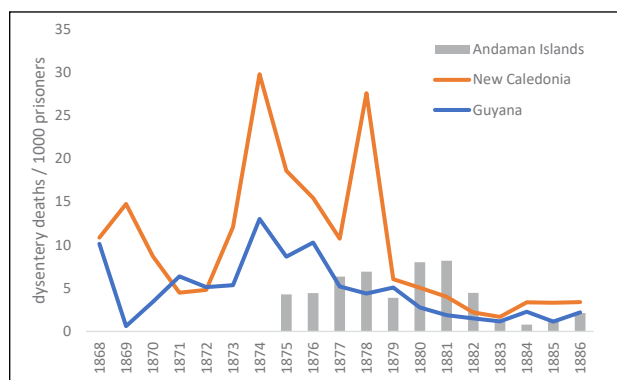
World War I had several examples of prison camp mortality due to gastrointestinal disease. The Australian Imperial Force at Gallipoli was little more



**Figure 2:** Causes of death of USA Union Army soldiers at the Andersonville, Georgia prison camp in 1864–65 based on reports of Confederate medical officers working at the prison hospital and post-war burial records. 13 000 (28%) of the 45 000 Union soldiers confined at Andersonville died largely of gastrointestinal infections and malnutrition.<sup>1, 9, 10</sup>

than an open prison camp, given the limitations of space, lack of fresh water and poor sanitation facilities during a siege inside a small coastal enclave encircled by the Turkish Army. Dysentery and diarrhoea were the leading infectious disease problems of Gallipoli, requiring many to be evacuated to Malta in the preantibiotic era.<sup>11</sup> Over a quarter of a million Italian POW were captured just after a single battle (Caporetto) in 1917, forming part of >600 000 Italian POW incarcerated by the Austro-Hungarian Empire.<sup>12</sup> Diarrhoeal disease was the leading cause of death, with an estimated 17% of captured soldiers not surviving the war. However, detailed quantitation across the main camps was unavailable.

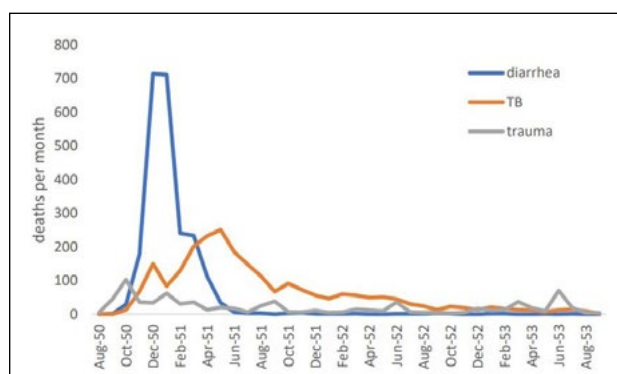
POW camps during World War II included the infamous camps of Allied prisoners along the Thai–Burma railway 1942–45, where most deaths resulted from a combination of malnutrition (beriberi), diarrhoeal diseases and malaria.<sup>4, 13</sup> Cholera epidemics killed many along the railway in 1943.<sup>14</sup> Roughly 1:4 of the 60 000 POW did not survive the war, with the leading listed cause of death was dysentery.<sup>15</sup> A valuable comparison to what was experienced on the Thai–Burma railway can be made with Soviet POW and civilians held in Finnish camps during 1939–44, where about 1:3 of the 64 000 prisoners did not survive the war<sup>6</sup> (see Figure 4). This was despite the ethnic Russians in Finland not being involved in forced labour projects. Malnutrition (largely starvation) and diarrhoeal diseases were the leading causes of death. The added complication of severe cold during winter was another significant loss of calories in addition to the war-restricted food supplies.<sup>6</sup> Malaria was present but not a major cause of death.<sup>16</sup> Cold temperatures may have limited the



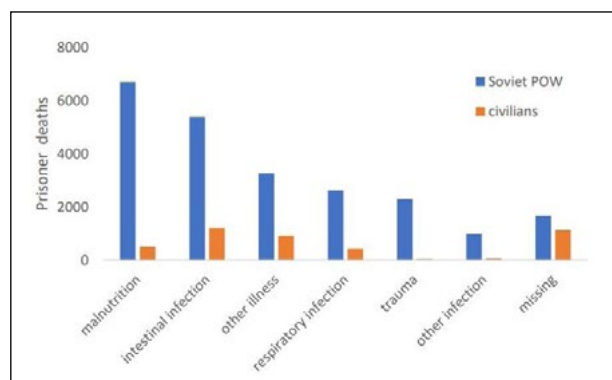
**Figure 3: Dysentery mortality rates in French civilian prisoners at camps in Guyana and New Caledonia 1868–1886 based on French medical officers' reports.<sup>3</sup> Similar information from the British colonial government of India prison camps on the Andaman Islands 1875–1886 with dysentery mortality is shown for comparison.<sup>5</sup>**

spread of enteric infections seasonally. Still, the overall death rates due to diarrhoeal diseases were high, with moderation over the course of the war. Differentiation between malnutrition, malabsorption and enteric infection was impossible as these were largely symptomatically indistinguishable and likely formed a spectrum of disease manifestations.<sup>6</sup>

One can expect acute health problems anytime a large population of unwilling prisoners without much understanding of field sanitation are rapidly collected into POW camps. This occurred in the aftermath of the Chinese People's Liberation Army intervention during the Korean War 1950–53.<sup>7</sup> Relatively few Chinese/Korean prisoners died in US POW camps, with a mortality rate of 5.8% out of 132 474 registered POW administered in camps controlled by the USA military.<sup>7</sup> Dysentery (likely *Shigellosis*) was the leading killer in 1950, even after the advent of the antibiotic era (see Figure 5). Tuberculosis reactivation was an important secondary cause of



**Figure 5: Deaths in US prison camps during the Korean War 1950–53 in Korean/Chinese POW (total=132 474), of which 5.8% died in captivity mostly of gastrointestinal causes and reactivation tuberculosis.<sup>7</sup>**



**Figure 4: Causes of death in Russian (Soviet) POW and civilian internees in Finland during the winter and Continuation Wars of 1939–1944. Approximately one-third of Russian prisoners captured in Finland (total=64 000) did not survive the war, most dying of gastrointestinal infections and malnutrition.<sup>6</sup>**

death that prevailed after diarrhoeal diseases had been controlled by better POW administration and camp management.<sup>7</sup> The Korean War POW experience is essential in pointing out that even well-resourced military groups can have difficulty managing field sanitation in large numbers of POW camps.

Although there is a tendency to see such prison camp mortality crises as a dark and distant history, continuing armed conflicts in parts of the developing world suggest otherwise. The Rwandan War of 1994 and the associated genocide produced large numbers of refugees in what was then known as Zaire (now Democratic Republic of the Congo). Although the initial concern focused on a cholera epidemic, drug-resistant *Shigella dysenteriae* was the cause of many deaths in the Goma refugee camps.<sup>17</sup> The campsite consisted mainly of a lava field with no natural water sources, which only complicated the sudden need to provide field sanitation for more than a million people. In future Humanitarian and Disaster Relief (HADR) missions that the Australian Defence Force may be tasked to respond to minimise mortality, it is essential to get basic field sanitation done correctly at the beginning of the crisis.<sup>11</sup> There are distinct limitations to using historical casualty data derived under the stress of war and disaster, so one has to realise the approximate nature of the recorded information. Although cultural practices apply in different civilian or military populations, the practical medical need to separate food, water and faeces leaves some non-negotiable factors that must be solved in field sanitation when large numbers of people are suddenly confined in camp areas. Current military medical officers must recognise the difficulties of field sanitation during future wars and humanitarian disaster relief missions.

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## References

1. Jones J, 1867. A report of the diseases among the prisoners at Andersonville, GA. Flint A, ed. Sanitary memoirs of the War of the Rebellion New York: US Sanitary Commission, 483-599.
2. Woodward JJ, Smart C, Otis GA, Huntington DL, 1879. The Medical and Surgical History of the War of the Rebellion (1861-65): pt. 1. Medical history: US Government Printing Office.
3. Kermorgant A, 1903. Morbidite et mortalite des transportes et des relegates en Guyane et en Nouvelle-Caledonie. Annales d'hygiene et de medicine coloniales. 6:159-174.
4. Reid J, Wilson T, 1947. Report on Nutrition and Discussion of the Main Causes of Death, "F" Force, Thailand. Journal of the Royal Army Medical Corps. 89:149-65.
5. Shanks GD, Hay SI, Bradley DJ, 2008. Malaria's indirect contribution to all-cause mortality in the Andaman Islands during the colonial era. Lancet Infect Dis. 8(9):564-570.
6. Westerlund L, 2008. Prisoners of War Deaths and People Handed over to Germany and the Soviet Union in 1939-1955: A research report by the Finnish National Archives. Oy Nord Print Ab: Helsinki.
7. Lee M-S, Kang M-J, Huh S, 2013. Causes of death of prisoners of war during the Korean War (1950-1953). Yonsei medical journal. 54(2):480-488.
8. Erickson RL, The historic role of military preventive medicine and public health in US armies of occupation and military government. Military Preventive Medicine: Mobilization and Deployment. 1: 59-77.
9. Woodward JJ, 1863. Outlines of the Chief Camp Diseases of the United States Armies: As Observed During the Present War. Philadelphia: J B Lippincott.
10. Atwater D, 1866. A list of the Union Soldiers buried at Andersonville: copied from the Official Record in the Surgeon's Office at Andersonville. New York: Tribune association.
11. Shanks GD, 2023. War-related dysentery epidemics in the Australian Army. J Military Veterans' Health.
12. Sabbatini S, Fiorino S, Manfredi R, 2020. The destiny of Italian prisoners in Austro-Hungarian POW camps during the First World War: remembering the defeat of Caporetto 100 years on. Infections in the History of Medicine. 1;28(1):108-124.
13. Dunlop EE, 1946. Medical experiences in Japanese captivity. BMJ. 2(4474):481.
14. Shanks GD, 2022. Military aspects of cholera in POW / Refugee Camps. J Military Veterans' Health. 30(1):85-9.
15. Walker A, 1963. The Burma-Thailand Railway. Middle East and Far East. Canberra, Australia: Australian War Memorial.
16. Huldén L, Huldén L, 2008. Dynamics of positional warfare malaria: Finland and Korea compared. Malaria J. 7(171): 1-13.
17. Kerneis S, Guerin PJ, von Seidlein L, Legros D, Grais RF, 2009. A look back at an ongoing problem: Shigella dysenteriae type 1 epidemics in refugee settings in Central Africa (1993-1995). PloS One. 4(2):e4494.



### "Ramping Up" - The Future for RAAF Health PIET at HOCU

FLTLT Diane Casey<sup>1</sup>, FLTLT Jessica Besley<sup>1</sup>

<sup>1</sup> Royal Australian Air Force

Health Operational Conversion Unit (HOCU) is the sole provider for Air Force Health training through the conduct of Post Initial Employment Training (PIET) courses, delivered to all Air Force health personnel. Noting all clinicians graduate from their chosen studies with the necessary skills to perform their clinical duties, HOCU courses focus on a processed-based training approach to ensure conversion to Air Force Health specific capability and qualifications.

HOCU's course structure has evolved and adapted to keep pace with the ADF's changing geopolitical environment. Recent campaigns have identified the need to move at short notice with little to no preparation time and we need to increase our preparedness as unrest moves closer to our shores. The Defence Strategic Review 2023, encourages "change with a managed but focussed sense of urgency" aligning with HOCU's 2022 multi-tiered approach to course changes implemented over the past twelve months.

HOCU reassessed and restructured our content and training delivery both in the Learning Management Packages (LMP), which govern the course content and structure; as well as in the delivery methods and duration of courses. Changing the LMP's required extensive reviews and approvals to ensure the course objectives were still being met and were able to be delivered by the best and most efficient means possible.

2023 has seen HOCU "ramp up" to deliver all new course formats, content and integrated training. Course durations have also been tailored to better support the training delivery and enabling personnel to be released from units to attend courses. All courses now incorporate non-permissive environment training with students wearing body armour and carrying weapons in their "tactical" phases of each course. They are taught to operate within their health roles in a simulated area of increased threat. This ensures that if they are to deploy at short notice to an area of heightened threat, it will not be their first time wearing and using body armour with weapons, all whilst conducting their duties. These phases of the course also integrate other squadrons for mutually beneficial force generation and training. Aviation Security Operators from No. 1 Security Force are integrated into the Aeromedical Evacuation Teams, and Airfield Defence Guards are incorporated into Operational Health Support Course to provide

security and assist with the Mass Casualty scenario training.

We have had to be creative and flexible in how we delivered the course content, often having to pivot to accommodate live aircraft or other external elements. During the COVID-19 pandemic, courses were heavily impacted and even cancelled due to border restrictions with aircraft. Out of this, we identified the need to be able to conduct training on C-130J aircraft in some form, from Amberley. This is the only platform not accessible without either going to Richmond or having a live aircraft flown to Amberley. As a result, HOCU decided to build our own C-130J training aid (Part-Task Trainer). This C-130J Part Task Trainer can be configured, with real aircraft parts, to mimic two patient bays for aeromedical evacuation. It will also enable 3AMES to conduct operational scenario training on the C-130J for all of their personnel, including reservists. This training aid also runs in conjunction with the augmented reality project from Real Response to be able to simulate patient treatment within a live aircraft environment.

In summary, this presentation will dive into more detail of the changes to HOCU courses with the addition of supporting imagery and further context and background.

#### Biography:

*FLTLT Diane Casey joined the RAAF in 1998 as a Medical Assistant before completing her Bachelor of Nursing and commissioning to a Nursing Officer in 2011. FLTLT Casey has had an extensive career across a multitude of postings (1EHS, 2EHS, 3AMES & HOCU). She has deployed to East Timor (UNTAET), Middle East (OP Slipper & OP Accordion) and to OP Highroad (AELO Afghanistan). She has participated in many domestic and international exercises, including Pacific Angel 16, Bersama Lima 18 and Mobility Guardian 19.*

*FLTLT Jessica Besley joined the RAAF as a direct entry Nursing Officer in March 2015. She completed her Bachelor of Nursing from the University of Tasmania in January 2012 before moving to Sydney as a Registered Nurse. She has been posted to 2EHS (Darwin), 3AMES (Amberley) and currently HOCU since 2021. She has also deployed to the Middle East (OP Accordion) and OP Highroad (AELO Afghanistan) plus OP Covid Assist 2022. She has been a part of many exercises both domestically and overseas, including Pitch Black 16, Balikatan 18, Talisman Sabre 19 and Mahnuu 19. A significant highlight of her time while posted to 3AMES was as an OIC for the White Island Volcano Aeromedical Evacuation 2019.*

### A New Direction: Army's Role Two Enhanced Field Hospital into the Future

Major Kelsey Hamsey<sup>1</sup>

*1 2nd Health Battalion, 2nd Health Brigade*

As a result of the success achieved during Trauma Verification in 2021, a significant goal for Army's Role Two Enhanced (R2E) Field Hospital was achieved. Since then the strategic picture has changed resulting in the issuing of a new challenge to the 2nd Health Battalion at the start of 2023. A challenge that can be summarised as simply as 'move the hospital'—essentially to become lighter and more mobile. A challenge that Alpha Company (A Coy), 2nd Health Battalion (2 HB) has wholeheartedly accepted and is actively working to accomplish.

As the unit's Surgical Company, A Coy forms the core of the capability that generates the field hospital and, while our sister company in Adelaide works to establish their capability, is currently the only organisation in Army capable of force generating a deployable hospital effect. This effect is doctrinally considered to be a R2E-Small, a capability roughly half the bed-size of the hospital established for Trauma Verification.

The requirement to force generate a smaller field hospital as a unit has already contributed to the achievement of the goal of mobility. The recent establishment of the capability, as part of an internal unit exercise, saw the deployment of a hospital roughly one third the size of the last one deployed. Though an area of 50m x 70m was still required, it was a significant step towards achieving mobility. Exercise Talisman Sabre is the next step in this journey – the next opportunity to establish a smaller, lighter and realistically more mobile capability, theoretically capable of moving during the exercise in a reasonable timeframe without significant loss of surgical availability whilst it occurs. The ultimate goal relating to mobility is to refine a deployable field hospital capability that can be airlifted and is responsive to the developing global situation.

Concurrent to the challenge of mobility, A Coy has also continued to contribute to the development of the Role Two Forward (R2F) capability – a proximity line of effort that runs parallel to mobility. The team has built on the successes of 2022 and have moved into a 'Test of Concept', testing their ability to integrate both with a Close Health and a Combat element on exercise. It is anticipated that the successes achieved early in 2023 and their involvement with other activities throughout the year will move the R2F in a

direction to announce Initial Operating Capability as a live health element in 2024.

Underlying the challenges of mobility and proximity embraced by Army's deployable field hospital in 2023 is the concept of modularity. The ability to provide scalable Role 2 capabilities to suit any mission profile, casualty estimate and dependency demographic that span the full range of Role 2 from a R2F Damage Control Resuscitation and Damage Control Surgical effect to the foundations of an ADF Role 3 as inspired by the Trauma Verified Field Hospital. This scalability is not just in relation to the number of beds available but also relates to which levels of command are required to generate these capabilities— this may scale from a single Company independent venture to a Brigade level, multi-unit contribution.

Mobility, Proximity and Modularity – three key phrases to describe the challenges A Coy, 2 HB, as the core of, currently, Army's only deployable field hospital capability, has embraced in 2023. While the retention of corporate knowledge surrounding Trauma Verification remains critical, the changing strategic situation has resulted in the requirement for the Role Two Enhanced Field Hospital to adopt new challenges.

#### Biography:

*Major Kelsey Hamsey joined the Australian Regular Army in 2010. Allocated to the Royal Australian Army Medical Corps upon graduation from the Royal Military College – Duntroon in 2014, she has been posted to the Army School of Health, 1st Close Health Battalion, Headquarters Maritime Border Command and the Directorate of Soldier Career Management – Army. Her current appointment is as the Officer Commanding of Alpha Company, 2nd Health Battalion and of Army's deployable field hospital. She is a graduate of the University of New South Wales, with a Bachelor of Arts in Politics and a Master of Health Management, and she will shortly complete a Master of War Studies.*

## A Qualitative Assessment of Ukraine's Trauma System during the Russian Conflict: Experiences of Volunteer Healthcare Providers

Dr Lynn Lieberman Lawry<sup>1</sup>, Ms Jessica Korona Bailey<sup>2</sup>, Mr Luke Juman<sup>2</sup>, Ms Miranda Janvrin<sup>2</sup>, Dr Valentina Domici<sup>1</sup>, Dr John Maddox<sup>1</sup>, Dr Tracey Perez Koehlmoos<sup>1</sup>

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Permission to publish abstract not granted.

### Biography:

*Dr Lieberman Lawry is a physician, epidemiologist and biostatistician with three decades of experience in humanitarian aid, disaster response, development, global health implementation and research. She spent 20 years as faculty at Brigham and Women's Hospital, Harvard Medical School, and concurrently held faculty appointments with the Department of International Health, Bloomberg School of Public Health, Johns Hopkins and Uniformed Services University of the Health Sciences where she is currently a Professor of Preventive Medicine and Biostatistics. She has extensive experience in dozens of countries coordinating the provision of aid, facilitating development, and conducting population-based studies in conflict and post-conflict settings. Her studies elucidate the needs of populations regarding human rights, healthcare access, disease prevalence, mental health and gender based violence among many other public health topics - utilizing these data to improve policy to address global health needs in conflict and to better understand community dynamics that lead to insecurity. She developed courses and teaches extensively at USUHS for in-resident and global health distance learning certificate students. In addition, she developed courses through the Defense Institute of Medical Operations for teaching international militaries who will serve as Peacekeepers about the prevention of sexual exploitation and abuse and gender based violence.*

## A Rapid Review of The Association Between Chronic Pain and Suicidal Behaviour and Suicidality In Military and Veteran Populations

Dr Helen Kelsall<sup>1</sup>, Professor Karen Walker-Bone<sup>1</sup>

<sup>1</sup> Monash Centre for Occupational and Environmental Health, Monash University

Suicide in Australian Defence Force (ADF) members and veterans is a major concern and subject of an ongoing Royal Commission. Chronic pain is common amongst the Australian population; but military personnel are exposed to physical and psychological risks beyond those faced by others that also predispose to chronic pain. Chronic pain is associated with impaired function, economic burden, fatigue, poorer quality of life, and psychological disorders including depression, and adversely impacts work, sleep and relationships.

This rapid systematic review examined three research questions. A comprehensive database search of Medline, Embase and PsycINFO (2012- in military populations; 2020- in general population) identified 2,723 citations. Studies were assessed for eligibility and quality; 33 studies met the inclusion criteria. Key findings were:

- 1) Amongst Australian and overseas current serving and ex-serving military populations what is known about the prevalence of, and risk factors for chronic pain and what is the evidence for an association between chronic pain and suicidal ideation/suicide? Three reviews were identified, all were US studies. Prevalence of chronic pain 25.2%-34.5% in ex-serving men. There was no recent data on prevalence of, or risk factors for, chronic pain in ADF or current serving ADF personnel. It was difficult to tease out the specific contribution of chronic pain to suicide and suicidality given the comorbidity patterns amongst military populations, e.g. posttraumatic stress disorder (PTSD).
- 2) Amongst Australian and overseas current serving and ex-serving military populations what is the evidence for an association between chronic pain and suicidal ideation/suicide? 13 studies (3 systematic reviews, 10 primary studies) were identified. Although an association between chronic pain and suicidal ideation and/or behaviours was consistently reported, there was considerable variation in how pain was defined and what comorbid conditions were also studied. Some studies reported that chronic

pain conditions elevate risk of suicide attempts, with risk further elevated by other conditions; whereas others reported chronic pain as a non-significant contributor when co-morbid conditions were controlled for in analysis. A study of ADF personnel found higher rates of death by suicide in ex-serving (lower rates in current serving) personnel than similarly-aged Australian men in the general population and chronic pain amongst the risk factors.

- 3) Amongst Australian and overseas non-military (general) populations what is the evidence for an association between chronic pain and suicidal ideation or suicide? 18 studies were identified (4 systematic reviews, 13 primary studies). Chronic pain is a risk factor for suicidality; depression, unemployment, childhood abuse, sleep disturbance and alcohol misuse are risk factors for chronic pain and suicidality; two reviews reported a role for the interpretation of chronic pain in suicide risk; suicide risk more related to psychosocial factors than physical ones; and excess of suicide by medication amongst people prescribed some chronic pain therapies.

Chronic pain is especially prevalent in younger military and veteran populations. Chronic pain is one of many factors that contribute to suicidal ideation and behaviours in military and veteran cohorts. As with military and veteran populations, chronic pain in the general population may be adding to or magnifying the perceived burden associated with comorbidity and other factors. Chronic pain is potentially treatable and its impact on individuals should be considered when evaluating risk of suicide in military and veteran cohorts.

### Biography:

*Dr Helen Kelsall is a public health physician/epidemiologist and a Senior Research Fellow at Monash Centre for Occupational and Environmental Health. She has been an investigator on several veteran and military health studies including the Australian Gulf War Veterans' Health Studies, the Transition and Wellbeing Research Programme, and systematic reviews and meta-analyses on health outcomes and occupational exposures in military and veteran populations. She is a member of the Editorial Committee of the Journal of Military and Veterans' Health*

## A Retrospective, 12-month Review of Australian Defence Force Members Presenting with Foot and Ankle Conditions and Health Care Policy Implications

COL Andrews Higgs<sup>1</sup>

*1 Australian Army Reserve*

Foot and ankle injuries are common in the military population, occurring in military, sporting and day to day activities.

### Method

A retrospective review of all referrals to a single specialist, generated through Garrison Health Centres, over a 12-month period was conducted. The primary outcome measure was diagnosis at presentation. Secondary outcome measures included previous treatment, prior investigations, requirement for further investigations and subsequent intervention. A critical analysis of the members diagnosis and the influence of defence health policy on the members employability/deployability was also undertaken.

### Results

A total of 59 new patients, requiring 144 appointments were seen at the clinic during the study period. The most common presentations were ankle ligament injury and fractures occurring during sporting activities. The least common conditions were, crystal arthropathy, toe deformity and osteoarthritis. 13 (22%) patients proceeded to surgical intervention, the most common procedures being tendon repair (7) and ankle arthroscopy (5). The majority of patient had been imaged prior to referral (93%), though many (72%) required further imaging after specialist review.

### Conclusions

Most foot and ankle conditions can be managed without surgery. Within the military population, most foot and ankle presentations are the result of trauma or injury. Those requiring surgery will most likely undergo ligament or tendon reconstruction.

### Biography:

*COL Andrew Higgs is an Army Reserve Orthopaedic Surgeon, and currently the Deputy Director Army Health- Reserves. He works at a Major Trauma Centre and in Private Practice in Sydney, Australia. He is regarded as an expert in limb salvage and in the management of Foot and Ankle conditions' past military experience includes operational deployments*



to Iraq and Afghanistan as well as numerous Senior Medical Officer positions.

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### ADF Health Supporting Australia's National Interest in the Indo-Pacific Region

CAPT Amanda Plant

With rising tensions threatening the global rule-based order, *The Defence Strategic Review 2023*, has defined Australia as being in 'strategic competition' to maintain a power balance in the Indo-Pacific region which is favourable to our national interest.

My presentation defines why ADF health assets should be utilised as part of Australia's strategic framework by providing short-term public

health interventions, with short, defined timeframes and measurable outcomes. I would like to propose a 'Targeted Vaccination Program' in geostrategic locations in the Indo-Pacific area, as a method to integrate and create relationships and networks between the ADF, local governments and non-government organisations (NGO's). This proposal has been based off the success of the success of The World Health Organisation's Small Pox Eradication Program, which deployed small health teams to isolated communities, with the narrow focus of vaccinating against a single disease.

Vaccination programs are arguably the most cost-effective way to improve a nation's health status and reduce disease rates. A targeted vaccination program, can be adjusted to suit an individual community's needs, by focusing efforts on the most prevalent, debilitating and vaccine-preventable disease in each community. A targeted vaccination program reduces the logistical and administrative burdens by simplifying the vaccination schedule, cold-chain requirements and documentation needs to a single vaccine. Local health care systems would be complimented and not displaced, due to the narrow focus of the program and the targeted communities being in isolated areas. Vaccinations are portable, able to be given rapidly to large numbers of the population, with no need for any follow-up care or a continuous medical presence. This ensures that valuable ADF health assets, such as doctors, are not overcommitted to a continuous presence in a community.

ADF medical teams specialise in achieving health effects in austere environments. This places us in a unique position to provide health services to populations that are isolated due to geographic

barriers to their local health services. Opportunities for an ADF-led targeted vaccination program can be identified using a combination of strategic need, demographical data, infrastructure and terrain analysis, and population health statistics to ensure that measurable health outcomes can be achieved in geostrategic and remote communities.

#### Biography:

*CAPT Amanda Plant has 20 years' military experience. With a background in data analysis, geospatial information systems and health. She has a Master of both Public Health and Infections Disease Intelligence, and a Graduate Certificate of Global Health Engagement. She is passionate about identifying opportunities of how ADF health assets can be utilise as a tool to assist in achieving Australia's strategic interests, whilst providing a positive health effect to the local populations.*

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### ADF Malaria and Infectious Disease Institute (ADFMIDI) Investigation of Skin and Soft Tissue Infections Among Trainees in ADF Training Sites – Case Study Of 2 Training Sites

CAPT Jessica Chellappah<sup>1,2</sup>

<sup>1</sup> ADF Malaria and Infectious Disease Institute

<sup>2</sup> University of Queensland

*Staphylococcus aureus* is very common germ in the community, where it is often called 'staph' or 'golden staph'. Around 30% of people carry it on their skin or in their nose, usually without knowing about it. When the germ enters the body, often through broken skin (cuts and scratches), it can cause serious skin infections and conditions like pneumonia and blood infection (sepsis). MRSA stands for methicillin-resistant *Staphylococcus aureus*, meaning it is a type of staph that cannot be treated with some common antibiotics.

MRSA spreads by way of contact with a person who has an MRSA skin infection or who carries the germ on their skin or in their nose. Spread occurs either by direct skin-to-skin contact or by sharing personal items like towels, razors and clothes, or even by touching surfaces contaminated with MRSA. Environments where people live in close proximity, such as dormitories and barracks, are at particular risk of the spread of MRSA. This risk escalates further when those living in close-quarters have

cuts and scratches that make them prone to skin infections.

Case Study 1: Unusual occurrence of SSTI and antibiotic resistant SA in training recruits have already been reported by Health Threat Assessment Reports on ADF Australian Training Areas (2015-2019), including training cohorts at School of Infantry in Singleton, NSW. ADF Malaria and Infectious Disease Institute (ADFMIDI) in collaboration with School of Infantry in Singleton, investigated using a standardised sampling protocol to screen for SA and MRSA from trainees (nasal, axilla and groin carriage), personal items and commonly touched surfaces over their course of 16 weeks, to identify rates of staph carriage, the most commonly contaminated surfaces and sources of staph exposure, and to further phenotype and genotype such isolates to identify dominant strains and lineage. 51 training recruits chose to participate. Participants were screened at Week 1 and again at Week 16 to capture pre- and post-training surveillance. Results revealed clear risk factors and led to appropriate recommendations to mitigate risk of further infections.

Case Study 2: An outbreak of MRSA was detected in Blamey Barracks of Kapooka NSW. JHC tasked ADFMIDI to assist in environmental sampling and investigation to help understand ongoing sources of exposure and transmission of MRSA in the 1st Recruit Training Battalion. Results indicated clear source of transmission and led to appropriate recommendations to mitigate risk of further infections.

“Through a research study and an outbreak investigation, respectively, it was evident that the common source of *Staphylococcus aureus* and MRSA transmission are human-to-human, or human-environment-human, due to communal living with poor personal hygiene practices. This was concluded from significant increase of human nasal carriage of *Staphylococcus aureus* and MRSA observed between the start and end of training periods, as well as persistence of the same bacteria in accommodation, gym and obstacle course environments for up to 16 weeks. This was confirmed through gene sequencing for bacterial strain characterisation and comparison between samples obtained. Sequencing also showed a clear match between *Staphylococcus aureus* nasal carriage in some individuals and sampling from *Staphylococcus aureus* skin and soft tissue infections in other individuals, over the training periods, establishing a clear link of exposure source.

Out of a total of 1,200 samples from human and environment, up to 20% were identified as MRSA, an evident risk present in our training environments.

It was concluded that closer monitoring of accommodation cleaning of linen (by individual and/or contractors) and improved awareness and practice of personal hygiene and wound management are best mitigation to risk of skin and soft tissue infections.”

### Biography:

*CAPT Jessica Chellappah is an Epidemiologist and Clinical Microbiologist with ADFMIDI. She has worked over 15 years as an Epidemiologist at the Baker Heart Research Institute, VIC, and later a Medical Bacteriologist with Melbourne Pathology, VIC before joining ADFMIDI in 2017. She has since been on International Health Survey engagements and skill exchange programs in Thailand, Samoa and PNG as an ADFMIDI Scientific Officer, as well as conducting local surveillance and research of infectious diseases in ADF training sites around Australia.*

*She was seconded as an epidemiologist to the Department of Health National Incidence Room in Canberra during the COVID pandemic in 2021 and continues to work closely with local public health units in QLD in disease surveillance. As an adjunct academic with University of Queensland, she remains focussed on her passion for research in Bacterial infections that negatively impact ADF Force Health.*

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## Aeromedical Assessment Reports - Why We Do Them

Dr Benedict Whalley<sup>1,2</sup>

*1 Australian Defence Force*

*2 Institute of Aviation Medicine*

Permission to publish abstract not granted.

### Biography:

*SGNLDR Benedict Whalley is a Registrar AVMO at the Institute of Aviation Medicine. He has been a uniformed Medical Officer in the RAAF since 2013. Over the past year, Benedict has been working primarily in the area of aviation safety - including reviewing the processes of how physiological episodes are investigated and reported.*

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## Air Force Health - Clarifying the Clinical Readiness Conundrum

WGCDR Alan Turner<sup>1</sup>

*1 Air Force*

*In recent years, WGCDR Turner has contributed significant time and effort to establishing the Health*

*Professional Engagement Program - Air Force (HPEP-AF), along with SQNLDR Sally Faulks and GPCAPT Andrew Johnson. With the adoption of HPEP-AF by the Directorate of Air Force Health, Clinical Governance Cell, (CG-AF), WGCdr Turner has taken on the role of CG-AF Medical Advisor, working alongside GPCAPT Johnson, to implement the new Air Force Clinical Governance Framework.*

Full-time ADF health professionals are required to maintain broad clinical skillsets and apply them across a wide range of challenging situations. As a result, clinical currency is a complex issue that has challenged the health services of Army, Navy and Air Force over recent decades. The conflicting responsibilities of operational and non-operational units necessitates constant prioritisation of efforts. For Defence to optimise its health capability, we must develop and share a deeper understanding of the underpinnings of clinical readiness and be able to effectively quantify and communicate the associated risks.

In the post-DSR landscape, the need for Defence health to “Plan for the Unexpected” has never been more important. While we can draw reasonable inferences regarding the expected scenarios on a larger scale, the implications for individual health professionals is more difficult to predict. What we can reasonably presume, is that there will be an ongoing need to prepare our health professionals to deploy under three broad categories: 1. To provide primary care, 2. To support the part-time, specialist workforce in the care of critically unwell patients and, 3. To independently, or in small, non-specialist teams, step outside of the normal scope of practice and provide acute care to the critically unwell patient.

If we are to develop a clinical readiness framework that approaches these difficult challenges in a holistic way, the commonly conflated concepts of clinical readiness, credentials, scopes of practice, clinical currency, competencies and proficiency must be clearly defined and understood. Appropriate metrics and risk management strategies will better support Command to mitigate, communicate and accept risk at the appropriate levels, but also to design force generation programs that achieve their underlying, capability-driven goals.

The newly-formed Directorate of Air Force Health Clinical Governance Cell (CG-AF) recently embarked upon an integrated process to de-mystify the clinical readiness conundrum and, in doing so, provide Air Force with a pathway to optimise the clinical readiness of its health workforce. By bringing together the many works of our predecessors and current colleagues, engaging widely within Air Force

and across the other two Services and then applying the tenets of the Better Care Framework, we propose a new and holistic clinical readiness framework.

### Biography:

WGCdr Alan Turner is a FACEM and member of the Medical Specialisation Program. Currently working clinically as a consultant at the John Hunter Hospital Emergency Department and Hunter Retrieval Service, WGCdr Turner has been a full-time Air Force medical officer since 2006. Prior to joining the MSP, he was awarded his FRACGP and FACAsM and undertook a number of deployments and operational AMEs in the MEAO.

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## Aircrew and Mental Health (Part of IAM Panel)

GPCAPT Felicity Williams<sup>1</sup>

### *1 Defence*

Mental health (MH) is an important part of aircrew health. Mental health has the capacity to impact both members and capability. Symptoms are often not present at a level that requires formal diagnosis or pharmacological treatment, and are also not always recognised by the aircrew themselves as an issue. During this presentation I will discuss some of the challenges of identifying and managing Mental Health issues in aircrew in active flying squadrons and will use some aspects of clinical presentations to highlight these

Every flying squadron has traditionally had a high volume of tasking and/or training activities, with many pressures managing the priority of the moment and other day-to-day requirements. The capability need drives high volume tasking and also means there is usually some level of decreased ability to control tasking activity. Also aircrew themselves are usually highly motivated and task driven, and keen to remain medically fit to fly. There is usually good insight into the linkages between their health and their ability to perform their flying role, but there is also recognition of the potential to be ‘grounded’ because of health issues.

All of these factors have the capacity to influence appropriate recognition, disclosure and management of conditions which can impact Mental Health and Wellbeing.

I aim to explore the challenges in balancing capability requirements alongside the SLG intent of looking after our people in managing fatigue and burnout. I will discuss some of the issues and management

concerns in the aviators and support staff, and how these have been overcome with good communication and relationships between Health, the squadrons and their aircrew.

### Biography:

*Dr Williams has been associated with Air Force and the ADF since starting as a medical undergraduate at UNSW.*

*She is currently working with IAM supporting healthcare for a Canberra based flying squadron as well as supporting Mental Health and Wellbeing in Air Force.*

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## An Exercise in Deliberate Logistic Minimalism: The Battlefield Advanced Trauma Kit

Major Peter Zimmermann<sup>1</sup>, Captain Thomas Sefton<sup>1</sup>, LT Mallory Tuche<sup>1</sup>

*1 1st Health Battalion, Australian Army*

The introduction of TCCC principles in the early 2000s were complemented by the iFAK and led to a substantial drop in fatalities on the battlefield from potentially survivable battlefield injuries. This was achieved by giving front line combatants the ability to manage leading causes of death from potentially survivable battlefield injuries. The Battlefield Advanced Trauma (BAT) Kit seeks to address the remaining potentially survivable battlefield injuries through a focused approach on addressing haemorrhagic shock as far forward in the battlespace as possible.

Near-peer medium to high intensity conflict is expected to result in a volume of battle casualties that will rapidly overwhelm current Role 1 (R1) logistics and evacuation capabilities. This will have significant deleterious effects on mortality, morbidity, force morale and the ability to conduct combat operations.

This article describes the development of the BAT Kit as a response to the clinical, tactical and logistic challenges faced by R1 elements. The purpose of the BAT Kit is to deliver life-saving interventions for combat casualties at scale, in a logistically efficient manner, as far forward in the battlespace as possible. It is an exercise in deliberate logistic minimalism that will enable ADF capabilities to be re-configured into small, mobile, low-signature teams.

The MEAO experience on which most of our current medical thinking is based, whereby air superiority

gave coalition forces unprecedented levels of access to evacuation from point of injury to surgical facilities, is likely over. The Army Health Services (AHS) Concept of Employment (CONEMP) states: 'Rapid rearward evacuation by airborne platforms to definitive ... care may be difficult or impossible in future conflicts' (p6). For littoral operations, this reality must be the basis of planning.

To do this, the approach of 'Individualised Excellence' must be tempered with the realities of combat to provide 'Suitable, to achieve treatment at scale'. This principle is best evidenced in the Minimum, Better, Best model defined by the US Joint Trauma System. For many clinicians this is extremely challenging to reconcile, but is critical to AHS being able to deliver on its mission during combat operations.

Casualties die WHEN. Over the last 200 years, despite the variety in how and with what it is fought, there is a consistent trend of WHEN casualties die in combat. The majority (50-90%) are NOT preventable and typically occur immediately. The zone of interest for the BAT Kit is between 10-60 minutes.

Casualties die FROM. For 'potentially survivable deaths', haemorrhage remains the leading cause of mortality (between 85 to 95%). Introduction of combat application tourniquets has prevented most deaths related to extremity exsanguination. Now truncal and junctional haemorrhage represent the vast majority of potentially survivable injuries. Haemorrhage is therefore the key focus of the BAT Kit.

The design brief required the BAT Kit to be the bridge between the IFAK and Damage Control Surgery, with key deliverables of: consistency with Australian TCCC guidelines with focus on preventable deaths; enhanced haemorrhage control; early administration of pro-coagulants blood products, antibiotics and analgesia; consist only of in catalogue consumables; not exceed 1.5kg; and have zero training liability.

The estimated cost per unit is \$1400. This represents a significant efficiency dividend when compared to the costs of the consumables for a CFA Kit (\$1 200), R1 Resus Roll Bags (\$10 000) and R1 Treatment Team (\$40 000).

The BAT Kit is an evidence-based, cost-effective, disciplined logistic approach to providing interventions for preventable battlefield deaths as far forward in the battlespace as possible. It is packaged in a way that enables cost-efficient and streamlined scalability, allied interoperability, as well as simplifying logistic resupply during combat operations.



### Biography:

*LT Mallory Tuhe is a Pharmaceutical Officer at the 1st Health Battalion.*

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## Better Care for the Air Force – Implementation of the New Clinical Governance Framework

Gpcapt Andrew Johnson<sup>1</sup>, WGCDR Alan Turner, Ms Angela Borbelj, SQNLDR Sally Faulks

<sup>1</sup> DAFH

### Better Care for the Air Force

We have undertaken implementation of a new clinical governance framework, providing better care – Resilient Health Care – to our Air Force. Drawing from the passion of our people to deliver on our purpose.

Australian Defence Force health elements are expected to be ready, responsive and resilient, regardless of their environment. Air Force Health has developed a clinical governance framework that promotes, enables and delivers resilience and empowers the workforce to achieve its objectives through excellence in health care. In November 2022, the Air Force Clinical Governance Framework (the Framework) was formally adopted and a high level implementation plan was developed by the Directorate Air Force Health (DAFH) in conjunction with Health Services Wing.

CG-AF staff conducted a preliminary round of visits to the major Air Force bases to enable deep engagement with key squadron personnel and executive teams. From these visits, the following two major issues were identified:

- the current “credentialing” process is cumbersome, providing limited benefit for the significant investment of time required (protective safety)
- clinical readiness is ill-defined and clinical placements are difficult to achieve among competing priorities (productive safety)

Subsequent “deep dive” visits and further engagement with operational areas on credentialing processes and the barriers to maintaining clinical readiness led to the development of the following proposed constructs:

- Current credentialing processes need comprehensive review at both the operational and policy levels.

- Clinical readiness for combat = credentials + competencies + currency.
- Clinical Governance activities should directly inform assurance; if they don't, they should be re-evaluated and efforts redirected.
- Clinical currency must be informed by a clear understanding of the context of operations and likely capability requirements, consideration of lead times and the options for enablement, rather than a singular focus on clinical placements.

In order to progress these two major issues, CG-AF has taken an important role in driving and facilitating the following activities:

- Review of the Defence Health Manual Vol 2 Pt 17 Chap 2 – Health Workforce Governance, which considers the credentialing process.
- Establishment of a workshop of subject matter experts to provide clear advice to Air Force regarding clinical currency – this will be reported in a separate presentation at this Conference.

Implementation of the Framework, including a more balanced focus on each of the clinical readiness domains – credentials, competencies and currency – will see an improvement in both productive and protective safety, resulting in better care – Resilient Health Care – for our Air Force.

### Biography:

*After leaving full-time AF service in 1995, Andrew has had nearly 30 years experience as a senior executive in public and private healthcare organisations, with a major focus on patient safety, clinical governance and resilient healthcare systems. He has several book chapters and peer reviewed publications under his belt, across varied areas of medical leadership and management, including Disaster management, Conflict competence, Simulation, Negotiation and Patient Safety. He is a Professor at James Cook University College of Medicine and Dentistry and a Honorary Professor with the Australian Institute of Health Innovation at Macquarie University, and has been awarded as a Distinguished Fellow of the Royal Australasian College of Medical Administrators.*

*Andrew has rejoined Air Force as a SERCAT5 GPCAPT Senior Advisor in Clinical Governance, works part-time in Medical Leadership development with Metro North Health in Brisbane and runs a private consultancy focused on health leadership, resilient healthcare and conflict competence.*



### Beyond Battle Buddies: Peer Support in Military Mental Health

CAPT Tony Chen<sup>1</sup>

*1 Australian Army*

Military personnel share an intense mateship often described as closer than family, which supports their resilience in the face of demanding and potentially dangerous service. This presentation outlines our understanding of peer networks within the military and its implications for mental health in service members, particularly in the critical period of transition from military service. The philosophy of peer support in mental health care is explored and research on peer support programs for military and veteran mental health is summarised. These findings are discussed in the context of our growing understanding of veteran mental health, and key directions for the developing military peer support sector are outlined.

#### Biography:

CAPT Tony Chen is an Army Reserve Psychologist currently posted to the 6/10th Health Support Company, 3rd Health Battalion. He previously served in the ARA in 3rd Health Battalion and the 1st Psychology Unit. He works as a clinical psychologist across public health and private practice and is interested in military adjustment and trauma, rehabilitation and neurocognitive conditions

### BLOOD SAVES LIVES - Establishing Independence

Major Julie Lakotij<sup>1</sup>

*1 Australian Defence Force – Army*

Currently, the Australian Defence Force (ADF) is fully dependent on external organisations (Lifeblood, Coalition Forces) for supply of blood and blood products on operations. To be independent, the ADF must establish a blood plan that enables the force to collect, test, store and transport blood and blood products. The blood plan will include whole blood (WB) products and enable the activation of the Emergency Donor Panel (EDP) at all levels of health care. WB has significant logistical and clinical benefits and we must ensure this lifesaving product is available in the forward fight.

In order to achieve the above, it is recommended an ADF Blood Centre (ADFBC) be established, preferably in the Brisbane locality. The presentation will explore how this could be achieved by building on current

capability and infrastructure at the Enoggera Health Centre (EHC) Pathology Department. The Brisbane locality is recommended as it has the following assets, personnel and equipment within close proximity: 2 HB Pathology Department, 1 EHS Pathology Department, and the EHC Pathology Department. The ADFBC would enable the screening of donors for the EDP, in addition to the collection and banking of WB products ensuring the ADF are in a position to independently supply WB as required.

The presentation will highlight the importance of ensuring ADF Pathology Officers are appropriately trained in all aspects of technical and administrative blood banking. Due to the unique nature of the military requirement, there are no organisations within Australia that can provide the required training. Opportunities exist with the Armed Services Blood Bank (USA) from bespoke training to completing a blood bank fellowship.

The presentation will expand on the following topics:

1. Current limitations surrounding blood supply
2. Current blood products available to the ADF
3. Potential future products in the ADF
4. Building on current EHC Pathology Capability
5. Training of Pathology Officers in the technical and administrative requirements of Blood Banking

#### Biography:

*Major Julie Lakotij enlisted into the Australian Regular Army in 2001 and has worked at various military establishments around Australia. She commenced her military career as a Medical Technician, trade transferring to Laboratory Technician in 2007. On completion of the Bachelor of Medical Science Degree (Pathology) at Charles Sturt University (2014) MAJ Lakotij commissioned to the officer ranks as a Pathology Officer.*

*Operationally, she has deployed to the South Pacific Islands as part of a small Australian surgical team, Afghanistan, working at an American-led multinational Role 2 Hospital and Iraq as part of an Australian led Role 2 Hospital. MAJ Lakotij's most recent deployment was to the UAE where her primary role was PCR Covid testing to enable international travel within theatre and back to Australia. MAJ Lakotij is currently posted to the 2nd Health Battalion.*

## Blood Transfusion Practices in Intensive Care Units: Implications for Blood Demand in Deployable Hospitals

Lieutenant Commander Andrew Flint<sup>1,2,3,4</sup>, Associate Professor Zoe McQuilten<sup>2,5</sup>, Mr Alex Poole<sup>10,11</sup>, Dr Karina Brady<sup>2</sup>, Professor Erica Wood<sup>2,5</sup>, Dr Senta Jorinde Raasveld<sup>12</sup>, Professor Alexander Vlaar<sup>12</sup>, Dr Le Thi Phuong Thao<sup>2</sup>, Associate Professor Naomi Hammond<sup>6,7</sup>, Dr Serena Knowles<sup>6</sup>, Mr Conrad Nangla<sup>6</sup>, Brigadier Michael Reade<sup>3,4,8,9</sup>

1 Royal Australian Navy

2 Transfusion Research Unit, Department of Epidemiology and Preventive Medicine, Monash University

3 The Australian and New Zealand Intensive Care Research Centre (ANZIC-RC), School of Public Health and Preventive Medicine, Monash University

4 Intensive Care Unit, Royal Brisbane and Women's Hospital

5 Monash Health

6 The George Institute for Global Health, Faculty of Medicine, UNSW

7 Malcolm Fisher Department of Intensive Care, Royal North Shore Hospital

8 Joint Health Command, Australian Defence Force

9 Faculty of Medicine, University of Queensland

10 Discipline of Acute Care Medicine, University of Adelaide

11 School of Public Health and Preventive Medicine, Monash University

12 Department of Intensive Care, Amsterdam University Medical Centers

### Introduction

Blood transfusions are a common and potentially life-saving intervention in intensive care unit (ICU) patients. The supply and storage of blood products is however challenging with different storage requirements and shelf lives. United States (US) led Role 3 hospitals in Iraq and Afghanistan relied on frequent supply of red blood cells (RBCs) and fresh frozen plasma (FFP) from the US and donations from local personnel for whole blood and platelets.

We conducted two studies of blood transfusion practices in ICUs of Australia and New Zealand (ANZ). These studies provide the most recent and complete snapshot of blood usage in ANZ ICUs and may help to inform future demand for blood in deployed ICUs.

### Methods

Two prospective point prevalence studies of blood transfusion practices in ANZ. In the Point Prevalence

Program (PPP) study, individual-level data was collected over a 24-hour period, on all patients 16 years or older, admitted to participating ICUs at a 10 am census point on the study day, and then followed-up at 28 days. In the InPUT study, all adult patients admitted to participating ICUs over one week were included and followed-up at 28 days. Data collected included patient demographics, transfusion types and amounts, clinical reasons and triggers for transfusion, and use of point-of-care testing (POCT).

### Results

The PPP study was conducted in 2021 and out of 712 adult patients from 51 ICUs, 10.0% received a transfusion during the 24-hour period of observation, of which 8.9% received RBC transfusions, 1.4% received platelet transfusions, 0.8% received FFP, and 0.7% received cryoprecipitate. This included 9.9% of trauma patients, 6.4% of adult patients aged <40 years and 12.0% of patients aged 40 to <60 years, and 9.4% of patients in their first two days of ICU admission. POCT was available in 82.4% of sites but only used in 6.6% of transfusion episodes when available.

In the InPUT study conducted over 2021-2022 consisting of 927 patients from 40 ICUs across ANZ, over a one-week period of observation, 23% of patients received transfusions overall, and 21% received RBCs, 7% received platelets, 5% received FFP and 3% received cryoprecipitate. POCT was used to guide 5% of transfusion decisions.

### Conclusions

Transfusion of blood components is common in ICUs of ANZ, often early in the ICU stay, and is rarely guided by POCT. The results of these studies may help planning for future blood demand in the Australian Defence Force's deployable ICUs.

### Biography:

*LCDR Andrew Flint is a Medical Officer in the RAN doing intensive care specialist training through the Medical Specialist Program currently working at Royal Brisbane and Women's Hospital. He has deployed to the Middle East on Operation Manitou and has done multiple trips throughout Asia. Prior to Intensive Care training, LCDR Flint was posted to HMAS Kuttubul in Sydney and then to HMAS Coonawarra in Darwin, where he completed his fellowship in General Practice.*

*LCDR Flint is in the final stages of completing his PhD at Monash University in platelet transfusions in critically ill and bleeding patients. He has published multiple journal articles, presented at both national and international conferences, and is an investigator on several grants and ongoing international studies.*

### BlueRoom - An Innovative Mixed Reality Solution for Medical Training

SQNLDR Tassie Smith<sup>1</sup>, FLTLT Ben James<sup>1</sup>, Mr Dale Linegar<sup>2</sup>

*1 Royal Australian Air Force*

*2 Real Response*

AMMA Abstract – BlueRoom - An innovative mixed reality solution for medical training

Operational demand on fixed wing assets impacts the availability of aircraft for static and flying simulated missions for post-initial training and continuation training. This is further complicated by the fact that the C-130J operational squadron, 37SQN, is located at RAAF Base Richmond, while the core of aeromedical training is conducted at RAAF Base Amberley. The situation was exacerbated during the COVID pandemic, which saw an entire aeromedical course being unable to graduate due to border closures and lack of C-130J access. A number of solutions have been explored including use of part-task trainers and other simulated options. However, the requirement for high fidelity, real-time simulation training that provided the accuracy and flexibility to train clinicians to the level required to prepare for complex real-time missions could not be sufficiently met.

Defence, via the Defence Innovation Hub, had an existing agreement with Real Response to provide a mixed reality solution where ADF members could train as close to real-life as possible. HOCU further engaged Real Response to provide a solution to ensure high fidelity training could be undertaken on C-130J airframes when and where actual aircraft availability wasn't practical, feasible, or obtainable.

The BlueRoom Simulator is a mixed reality system designed to enable Navy, Army, and Air Force medical personnel to train in complex scenarios by entering a mixed reality environment where the learner can directly interact with the environment and the 'patients,' in a realistic manner. Learners are able to hone and practice physical and fine motor skills in an immersive environment. Traditional virtual reality requires controllers to interact with the digital, detracting from the sense of realism. Mixed reality combines traditional VR with real world aspects which allows the virtual world to be manipulated. The learner is able to perform interventions with their own hands, utilising actual equipment and medical kits that are used during the conduct of aeromedical evacuation missions.

BlueRoom's strength for use at HOCU is in its adaptability and flexibility at a fraction of the cost of

conducting training missions on an actual airframe. However, another game changer is BlueRoom's learner feedback ability and infrastructure. The learner's stress levels are measured real time via biometric monitoring which, when coupled with detailed intervention and recording enables debriefing to be linked to actual specific time events, video review (learner point of view and third person view). This is then linked directly to what level of stress was displayed by the learner at precise points during the simulation.

BlueRoom has extraordinary possibilities for implementation across all of ADF Health. In addition to C-130J, BlueRoom also currently supports an MRH-90 training environment, with the Real Response team also exploring utilising the system to provide TCCC training. The possibilities are limited only by the end-user's imagination.

#### Biography:

*SQNLDR Tassie Smith graduated as a Registered Nurse in 2004 and specialised in Paediatrics and Paediatric Intensive Care. Joining the Air Force in 2010 as a direct entry Nursing Officer, she completed postings in both Williamstown and Amberley before moving to the Reserves in 2019. SQNLDR Smith is currently undertaking CFTS at HOCU.*

*FLTLT Ben James holds a B.Sc and B.Nurs and has been a Nursing Officer in the RAAF since 2006. He has deployed on multiple international and domestic operations. FLTLT James is currently acting chief instructor at HOCU.*

*Dale Linegar is a Chief Technical Officer and Project Manager at Real Response, designing XR solutions for medics and other first responders. He is also the Managing Director of Games for Change Asia-Pacific, a non-profit dedicated to using games and related technologies to make the world a better place.*

*He is a PhD candidate at RMIT University examining how values can be accounted for in game design, and has over 18 years of experience as a game and simulation developer. He has worked as an educator, researcher and advisor at a wide range of universities.*

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### Challenges and Innovation in Conflict Healthcare: Ukraine Conflict Insights

Mr Sean Ryan<sup>1</sup>

*1 Aspen Medical*

Permission to publish abstract not granted.

### Biography:

*Sean Ryan currently holds the position Chief of Staff for Aspen Medical Group. He started his career as an officer in the Australian Defence Force (ADF) serving as a military planner in Bosnia-Herzegovina and Afghanistan, as well throughout Australia and the Indo-Pacific for various national disasters and crisis responses. Since retiring from the military, Sean has also filled various project and program management positions across Aspen Medical including numerous COVID-19 health responses and Pacific health initiatives.*

*He has considerable experience in strategic planning, corporate management, inter-agency coordination, multi-national stakeholder engagement, organisational training, and program management. By combining these skills, Sean has developed experience in coordinating and planning to deliver innovative models of care that promote access to health care in austere environments for Governments and private sector companies.*

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### Consultative research design workshop for the ADF Life Course Study to Measure and Monitor the Health of the Force

Professor Lisa Jackson Pulver AM, Dr Michael Drew

<sup>1</sup> Department of Defence, Canberra, Australia

<sup>2</sup> Department of Veterans' Affairs (DVA)

The Australian Government Department of Defence has identified eight strategic priorities for Defence health research, including 'Measuring and monitoring the health of the force'. One of the innovative ways the ADF is delivering this priority is scoping and building the foundations for a comprehensive life course health study (ADFLCS). This study will measure and monitor the physical, mental, social and environmental health of ADF members through their life course.

To date there have been several existing large-scale longitudinal health studies which have gathered insightful data outcomes for Defence. These prior research projects have built the foundations for a robust evidence base of its member's health data. The next evolution is to move towards a life course approach where the study is enduring beyond a defined study period and follows members' health and wellbeing across their life. This data will provide the data to underpin the prioritisation of areas of need, development and assessment of policies,

models of care, services and support for members both during and post service.

Defence invites experts to contribute their knowledge and expertise to provide advice and deliberations towards the scoping and research design of the ADF Life Course Study. Some questions and topics to consider are:

- What are the considerations for establishing a lifelong longitudinal study?
- What to avoid or include to ensure accurate data collection?
- What domains/areas should be included in the study?
- Opportunities for collaboration – domestically and internationally
- How to reduce the survey burden and attrition for participants?
- Data management
- What are the lessons learned from similar studies domestically and internationally?

### Biography:

*Professor Lisa Jackson Pulver AM. Lisa is an academic leader, a recognised expert in public health, prominent researcher, a visionary and tireless advocate for education and health using innovative methods to ensure that both are inclusive for all. Lisa is the Universities Australia nominee to The Australian Medical Council and has served as a Director for three terms. She is also in her third term as a ministerial appointee to the Australian Statistical Advisory Council. She has recently become a Fellow of the Royal Society of NSW. A visionary educator and strategically sound, Lisa is a leading commentator on education, health, data, research in both University environments and the Australian community in general, having led the successful development and adoption of the current strategy "One Sydney Many People" and having multiple guest appearances on The Drum, Q and A (ABC television), radio and via various podcasts.*

*Lisa has overseen dramatic increases in overall Indigenous student numbers and is now concentrating on educational innovations and curriculum reviews that will benefit all students, including undergraduate and postgraduate cohorts from all 170 countries and backgrounds from which University of Sydney students originate. Lisa is committed to an education which creates the next generation of leaders in the future workplaces of Australia and globally.*



She serves her country in the Royal Australian Air Force Specialist Reserve and has moved through the ranks from her initial commission as Flight Lieutenant to her current rank of Group Captain. Her artworks adorn the reports she writes and maintains an active metal plate printing practice. Lisa is well known for her collaborative and inclusive approach to all that she does.

*Dr Michael Drew.* Dr Drew commenced as Assistant Secretary Health Protection and Policy in Joint Health Command on 23 January 2023. This branch supports ADF capability through health surveillance, research, policy and senior technical/medical advice aimed at preserving the force to maintain capability while optimising members' health over their life-course.

*Dr Drew has a Bachelor of Physiotherapy (Honours), Master of Clinical Epidemiology, and a PhD in Physiotherapy. Dr Drew holds an Adjunct Associate Professor appointment at University of Canberra, is a Fellow of the Australian College of Physiotherapy (by Original Contribution), Fellow of the Australasian Institute of Digital Health, and a Fellow of the Australian Sports Medicine Federation.*

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### Defence Strategic Review (DSR): Some Health Considerations

Dr Neil Westphalen<sup>1</sup>

*1 Royal Australian Navy*

The Defence Strategic Review (DSR), released on 24 April 2023, had a two-fold aim: to provide a strategic assessment and a far-reaching strategy for the nation and the Government, as well as a roadmap for Defence to implement its recommendations. To these ends, it noted that the ADF's health networks must deliver persistent support and sustainment for operations, and recommended that it conduct a baseline estate and infrastructure audit, focused on workplace health and safety.

This presentation offers some thoughts regarding the DSR from a broader health perspective, based on his current history PhD studies.

#### Biography:

*Dr Neil Westphalen graduated from the University of Adelaide in 1985, joined the permanent Royal Australian Navy in 1987 and transferred to the Reserve in 2016. During this time, he accumulated 2 1/2 years afloat in the Red Sea, southeast Asia, southwest Pacific, and southern Indian Ocean, while undertaking multiple clinical and staff roles ashore in NSW, VIC and WA. His postgrad qualifications include a MPH, a DipAvMed, and Fellowships of the RACGP,*

*ACAsM and AFOEM. He was accepted as a history PhD candidate at UNSW Canberra in March 2020; his topic "Medical Support for RAN Operations 1901-1976".*

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### Detection and Mitigation of Hearing Loss in the Australian Defence Forces

Dr David Sly<sup>1,2</sup>, Ms Migein Swindon<sup>3</sup>, Ms Anna Terrell, Professor Gary Rance<sup>3</sup>

*1 Ear Science Institute Australia*

*2 Department of Surgery (Otolaryngology), The University of Melbourne*

*3 Department of Audiology, The University of Melbourne*

Hearing loss is an enormous problem in Australian Defence Force Personnel and detecting this hearing loss is vital for protecting soldier's safety. Recently there has been a paradigm shift in the laboratory and clinical understanding of the onset and progression of hearing loss due to noise exposure. Our new understanding of the 'hidden hearing loss' due to damage to the nerves in the inner ear suggests that hearing loss may be well advanced before the standard hearing test (i.e. the audiogram) used for decades in military and other populations detects any deficits.

We examined a population known to have a history of noise exposure (Defence Force Personnel) and determine if those with normal audiograms had deficits in more sensitive tests of hearing. We recruited 40 soldiers and civilians from Victoria and Simpson barracks and tested their hearing using an audiogram and administered a questionnaire to measure self-reported history of noise exposure. 26 soldiers and civilians with normal audiograms underwent further study in our clinics with an extensive range of hearing tests that are well established in clinical use, but not normally used for the detection of noise-induced hearing loss. In particular, we focused on sensitive tests of the nerves in the inner ear and tests of real-world speech among background noise.

Our results suggest a deficit in inner ear hair cell function in soldiers with otherwise normal hearing as measured by the audiogram and that this is related to increased noise exposure. Other recent research also suggests the presence of hidden hearing loss in individuals with a history of noise exposure that is often not detected by a standard audiogram hearing test.



### Biography:

*Dr David Sly is Chief Operating Officer of Research at Ear Science Institute Australia. He is an auditory neuroscientist with multidisciplinary experience working with surgeons, scientists, audiologists and engineers. His research aims to develop drug therapeutics and technology for hearing loss and hearing augmentation.*

*After his PhD, he worked at The Bionic Ear Institute and The University of Melbourne where he led research into cochlear implants, hearing diagnostics and hearing therapeutics utilising cellular, surgical, drug, electronics and instrumentation approaches. Between 2011-15 he was Deputy Head of the Department of Otolaryngology at The University of Melbourne.*

*At Swinburne University of Technology between 2016-2022 he was discipline lead of teaching in Clinical Technologies and Neuroscience and led research into augmented hearing and diagnostic medical technology for Defence and Industry.*

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## DFR: Future Planning and Future Proofing! Recruiting the Next Generation of Health Officers to Build and Sustain Defence Health Capability

LEUT Kate De Saily<sup>1</sup>, SQNLDR Kathryn Harris<sup>1</sup>, CAPT Tecla Makoni<sup>1</sup>

<sup>1</sup> Defence Force Recruiting

The mission Defence Force Recruiting (DFR) mission is to recruit the right people, in the right numbers, at the right time - in order to build and sustain Defence capability.

Every year, DFR manages approximately 8,000 targets, of which, over 200 are Health roles. Although the Health roles only make up a small portion of the overall recruiting targets, they are undoubtedly some of the most challenging positions to fill. The Professional Services Recruitment Team (PSRT), a national combined military and ManPower (soon to be Adecco) recruitment team was established within DFR in a concerted effort to achieve these unique recruitment targets.

Currently, three full-time ADF Health Officers are posted to the PSRT, with a representative selected from each service. The role of the military team is to promote the ADF as a career of choice to qualified health professionals, university students, and high school students interested in pursuing a health

career in the future.

The PSRT contribute to the management of key stakeholder relationships with tertiary institutions and other relevant professional health organizations nationally.

Over seven years, the PSRT have contributed to exponential growth in Health recruitment - increasing the target fill rate from between 30 and 40 per cent, to upwards of 93 per cent.

However, the global geopolitical instability coupled with significant health workforce burnout in the aftermath of the COVID-19 pandemic has resulted in a phenomenally challenging recruitment environment, the likes of which ADF health has not seen before.

The PSRT rely heavily on the input and support of the wider Defence health fraternity, and through this presentation we will describe our current recruitment pathway, exploring the unique challenges faced by DFR, and provide an opportunity for robust discussion with delegates who possess a vested interest in future ADF health capability.

### Biography:

*LEUT Kate De Saily appointed to the Royal Australian Navy as a Nursing Officer in 2018. She has worked extensively with the Maritime Operational Health Unit (MOHU) to provide general and psychiatric nursing services to ADF personnel. LEUT De Saily has been a member of the Professional Services Recruitment Team for Australian Defence Force Health specialists since Nov 2021. She lives in Melbourne with her beloved Jack Russell 'Milky Joe'.*

*Captain Tecla Makoni grew up in Zimbabwe where she completed her Nursing Degree in 2005. She worked with MSF in providing humanitarian assistance to communicable diseases overseas prior to enlisting in the Australian Regular Army as a Nursing officer in 2017. Her Army health experience includes both Close and General health.*

*SQNLDR Kathryn Harris joined RAAF in 2008 as a direct entry Nurse. Has enthusiastically worked with 4EHS, 3EHS & 3AMES, 2EHS and JHU and now is recruiting the future force of ADF health capability with DFR. She often leaves at home her understanding husband simon, Kids Leo and Tyler, and crazy staffy Gnarly!*

### eFAST scans for all: Extending the scope of diagnostic practice for Australian Army Medics, Nurses and Radiographers

Dr Luke McRae<sup>1</sup>

*<sup>1</sup> Australian Army*

Point of care ultrasound scans (POCUS), in particular extended focused assessment with sonography (eFAST) has been in use for the last three decades in the assessment of trauma patients in Emergency Departments. eFAST as a diagnostic tool in use by trained doctors, usually Emergency Physicians, has been well validated. Evidence for non-doctor operators while not as prolific suggests similar results in remote medicine and tele medicine augmentation. The Australian Army currently trains its doctors and only underwater and special forces medics in eFAST. We argue that there are numerous as yet unrealised benefits of training all medics, nurses and radiographers in eFAST. The current discussion expands on these benefits and outlines a more rigorous program for skill development and maintenance. Finally Army wide training of all pre Role 2 clinicians in eFAST will enable a foundation in ultrasound use that could provide the basis for other ultrasound capabilities such as guided peripheral nerve blocks and emergent or primary health field diagnostics for prolonged field care.

#### Biography:

*Captain Luke McRae is a PGY7 General Practitioner serving full time with the Australian Army. With a Bachelor of Medicine Bachelor of Surgery at Deakin University, he posted to the 2nd General Health Battalion, 4th Health Battalion and this year returned to the 2nd Health Battalion. Luke's interests are in medical imaging, training and project analytics. He also enjoys working in Emergency medicine when he is able. Luke also has a Bachelor's degree in Psychology and a Masters of Business Administration. Recent extracurricular achievements have included the UQ Advanced Surgical Anatomy course, the QUT Surgical Anatomy course and the Westmead Advanced Imaging Technology course. He is married with three boys and in his spare time enjoys oil painting and making classical guitars.*

### Effectively Disengaging From Work - The Key to a Resilient Healthcare Workforce Training for War and Prepared for Peace

FLTLT Kirsty Lewis<sup>1</sup>

*<sup>1</sup> Royal Australian Air Force*

ADF healthcare professionals have reported an inability to effectively disengage from work, regardless of mission profile, workplace, or workplace stressors. This lack of disengagement leads to decreased resilience, increased cortisol levels, and jeopardised mental and physical health among healthcare providers.

Currently, there is no research reflecting the experiences of ADF healthcare workers regarding the disengagement at the end of a work period and the self-reported advantages of doing so. However, emerging research from the UK and US militaries identifies a similar trend and highlights the need to educate healthcare workers to improve health outcomes and maintain workforce capability. The COVID-19 pandemic has produced a generation of healthcare workers who were unable to adequately disengage from work. As a result, these healthcare workers have experienced increased compassion fatigue, sleep disturbance, and progressively poorer mental and physical health outcomes.

The aim of this research review is to identify the broad impact of the inability to effectively disengage from work on healthcare workers in the military context. Additionally, the study seeks to determine the existence of current ADF programs that may assist healthcare workers in achieving effective disengagement. Ultimately, this research aims to inform the development of an education session for ADF healthcare workers. The education session will emphasise three stages of self-guided skills and recognition tools to assist healthcare workers in developing daily workplace habits that promote disengagement and build resilience; maintaining and strengthening those new habits, implementing skills regardless of environment and to rehabilitate and grow after challenging periods.

By equipping our healthcare workforce with tools to adequately prepare for and disengage from traumatic events, varied job roles, work hours, and workplaces, we aim to improve the physical and mental health and resilience of our military practitioners. A workforce that is prepared for and supported prior to life-changing events is a workforce capable of embracing and growing through workplace challenges and traumatic events, thereby supporting training for war and preparing for peace.

### Biography:

*FLTLT Kirsty Lewis joined the Air Force in 2011 as a Nursing Officer with a Bachelor of Nursing and rural, trauma centre and clinical education backgrounds.*

*FLTLT Lewis has completed a Masters of Nursing (Clinical Education), Graduate Certificate in Health Care Management (Safety and Quality Management) and a Specialist Certificate in Critical Care.*

*FLTLT Lewis has been posted to Joint Health Command at RAAF Base Richmond and RAAF Base Amberley, Health Operational Conversion Unit in both Standards and Development and as an Instructor in Training Flight, and currently 3 Aeromedical Evacuation Squadron detachment Amberley initially as the Officer in Charge of Professional Development and Training and currently as the 2IC of the detachment.*

*FLTLT Lewis has deployed to the Middle East Area of Operations and Papua New Guinea in addition to multiple aeromedical evacuation missions. FLTLT Lewis has attended exercises Cope North, Mobility Guardian and Pitch Black as an Observer Trainer and Australian representative for Five Eyes Interfly validation teams. FLTLT Lewis was the aeromedical evacuation subject matter expert within Exercise Talisman Sabre 2023 planning.*

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## Embracing Change: Empowering Medics through Contemporary Education in Aotearoa's Health Workforce

Maj Brendan Wood C.StJ, DSD, ED,  
RNZAMC<sup>1</sup>, Mr Caleb Demegilio-Rose<sup>1</sup>

<sup>1</sup> *Auckland University of Technology, Te Wānanga Aronui o Tāmaki Makau Rau*

In 2020, the New Zealand Defence Force (NZDF) recognised the need to align the education and qualifications of their medics with the evolving demands of contemporary healthcare practice. At that time, NZDF medics did not achieve a New Zealand Qualification Authority tertiary qualification, nor were they eligible for certification or registration as practising health practitioners within the New Zealand healthcare context. This misalignment prompted the NZDF to request a proposal for the NZDF Medic Career and Learning Pathway (MCLP) to address this crucial issue.

To bridge the gap and deliver NZDF medics with suitable qualifications, the Auckland University of Technology, Department of Paramedicine, was

awarded a contract to develop and implement a tertiary qualification under the MCLP. In collaboration with the NZDF, a delivery strategy that aligned with the NZDF's existing approach was implemented. As a result, two qualifications were introduced: the Diploma of Paramedic Science (DipParaSc) and the Graduate Certificate in Health Science (GradCertHSc). These qualifications incorporate military-specific education and integrate four specialised courses within the domain of military medicine.

The curriculum of both qualifications is fully integrated with the Bachelor of Health Science in Paramedicine qualification, which enables the graduate to register as a Paramedic.

In addition to the military-focused curriculum, students must undertake core health science courses, including anatomy and physiology, pathophysiology, and academic writing. After 18 months of implementation, a comparative review of student achievement revealed that NZDF medics outperformed civilian paramedic students in core courses. This begs the question: what factors contribute to higher achievement among NZDF medics?

The alignment of medic education within the NZDF has significant implications for the broader healthcare workforce in New Zealand. Recent military operations supporting disaster response and recovery have underscored the value of a coordinated and integrated approach to healthcare delivery. The NZDF, with its trained medics who possess specialised skills and knowledge, can contribute to a whole-of-government healthcare strategy during times of crisis. The education and qualifications obtained by NZDF medics enable them to seamlessly collaborate with other healthcare professionals, enhancing the overall effectiveness of healthcare delivery.

Following on from the exceptional performance of NZDF medics, could a further alignment of their education with contemporary tertiary pedagogy, adherence to best practices and, evidence-based learning strategies, produce NZDF medics with a well-rounded education that enhances their understanding and proficiency in core health science disciplines.

Could aligning medic education with the specialized scope of practice further improve healthcare delivery within and beyond the military context? By focusing on military medicine and providing targeted training, NZDF medics acquire skills that are directly applicable to the unique challenges they may encounter during deployments, exercises, or

humanitarian missions. Specialised training equips them with the expertise to provide high-quality healthcare in austere environments, ensuring the well-being of military personnel and civilians alike.

This educational initiative not only enhances the capabilities of individual medics but also contributes to a whole-of-government approach to healthcare delivery, fostering resilience and effectiveness in times of crisis. By embracing change and empowering medics through contemporary education, Aotearoa's health workforce is enhanced.

### Biography:

*With a career in paramedicine that began in 1990, I am a registered Paramedic gaining a qualification as an Intensive Care Paramedic. My educational background includes a BHSc in Paramedicine and a PGDip in Paramedicine.*

*Over the past 40 years, I have actively participated in emergency ambulance services and played a crucial role in training and developing healthcare and military leaders at operational and strategic levels. From 2014 to 2015, I served in the New Zealand Defence Force (NZDF) as the Chief Instructor of the Defence Health School.*

*I am currently a Senior Lecturer and Military Programme Leader at Auckland University of Technology (AUT) and work with the NZDF. I am appointed as the Deputy Chancellor of Hato Hone St John New Zealand, where I also chair the St John National Clinical Governance Committee. I am an elected member of the Australasian Military Medicine Association Council.*

*I am honoured to be a Commander of the Order of St John (CSt.J) and a recipient of the New Zealand Distinguished Service Decoration (DSD) and Efficiency Decoration (ED). Additionally, in 2019, I was appointed a Fellow of the Australasian College of Paramedicine, highlighting my significant contributions to the field.*

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## Emergency Services and Defence Interoperability - The Journey Continues

Ms Georgeina Whelan<sup>1</sup>, Brigadier David Ward<sup>2</sup>

<sup>1</sup> Australian Army

<sup>2</sup> ACT Emergency Services Agency

The ACT Emergency Services Agency (ESA) is not dissimilar to Australian Defence Force Health System, in our case are tribes are The Rural Fire Service, The State Emergency Service, Urban Fire and Rescue and unique to the ACT our Ambulance Service.

Our Agency faces its own interoperability challenges but desires to be an organisation that develops practical strategies to become a learning organisation with focus on interoperability/collaboration.

In 2022 our initial paper presented at AMMA posed questions such as:

Have organisations within ACT ESA worked effectively together during past events?

Can the organisations within ACT ESA work more effectively together in future events?

Has the ADF High Risk Weather Season Joint Task Force and the ACT ESA worked effectively together during past events? How can we collectively enhance interoperability to work better into the future.

This was followed up by a pilot exercise to inform internal quality related research without ethics approval (due to the timeframes ethics was not feasible in the timeframe) with a view to progressing to a more formal research program and would inform future opportunities to enhance interoperability.

The Defence Strategic Review states that the 'ADF needs a much more focused force structure based on net assessment, a strategy of denial, the risks inherent in the different levels of conflict, and realistic scenarios agreed to by the Government'. To that end, the review calls for a transition from a 'balanced force' to a 'focused force', which it defines as a force 'designed to address the nation's most significant military risks. One of the key themes is that States and Territories should aim to have sufficient emergency services to support natural disaster relief without the ADF, except in the most extreme cases.

The build-up of State and Territory capability will take time and the threat we face nationally and regionally due to the change in our climate suggests that future HRWS may be as catastrophic as that experienced in 2019-2020 Black Summer. To that end the ACT ESA seeks to achieve two outcomes: Continue to learn from the ADF and maintain a degree of interoperability to ensure the best possible outcomes in the most extreme event.

This presentation will cover:

- A description of the Pilot Exercise that explored the importance of interoperability in multi-agency emergency response, particularly in the context of responding to complex or major incidents.
- Incorporating a Joint approach
- lessons learnt in Ukraine and recent conflict



- National Defence/DSR implications
- What the future of the training partnership looks like.

### Biography:

*Brigadier David Ward is the Director General Army Health Reserve. Brigadier Georgeina Whelan is a project officer in the Directorate of Army Health.*

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## Engineering Pathways to Recovery for Psychological Injury Amongst the Serving and Ex-Serving

Adj Assoc Prof Colman O'Driscoll<sup>1,2</sup>, Professor Zachary Steel<sup>1,2</sup>

*1 Discipline of Psychiatry and Mental Health, UNSW*

*2 Mental Health Services, St John of God Health Care*

In 1990 Richmond Hospital established the first Trauma Recovery Program (TRP) for Veterans presenting with PTSD within a private hospital environment. Evaluation undertaken at the time showed the treatment led to significant clinical improvement with symptoms gain sustained at 2 years post treatment (Humphreys et al., 1999). This model of care became the template for a national expansion of the TRP treatment framework. However, even from this time it was clear that even though these programs led to clinical gain the majority of participants the remained with high levels of clinical impairment.

In 2018 we reviewed the TRP treatment program using recent developments in trauma research applying assessment battery included the disturbances in self-organization (DSO) section of the International Trauma Questionnaire (ITQ). The ITQ has been developed to measure the ICD-11 diagnosis of Complex PTSD. The clinical outcomes within this new data assessment period (September 2015-Dec 2017) confirm significant improvement of PTSD symptoms across the course of time for the full cohort ( $p=0.037$ ). However, analysis of results stratified by baseline DSO symptoms (divided into three equal groups described as low-moderate DSO, high DSO and Severe DSO) indicating that there are significantly different treatment effects as a function of the DSO levels. Analysis of National TRP Data (Phelps et al., 2018) also found that clinical complexity and comorbidity was associated with poor responding clinical trajectories.

This led us to implement a modular care pathway model that linked injured first responders and veterans to pathways of care based on a multimodal

assessment program. The aim of this was to better match the needs of the veterans to the range of services available to them through our and partnered facilities as well as to ensure that we moved closed towards a personalised care model where the right treatment was delivered to the right person at the right time. We present the initial findings of this change, looking at longitudinal change in symptoms across care engagement. Programs reviewed within the SJOG service include inpatient admission, DBT, Trauma Recovery Program (TRP), and Skills Training in Affective and Interpersonal Regulation (STAIR). Other factors considered in relation to positive client outcome included, adverse events during programs, dropout rates during programs, sustained outcomes, and readmission rates. The initial findings indicated that the new care pathways demonstrated sustained clinical outcomes, lower dropout rates, and fewer adverse events during the course of the program.

Humphreys, L., Westerink, J., Giarratano, L., & Brooks, R. (1999). An intensive treatment program for chronic posttraumatic stress disorder: 2-Year outcome data. *Australian and New Zealand Journal of Psychiatry*, 33(6), 848-854.

Phelps, A. J., Steel, Z., Cowlishaw, S., Metcalf, O., et al (2018). Treatment Outcomes for Military Veterans With Posttraumatic Stress Disorder: Response Trajectories by Symptom Cluster. *J Trauma Stress*, 31(3), 401-409.

### Biography:

*Colman has over 25 years experience across the health system and in senior leadership roles within the government, corporate, not-for-profit and private sectors - including as a Chief of Staff in the NSW Government, Chief Executive with St John of God Health Care and Adj Assoc Prof with the University of NSW. He brings together significant leadership, operational, high level policy, strategic reform and development experience.*

*Zachary is a psychologist who holds the St John of God Chair of Trauma and Mental Health, a partnership between Richmond and Burwood Hospital in NSW and the School of Clinical Medicine UNSW. He has a 30 year history of work with populations affected by trauma, including veterans, emergency service workers, refugees, asylum seekers and those affected by mass conflict. He is the immediate past president of the Australasian Society for Traumatic Stress Studies (2019-2021) and Board member for the Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) in NSW.*



### Enhancing Military Medical Training for Future Conflict Scenarios: The Virtual Advancement of Learning for Operational Readiness (VALOR) Program

Dr. Michael Poppe<sup>1</sup>, Dr. Michael Barrie<sup>1</sup>, Col John Dorsch<sup>1</sup>, Dr. Jennifer Polson<sup>1</sup>, Talia Weiss<sup>1</sup>, Dr. Tyler Andre<sup>1</sup>, Dr. Ryan Ribeira<sup>1</sup>, Dr. Karthik Sarma<sup>1</sup>

<sup>1</sup> Simx, Inc.

#### Introduction

As the geopolitical landscape continues to evolve, the specter of multi-domain combat operations against near-peer adversaries looms, posing significant challenges to traditional medical response paradigms. Among these is the “Golden Hour” doctrine, which mandates providing definitive care to those sustaining traumatic injuries within 60 minutes. This doctrine, however, may be insufficient in the face of potentially high casualty counts resulting from the deployment of sophisticated weaponry by formidable nation-states. Such a rapidly shifting landscape necessitates an innovative response to maintain optimal readiness for future conflict scenarios. In response to this exigent need, we present the ongoing efforts of the Virtual Advancement of Learning for Operational Readiness (VALOR) program. Funded by the United States Air Force, VALOR represents a broad-scale initiative designed to enhance the medical simulation training landscape. The primary objective of this program is to augment the efficacy of medical training provided to warfighting personnel, focusing on the stabilization and temporization of medical techniques to extend the “Golden Hour.”

#### Methods

The design principles underpinning the VALOR project aim to redress the limitations and drawbacks of previous VR simulation efforts. These principles focus on enhancing immersion, realism, and flexibility while concurrently driving down costs. VALOR employs a commercially available virtual reality (VR) platform, adapted and enhanced to meet the unique needs of the military context. The program employs an iterative and agile development approach, incorporating needs and gaps analyses to guide the design and implementation of training curricula. A layered framework was adopted, comprising an underlying platform layer adapted from civilian capabilities and a curricular layer developed using a domain-specific language. The platform's runtime facilitates the interpretation of

the curricula, enabling seamless deployment and evaluation.

#### Results

The VALOR program has developed diverse capabilities and comprehensive curricula spanning Tactical Combat Casualty Care (TCCC), Advanced Resuscitative Care, En-Route Care, and other specialized training curricula. The 25-scenario VALOR CORE curriculum covers the spectrum of TCCC and specialized medical response scenarios. These include Prolonged Casualty Care, Small Unit Care, and the management of medical emergencies arising from exposure to Chemical, Biological, Radiological, Nuclear, and high-yield Explosive threats.

#### Conclusion

The implementation and successful deployment of the VALOR program demonstrates that VR, in conjunction with current-generation technologies, can be harnessed to create viable and effective tools within the military medical simulation training ecosystem. These tools not only cater to localized medical simulation training needs but also extend to distributed settings, thereby addressing a significant unmet need in the field. The VALOR program thus represents a pioneering initiative in the domain of medical simulation training, contributing to the readiness and resilience of our warfighting personnel in an increasingly unpredictable world.

#### Biography:

*Michael Poppe, MD is a member of the Medical Oversight Board at SimX, Inc. He currently serves as a staff emergency physician for Combat Logistics Battalion 11 at Camp Pendleton in Oceanside, California. He received his medical degree from Virginia Commonwealth University, and completed his Emergency Medicine residency at the Naval Medical Center San Diego. With a background in military medicine, he remains scholastically active through case content creation with SimX, Inc. as well as through authorship of book chapters and case reports covering topics such as Prolonged Casualty Care.*

### From the 20th to the 21st Century: Utilizing a Bio-Psycho-Social- Spiritual Model of Care for Veterans – Planning for an Unexpected Future

CHAP (Col) Charles Vesely<sup>2</sup>, CHAP (WGCDR)  
Assoc. Professor Lindsay B. Carey<sup>1</sup>, Chap  
Andrew Watters<sup>1</sup>

<sup>1</sup> ADF Directorate of Spiritual Health and Wellbeing

<sup>2</sup> Chaplaincy Joint Training, Australian Defence College

#### Introduction

This paper will explore the relevance of the ADF utilizing the Bio-Psycho-Social-Spiritual model of care for ADF veterans and their families. Following the turn of the 21st Century, the inauguration of the 'bio-psychosocial-spiritual' model of care commenced (Sulmasy, 2002). Previously, quasi-holistic approaches were advocated during the 20th Century; such as the "bio-psycho model" and then the "bio-psycho-social model" — but neither of these were truly holistic as they failed to factor the 'spirituality of humanity' which accounts for people's sense of meaning and purpose to 'live-on' despite life's struggles — which can involve horrendous trauma and tragedy often accompanied by unspeakable suffering and death. Yet 'spirituality' is an element of humanity quite often neglected as part of holistic care – but potentially invaluable for resilience and warrior readiness (Koenig, et al 2022).

#### Background

Spirituality is most commonly defined as "that aspect of humanity that refers to the way individuals seek and express meaning and purpose and the way they experience their connectedness to the moment, to self, to others, to nature, and to the significant or sacred" (Puchalski, et al., 2009). The WHO has repeatedly affirmed within its policies the importance of "identification, correct assessment, and treatment .... whether it be physical, psychosocial or spiritual" (WHO, 2017). In accordance with this policy, the WHO commissioned the 'Spiritual Intervention Codings' (WHO, 2017; "WHO-SPICs") as part of the International Classification of Diseases and Health-Related Illnesses (WHO-ICD-10AM). The 'WHO-SPICs' are accessible across the Australian Health Care System and are incorporated within the Systematized Nomenclature of Medical and Clinical Terms (SNOMED-CT) which are utilized by the ADF. The Spiritual Intervention codings provide a means by which medical, nursing or other allied health carers (e.g., chaplains), can record a variety

of pastoral/spiritual care interventions, however, the coding and reporting of such activities are largely reliant on organizational administrators.

#### Purpose

This paper, in accordance with the conference theme ('Planning for the Unexpected') will present the development, implementation, and potential utilization of the Bio-Psycho-Social-Spiritual model of care and the subsequent utilization of the 'WHO-SPICs' / SNOMED-CT codings as indices of the various spiritual/pastoral care interventions implemented across all three services (i.e., Navy, Army, and Air Force).

#### Method

This paper will explain the WHO-SPICs / SNOMED-CTs by considering the specific categories of intervention which will include (i) spiritual assessments, (ii) spiritual counselling, guidance, and education, (iii) spiritual support, and (iv) spiritual ritual activities, (v) spiritual administration and management. Other issues also to be discussed will include (vi) mental health and (vii) moral injury.

**Conclusion:** Adopting a bio-psycho-spiritual model of care expands the current health reach of the ADF allowing a broader application of holistic care. The utilization of WHO-SPIC / SNOMED-CT codings collected by healthcare staff and ADF chaplains, will assist the ADF to care more holistically for its members. The intervention codings will also serve as a more accurate means to aid in the rehabilitation of ADF members needing assistance, but also to proactively implement referrals to other health carers so as to ensure the holistic care of ADF veterans and subsequently their families.

#### References

Koenig, H.G., Carey, L.B. et al (2022). *Spiritual Readiness: A Handbook for Military Leaders and Chaplains*. New York: Amazon Books.

Puchalski, C. et al (2009). Improving the quality of spiritual care as a dimension of palliative care: The report of the Consensus Conference. *Journal of Palliative Medicine*, 12(10), 885-904.

WHO (2017). 'Spiritual Intervention Codings'. *International Classification of Diseases and Health-Related Illnesses. (ICD-10-AM)*. Geneva: World Health Organization.

#### Biography:

*Chaplain (Colonel) Charles Vesely, MMin, MIAES, ARA, is a Senior Army Chaplain and Director of Chaplaincy Joint Training, Australian Defence College, Canberra, Australia.*

*Chaplain (WGCDR) Assoc. Prof. Lindsay B. Carey, MAppSc, PhD. RAAFSR, is Research Director, with the ADF Directorate of Spiritual Health and Wellbeing, and Associate Professor, School of Psychology and Public Health, La Trobe University, Melbourne, Australia and Assoc. Prof. (Adjunct) the Institute of Ethics and Society, University of Notre Dame, Sydney, Australia.*

*Chaplain (RAN) Andrew Watters, MTh., MPhil (Ecum.) is a Navy Chaplain and Deputy Director with the ADF Directorate of Spiritual Health and Wellbeing, Canberra, Australia.*

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### Growing Beyond Trauma. Promoting Post Traumatic Growth and Wellbeing in Cohorts Exposed To Traumatic Events

Ms Jennifer Wheeler<sup>1</sup>

*<sup>1</sup> Department Of Defence/ Australian National University*

Historically, research has focused on the development of psychological disorders following exposure to a traumatic event. Focusing on a pathogenic framework following a traumatic event, however, may not fully capture or reflect an individual's experience or functioning post-trauma. A growing body of research has demonstrated that some trauma survivors can experience positive psychological changes following a traumatic event, with transformations beyond pre-trauma levels of personal functioning. Positive adaption following a traumatic event has been termed posttraumatic growth (PTG). Areas of growth and positive change following a traumatic event can include relating to others, a greater sense of personal strength, appreciation of life and changed priorities, and recognition of new possibilities. Research has demonstrated that experiencing growth post-trauma can lead to positive mental health and wellbeing outcomes.

Research is increasing understandings of how an individual can grow and transform following a traumatic event. However, there remains limited PTG research in Australian workgroups who can be exposed to PTE. To date, no research has been conducted on PTG in the Australian Defence Force. Operationalising PTG into effective interventions for trauma survivors (or entire workgroups who may be exposed to trauma), has so far been limited, despite the potential for protective mental health benefits.

This presentation will provide an overview of PTG, including its prevalence, predictors and benefits following a traumatic event. This presentation will also give an overview of a current PhD research program

on PTG. This research program will measure levels of PTG literacy in a Defence population, in addition to developing and piloting a PTG preventative program to increase participants' literacy and protective skills to facilitate growth in the aftermath of a future traumatic event.

#### Biography:

Jennifer Wheeler is a registered psychologist who commenced work with the Department of Defence in 2001. Between 2001 and 2010 Jennifer undertook the roles of Research Psychologist and Senior Research Psychologist within the Psychology Research and Technology Group, with responsibility for Personnel Selection Research. She was an Australian representative on The Technical Cooperation Program (a collaborative five-nation forum) between 2004 and 2010. In 2010, Jennifer commenced in the role of Director Navy Psychology, within Navy Health Services. In this role, Jennifer managed and oversaw the delivery of psychology services in Navy, in addition to the development of psychology policy and programs. Jennifer commenced as a Sir Roland Wilson Foundation Scholar at the Australian National University in February 2023, on secondment from the Department of Defence.

Jennifer's PhD research program is examining Post Traumatic Growth (PTG), following exposure to a traumatic event. This research program aims to measure the level of PTG literacy in a Defence population, in addition to identifying key predictive factors of growth following exposure to trauma. This knowledge will inform the development and subsequent trial of a preventative PTG psychoeducational program to promote growth and wellbeing, in the aftermath of a future traumatic event.

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### Health Professional Engagement Program - Lessons Learned Two Years On

SQNLDR Sally Faulks<sup>1</sup>, WGCDR Alan Turner, GPCAPT Andrew Johnson

*<sup>1</sup> Directorate Of Air Force Health*

We can't always plan for the unexpected, but with the right tools we can adapt to whatever circumstances we face. For Air Force Health professionals, this means resilience, connection, collective knowledge sharing, which we foster through the Health Professional Engagement Program (HPEP).

In 2021, three Air Force doctors identified the need for an engagement program for Air Force medical officers, and with senior endorsement made it

happen. The program started with the matching of junior medical officers with senior counterparts to provide mentoring. HPEP grew organically from then on, expanding the offering to include online Career Pathway and Facilitated Peer Support Network sessions.

The Directorate of Air Force Health (DAFH) supported HPEP in 2022, through funding a contracted mentoring platform to assist with matching, training and administration. The program expanded to include Environmental Health officers and Medical Technicians, tailoring offerings to the needs of each health category.

HPEP expanded further in 2023 to encompass Nursing Officers, Dental Officers and Dental Assistants. Now firmly embedded in DAFH, the program's future sustainability will be supported by established resourcing and formal program planning.

This presentation will share the HPEP model, lessons learned and feedback from participants.

### Biography:

*SQNLDR Sally Faulks is an Air Force Medical Officer, currently posted to the Directorate of Air Force Health. Sally is currently completing her fellowship with the Royal Australasian College of Medical Administrators, and is a general practitioner. She has been part of the HPEP leadership team since its inception and continues to be passionate about supporting and mentoring junior health personnel.*

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## How Historical Military Blood Transfusion Data Can Inform Estimates of Transfusion Requirements in Modern Combat Operations

Dr Elissa Milford<sup>1,2,3</sup>, BRIG Michael Reade<sup>1,2,4</sup>

<sup>1</sup> Faculty of Medicine, University of Queensland

<sup>2</sup> Department of Intensive Care Medicine, Royal Brisbane and Women's Hospital

<sup>3</sup> Headquarters 2 Brigade, Australian Defence Force

<sup>4</sup> Joint Health Command, Australian Defence Force

Early blood transfusion is a cornerstone of modern trauma care that undoubtedly improves patient outcomes. Blood products have greater complexities in terms of their manufacture and storage than other pharmaceuticals, so their supply to military operations requires special consideration. One of the starkest examples the difference a well-functioning blood supply program makes was the clear superiority of the British Army blood transfusion

program over that of any other nation in World War II (WWII). There were many factors that contributed to its success but underpinning these was the prior planning that commenced six to twelve months before the outbreak of war. The resulting highly effective supply chain was thought to be the primary reason patients treated at British field hospitals had better outcomes than those treated by other nations. In contrast, the lack of preparedness by the United States at the start of the Korean war resulted in no blood supplied for the first 70 days.

These experiences highlight the importance of peacetime planning, and key to any transfusion plan are accurate estimates of transfusion requirements. However, estimating the potential transfusion requirements of an unknown future conflict is a complex task with many variables involved. In other similarly complex systems such as the weather or the economy, predictions of future behaviour are heavily based on an analysis of past data. So, estimates of transfusion requirements in future operations can be informed by analysing blood use in the conflicts since the discovery of blood typing and blood banking shortly before the start of World War I.

Analyses of the historical data is complicated by the number of different blood products and how these along with clinical practice have changed over time. Comparison of the data is facilitated by using a standardised measurement of blood products, comprising of a unit (500 mL) of whole blood (WB) or whole blood equivalent (WBE) (1 x red cells, 1 x plasma, 0.2 x platelets, 0.2 cryoprecipitate). However, there are clinical and logistic advantages and disadvantages for each product that should be considered along with the total WBE required. Furthermore, what was supplied historically does not necessarily equate to what was needed. Oversupply leads to wastage, while undersupply leads to preventable deaths.

Differences in the nature of conflict also affect blood usage. The requirements in contingency or stability operations will differ from large scale combat operations largely due to the differences in casualty rates. The time to reach a resuscitation facility influences requirements as higher prehospital deaths result in lower transfusion requirements in survivors. The requirements change with the phase of the operation, with demands fluctuating with operational tempo and rapid, sometimes unpredictable, surges need to be accommodated. There has been an increase in the number of units per transfused casualty with time, with 1 WBE unit transfused per transfused casualty in WWII, 2 in Korea, 4.4 in Vietnam, and 5.8 in the most recent Afghanistan and Iraq conflicts.



Taking these multiple influences and trends into consideration, it is estimated that approximately 20% of military casualties in a modern large-scale conflict will require transfusion, and that each transfused casualty will require 8 WBE units, meaning each casualty will require an average of 1.6 WBE units. For contingency or stability operations, 10 WBE units per facility is recommended to support one major haemorrhage casualty. A higher blood wastage threshold than would be acceptable in civilian practice will likely be necessary, particularly in low intensity operations. These planning figures can be used to analyse current transfusion capabilities, identify deficiencies, and then inform solutions, to ensure that Defence is well prepared to minimise preventable deaths in any future conflict.

### Biography:

*MAJ Elissa Milford is an Intensive Care Specialist on the Medical Specialist Program and currently works at the Royal Brisbane and Women's Hospital. She has a research interest in trauma, coagulopathy, endothelial dysfunction, and transfusion medicine. She recently submitted her PhD thesis on the role of the endothelial glycocalyx in severe trauma and is nearly halfway through a masters degree in biostatistics with a particular interest in novel adaptive clinical trial designs.*

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## Insights from the Civil-Military Interface During OP COVID-19 ASSIST

LTCOL Timothy Inglis<sup>1,2,3</sup>, LTCOL Joanne Wilson<sup>2,4</sup>

<sup>1</sup> University of Western Australia

<sup>2</sup> Health Department of Western Australia

<sup>3</sup> RAAMC

<sup>4</sup> RAANC

### Background

Operation COVID-19 Assist presented a series of challenges to command staff in Western Australia. The pragmatic solution was to make best use of available Defence personnel to bring order to unfamiliar tasks at unprecedented volume for an uncertain duration.

### Analysis

While some staff possessed highly relevant skills, including those reflecting prior civilian health experience, some of the best placed health staff were in high demand from a public health system under strain. The default force generation process struggled

to keep up with and administer changing demand for specific types of Defence Aid to the Civil Community. Normal civilian health tasks such as quarantine and isolation, contact tracing, incident response and state government agency just-in-time planning had to be learned by liaison officers on short rotations. Noting that some of the highest demand occurred well into the COVID-19 emergency, when many public sector staff were already fatigued, it is remarkable that the State Task Group (JTG629.6) was able to continue to support the civil community until the end of the operation.

### Recommendations

There are some lessons for civil organisations from Defence planning processes, information management, risk assessment and specialist health logistics. There are also important civilian lessons for future domestic operations, in particular for Health Emergencies, when the Reserve is the capability and Defence Health staff are in demand from both sides.

### Conclusion

Now is a good time for a thorough review of the lessons learned at the civil-military interface.

### Biography:

*Dr Inglis works with the WA Country Health Service, PathWest Laboratory Medicine and the University of Western Australia on the Country Health Infection programme. He was senior medical officer to the Joint Task Group in WA throughout the COVID pandemic. LTCOL Wilson is an experienced Army nursing officer and worked as a member of the WA State Health Incident Control Centre during the pandemic. Both currently work with the emerging Health Reserves Advisory Group in WA.*

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## Integrated Military Mental Health Model - A Proposed Pilot Program

MAJ / Dr Craig Mattern<sup>1</sup>

<sup>1</sup> Joint Health Command

### Proposal for Integrated Military Mental Health Model

At present there is a shortfall in clinical coordination for acute mental health cases both outside of normal business hours and physical sites external to Garrison Health facilities. This proposal aims to remediate these deficits by establishing a formalised structure to improve the coordination of the acute care and support to members. The proposed integrated model incorporates a tiered level of support which would be scalable as required for each situation. The key to this model are;



- 1 Establishment of a new position Mental Health Case Co-ordinator on site at Garrison Health Facilities to act as a single point of contact for each of the key stakeholders in the care of members.
- 2 Establishment of formalised peer network to provide low level, non-clinical support, upskilling of existing uniformed members.
- 3 Establishment of Memorandums of Understanding with existing Community Mental Health Acute Care Teams (CMH ACTs)

### Biography:

MAJ Craig Mattern enlisted in Jun 2009 as part of the Undergraduate Medical Sponsorship Program. He completed postings within Close Health and Aviation roles prior to his current posting to Tobruk Clinic in 2020 under Joint Health Unit - Central NSW Attained Fellowship with RACGP in 2016 and completed a Post Graduate Diploma in Sports and Exercise Medicine with Distinction through the University of Otago in 2020.

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## Latest National Blood Authority Patient Management Guidelines-Critical Bleeding Module

CAPT Anthony Holley<sup>1</sup>

<sup>1</sup>Royal Australian Navy

The management of critical bleeding is an important aspect of military medicine for all military Health Professionals. Uncontrolled Bleeding represents a significant cause of potentially avoidable deaths in the combat setting. The Australian National Blood Authority Patient Blood Management guideline for critical bleeding has recently undergone an extensive revision. This guideline is currently in press. As a member of the Clinical Review Group that developed these evidence based guidelines, the process of development including generation of the PICO questions, systematic review and grading of the evidence, will be considered. The Critical Bleeding module recommendations and “good practice “ points will also be presented.

### Biography:

A/Professor Anthony Holley BSc. MBCh. DipPaeds. DipDHM. FACEM. FCICM

Anthony is an intensivist working at Royal Brisbane and Women's Hospital. He is an A/Professor with the University of Queensland Medical School. Anthony is a former ANZICS President. He is a senior examiner

for the fellowship of the College of Intensive Care Medicine of Australia and New Zealand. Anthony has authored ten book chapters and 58 peer reviewed publications. Anthony serves as a representative for the National Blood Authority Critical Care Group in developing the Australian Patient Blood Management Guidelines. Anthony serves in the Royal Australian Navy and has deployed on active service on multiple occasions including multiple tours to both Afghanistan and Iraq. Anthony is currently the Director Navy Health Reserves.

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## Machine Learning Analysis of Risk Factors For Progression from Suicide Ideation to Suicide-Related Behaviours in Contemporary Australian Defence Force (ADF) Members

Professor Nicole Sadler<sup>1</sup>

<sup>1</sup> Phoenix Australia - Centre For Posttraumatic Mental Health

Suicide risk is dynamic and multifactorial, making it difficult to predict who will or will not attempt suicide. It remains unclear which factors lead to the progression from suicide ideation to plans and attempts, noting that although ideation is an important precursor to attempts, most suicide ideators never attempt suicide. As identification and appropriate intervention remain important goals for clinicians and organisations such as the military, the detection of any themes or factors which may guide assessment and decision-making is of interest and value. This presentation details findings from a research project supported by the Royal Commission into Defence and Veteran Suicide, and it builds upon analysis undertaken as part of the 2010 ADF Mental Health Prevalence and Wellbeing Study and the 2015 Transition and Wellbeing Research Programme. Machine learning (ML) techniques (feature selection and predictive modelling) were used to identify data-driven factors to distinguish between serving and transitioned ADF members reporting suicide ideation only and those reporting suicide-behaviours in cross-sectional surveys from 2010 and 2015, and a longitudinal sub-group. Survey data included mental, physical, psychosocial health, and demographic, occupational and trauma histories.

The ML analysis on the cross-sectional and longitudinal datasets indicated that the themes of particular interest are active suicide ideation, mental

health symptoms (particularly lowered mood), trauma exposure, beliefs about the negative impact of ADF service on mental health, and disturbances in functioning. The findings highlight themes or areas for examination that may not be routinely considered or included in initial screenings or assessments for escalating suicide risk but appear to be relevant for the serving and ex-serving ADF populations.

To our knowledge, this study is the first to apply ML techniques to examine predictors of the progression from suicidal ideation to action in a contemporary Australian military cohort. It demonstrates the potential value of ML in developing predictive, data-driven (rather than theory-driven) models to identify those at increased suicide risk within this population, particularly in large multi-domain datasets. Implications of the findings, including potential opportunities to supplement clinical decision making and enhance current suicide prevention programs for serving and ex-serving ADF members, will also be discussed.

### Biography:

*Nicole Sadler is the Head of Policy and Practice at Phoenix Australia and an Enterprise Professor within the Department of Psychiatry, University of Melbourne. She is a Clinical Psychologist with an in-depth understanding of issues and challenges for individuals working in high-risk organisations and roles, and the systems and services to improve and maintain mental health and wellbeing in workplace settings. She has led mental health strategic reviews and policy and training development projects for the military, police, emergency services, healthcare workers, insurance companies, judiciary agencies and community organisations at Commonwealth and State levels. Nicole has also worked with communities impacted by disasters. Prior to joining Phoenix Australia in 2017, she served in the full-time Army for 23 years and completed her career in the senior Army psychology position at the rank of Colonel. She is completing a PhD examining suicidality in contemporary serving and transitioned ADF members through the University of Adelaide.*

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## Many Colours, One Cause: The Creation of a Remote Access Paramedic Capability in the Australian Capital Territory

Mr Greg Brown<sup>1</sup>

*1 ACT Ambulance Service*

Canberra is known as the bush capital thanks to its abundance of nature reserves and proximity to vast mountain ranges. However, it is also a city with an above average population growth (2.2% pa vs 1.7% pa nationally) and with a young and outdoor focussed demographic. At the same time, the Australian Capital Territory Ambulance Service (ACTAS), like all jurisdictional (statutory or otherwise) ambulance services in Australia, has sustained a steady increase in emergency calls received and patients requiring transport; in terms of raw numbers, there were 52,000 cases raised in 2017-18 compared to 75,000 in 2022-23.

A review of the Productivity Commission's report on government service's data shows that despite the rapid increase in case numbers the ACTAS consistently achieves the fastest E000 call pickups, the shortest ambulance waiting times, and an enviable proportion of patients who reported a clinically meaningful reduction in pain based on paramedic level interventions – without a directly correlated increase in staffing. Consequently, and commensurate with the increasing population and ongoing outdoor lifestyle, the ACTAS has seen a steady increase (in terms of quantity and severity) in patients requiring treatment and transport from outside of the urban fringe. This has provided significant challenges to a Service which has sustained substantial roster pressures based on the impacts of extreme weather events and a global pandemic – how do you invest in building and maintaining a specialist capability aimed at responding to patients who are off the beaten track when for every remote job there are over 2,000 within the city?

In 2019 the ACTAS embarked on a phased approach to creating an internal capability able to locate, treat, and extract patients from remote areas – and by remote, we mean anywhere that a two-wheel drive ambulance cannot easily access. Within the ACT, this means that such a patient might be: an elderly walker on Mt Taylor who can see their house, the hospital, and Capital Hill, but who has stumbled on a frosty path and gashed their head; a mountain biker on Mt Stromlo who can see nothing but a broken humerus, a busted up bike, and a blackberry bush; or an experienced outdoor enthusiast who is

now stuck in the snow in deepest darkest dinosaur country (aka the Namadgi National Park).

This presentation will cover:

- A description of the ACT in comparison to the Shoalwater Bay Training Area in terms of area, ambulance coverage, and aeromedical assets;
- The roles and responsibilities of an ACTAS Remote Access Paramedic;
- The process by which ACTAS Remote Access Paramedics are selected;
- The training received by the cohort to date including that which has involved the Australian Defence Force;
- The assistance provided to ACTAS throughout the selection and training processes from both government and non-government entities; and
- What the future of the ACTAS Remote Access Paramedic process looks like.

### Biography:

*With over 25 years of experience in command, management and leadership positions in Australia and overseas with various government and non-government agencies, Greg Brown CSC, NSC now combines his clinical experience in a broad range of challenging environments (including military, health intelligence and civilian roles) with his passion for high quality adult education as the General Manager of Education for the Australian Capital Territory Ambulance Service.*

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## Medical Ultrasound: An Emerging ADF Capability

FLTLT Megan Lower<sup>1</sup>

<sup>1</sup> Royal Australian Air Force

Medical Ultrasound is an emerging ADF capability with new equipment set to be delivered through Joint Project 2060 Phase 3. The equipment is aimed to provide both comprehensive and focused ultrasound modules and will support a forward and agile concept of employment.

Medical Ultrasound allows routine and emergency examinations to be performed at the patient's bedside and supports the rapid triage of patients in mass casualty situations. The information provided from an ultrasound examination aids in rapid clinical decision making leading to improved patient outcomes. This capability will have a direct impact on patient management including priority of treatment, fitness to remain in an austere location,

and evacuation suitability and precedence. It supports the delivery of evidence based, best practice clinical care from initial assessment, treatment, and evacuation to the most appropriate destination medical treatment facility as part of the Aeromedical Evacuation System.

This presentation will explore how Medical Ultrasound can be utilised in a deployable medical treatment facility specifically detailing its application in battlefield trauma and aeromedical evacuations. It will discuss current barriers for employment and clinical training hurdles experienced by ADF Medical Officers and Radiographers.

### Biography:

*My name is FLTLT Megan Lower and I am a Radiographer/Sonographer in the Royal Australian Air Force. I have served for 13 years and am currently posted to 2EHS at RAAF Base Williamtown. I graduated from the University of South Australia as an AHPRA accredited Radiographer in 2012 and then undertook specialised ultrasound training through the Air Force Civil Schooling Scheme from 2017 – mid 2019. I have been a Sonographer accredited through the Australian Sonographer Accreditation Registry since mid 2019 and have since further expanded my skills in the field of musculoskeletal ultrasound. I have a keen interest in ultrasound education and training and hope to facilitate the smooth delivery of new ultrasound modules to ADF through Joint Project 2060 Phase 3.*

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## Medicinal Cannabis use in Australia and Implications for Military Medicine

Dr Aparna Hegde<sup>1,2</sup>

<sup>1</sup> Royal Australian Air Force IAM

<sup>2</sup> CASA

Medicinal Cannabis has been made legally available for therapeutic use in Australia since 2016. The use in the general community and veterans has increased exponentially over this time. In the military setting, we know what to do with recreational use of cannabis but are not familiar with the therapeutic versions.

There are now registered schedule 4 and 8 products, gynaecological and topical agents, wafers, capsules, oils, dried flower and vape products derived from cannabis and hemp resulting in a plethora of treatment options. The therapeutic use is for a wide range of disorders from mental health issues such as anxiety and PTSD, chronic pain, insomnia, movement disorders and irritable bowel syndrome.

This has implications for military medicine including the prescriber, military patient, treating doctor, medical review officer in workplace alcohol and drug testing as well as the general public that need defining. Unlike in the community setting where the user pays for these medications privately as they are not on the PBS, funding of these products by DVA has been permitted. The aim of my presentation will be to outline the current situation in Australia with the use of medicinal cannabis and the pragmatic way forward with the use of these novel therapeutic agents.

### Biography:

*Dr Aparna Hegde has been in the RAAF since 1991 initially joining as many do as part of the undergraduate scheme while studying medicine in UWA. Unlike many however, she remained in service completing the DAuMed through Kings College and an exchange posting with the RAF as PAF and then in the RAAF Specialist Reserves with RAAF IAM to date. She is a founding fellow of FCAAsM with over 25 years of experience in the field of Aerospace Medicine. Aparna is currently based in Perth primarily in clinical practice as well as working as the regional SAVMO for WA and enjoys regularly inducing hypoxia in military aviators.*

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## Melanoma in Aircrew and Defence Force Members – a Literature Review

Wgcdr Catherine Scarff<sup>1</sup>

<sup>1</sup> Air Force

Melanoma is a common and potentially lethal skin cancer, whose development in many cases is directly related to UV exposure. However, there are additional factors that have been associated with an increased risk of developing melanoma, including several occupational groups. Pilots and aircrew are one such example. Many, though not all, studies have shown these workers to be at increased risk of both developing and in the case of pilots, dying from melanoma. Much of the data reported however, is from decades ago and mainly relates to male pilots in the northern hemisphere. Most data also relate to civilian as opposed to military aircrew.

This presentation discusses the results of a narrative review of the published literature on the topic of melanoma in aircrew. Using a systematic approach, with terms related to melanoma and aviation, PubMed was searched in June 2022. Additional articles (up to December 2022) were included during the analysis period where relevant. During

the search, papers which also discussed melanoma occurrence in defence force members were located and are presented in the review, with a particular focus on the intersection of aircrew and defence members. Data was extracted from articles and arranged into the themes presented in this review, being: Occupation and melanoma, Melanoma and aircrew, Melanoma and defence force members. The literature search also identified articles which discussed and explored sun protection knowledge and behaviours in some defence force members. While beyond the original scope of the review, this literature will also be discussed given UV exposure and sun protective behaviours are a key factor in melanoma development. This final theme is Defence force members and sun protection.

This review presents a summary of the published literature and discusses options for future studies, including to review the incidence of melanoma and sun protection knowledge and behaviours in the Australian Defence Force context.

### Biography:

*Catherine Scarff is a dermatologist and academic in the Air Force Reserves. She is a senior lecturer in the Department of Medical Education, University of Melbourne and a Researcher in the Directorate of Health Research. Her areas of interest range from aviation medicine and dermatology to the assessment of health professional trainees in the workplace.*

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## Military Drinksration: A Smartphone Application to Support Alcohol Behaviour Change in Service Personnel

Surg Capt Kate King<sup>1,2</sup>, Dr Daniel Leightley<sup>2</sup>, Professor Neil Greenberg<sup>2</sup>, Professor Nicola Fear<sup>2</sup>

<sup>1</sup> Research & Clinical Innovation

<sup>2</sup> King's Centre for Military Health Research

Alcohol consumption is intrinsically linked to military populations with evidence that UK Service personnel drink significantly more than civilian populations and that this excess continues beyond the end of Service. There is, however, no evidence for the effectiveness of alcohol behavioural interventions in military populations. DrinksRation is a smartphone application (app) which aims to change alcohol use behaviours in Service personnel. This session describes the app and the randomised controlled trial (RCT) undertaken in the UK military population in more detail, and will present provisional data.



The DrinksRation app has been developed by King's Centre for Military Health Research and the University of Liverpool following Medical Research Council Complex Intervention guidelines. It has undergone an evidence focused development with published trials looking at feasibility, acceptability and initial pilot studies. These showed that personnel engaged with the app regularly and that real time, personalised, and military focused, credible feedback was appreciated. It is designed to provide customised brief interventions using personalised messaging and feedback on drinking behaviours and is tailored specifically for a military population.

The Military DrinksRation study is a two-arm randomised controlled trial comparing the DrinksRation app with treatment as usual. Participants are serving in the UK Armed Forces and recruited through periodic dental inspections, targeted communications, and military social media. Eligible participants score 5 or more on the Alcohol Use Disorders Identification Test-C (AUDIT-C), showing an increased risk of alcohol related harm. Consenting participants will be randomised in 2 participant blocks in a 1:1 ratio to ensure equal gender distribution. Additionally, data will be collected on a range of behaviours associated with drinking and wellbeing using validated surveys disseminated through the app or the REDCap research programme. The primary outcome measure is a change in alcohol units consumed per week between baseline and day 84 as measured by the timeline follow back method. Secondary outcomes are change in AUDIT score, change in quality of life assessment, change in drinking motivations and app usability. The Military DrinksRation study is ongoing and recruitment expected to start in May/ June 23. The study will be reported in line with the CONSORT criteria for RCTs and the Template for Intervention Description and Replication guide. A similar trial of the Drinks:Ration app using a help-seeking veteran population demonstrated that between baseline and day 84, weekly alcohol consumption had a reduction of -10.5 [95% CI: -19.5 to -1.5] units in the control arm and -28.2 [95% CI: -36.9 to -19.5] units in the intervention arm (p-value=0.003; Cohen's d=0.35). It is hypothesised that the results of the trial in an in-service population will be similar. This trial aims to, for the first time, demonstrate the effectiveness of behavioural interventions in reducing alcohol consumption in a military population. This could lead to the app being integrated into Defence policies for managing and supporting military personnel seeking help for alcohol use.

## Biography:

*Surg Capt Kate King is a Royal Navy GP, GP trainer and researcher who took the lead in the UK Defence Medical Services' Academic Department of Military General Practice in Nov 23. Her Naval experience covers a variety roles; serving in the Gulf, Mediterranean, west Africa, preparations for disaster relief, an air station, various training establishments, with the Royal Marines and with the Dutch Navy for a large multinational exercise. In the firm base, she has led wide scale practice improvement programmes and run the UK Defence GP speciality training scheme. Her research interests are typical of a GP; varied, and cover alcohol use, behaviour change, mental wellbeing, women's health and education.*

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## Moral Injury and Post-Traumatic Stress Disorder: What are the Differences? What are the Similarities? What are the 'Great Expectations'?

[SQNLDR \(Professor\) Matthew Bambling<sup>1,4</sup>](#),  
[CHAP \(WGCDR\) Assoc. Professor Lindsay B. Carey<sup>1,2,3</sup>](#),  
[Dr Nikki Jamieson<sup>1</sup>](#), [Dr. Nikki Jamieson<sup>1</sup>](#), Professor Harold G. Koenig<sup>5</sup>

<sup>1</sup> ADF Joint Health Command

<sup>2</sup> La Trobe University

<sup>3</sup> University of Notre Dame

<sup>4</sup> University of Queensland

<sup>5</sup> Duke University Medical Centre

## Introduction

Post-Traumatic Stress Disorder has long been recognised as a defined mental health condition with specific diagnostic criteria and was first included in the Diagnostic Statistical Manual (DSM III) in 1980. A PTSD diagnosis is symptom-based and typically associated with exposure to trauma and used by military and health-related organizations to inform treatment planning for military veterans following the impact of trauma. Moral Injury (MI), on the other hand, is technically not a disorder (at this point in time) but is increasingly recognised as a syndrome which can have substantial effects on the health and well-being of military veterans (Koenig & Al Zaben 2021). Mounting research (particularly in the US, Canada, UK), as well as exploratory research in Australia (Hodgson and Carey, 2019; Jamieson et al 2021), has confirmed potentially morally injurious experiences (PMIEs) adversely affecting the mental health of military veterans. Currently, however, there



is some confusion as to what are the differences and similarities, if any, between PTSD and MI.

### Background

While there is currently no internationally agreed upon definition or official diagnostic criteria for MI, the Australian Defence Force (ADF) has proactively defined MI based upon current international research as: ‘...a trauma-related syndrome, caused by the physical, psychological, social and/or spiritual impact of grievous moral transgressions, or violations, of an individual’s deeply held moral beliefs and/or ethical standards’ (ADF, 2021). Core symptoms commonly identifiable are: (a) shame, (b) guilt, (c) a loss of trust in self, others, and/or transcendental/ ultimate beings, and (d) spiritual/ existential conflict including an ontological loss of meaning in life. Secondary symptomatic features often include (a) depression, (b) anxiety, (c) anger, (d) re-experiencing the moral conflict, (e) social problems, (f) relationship issues, and ultimately (g) self-harm – and potentially suicide. While some researchers regard the ADF definition of MI as being the “most comprehensive and inclusive definition of MI to date” (e.g., Buhagar, 2021, p. 3102), nevertheless determining the boundary between MI and PTSD is proving a challenging task for both researchers, clinicians, and other allied health carers (Carey & Hodgson, 2018).

### Purpose

This paper, in accordance with the conference theme (‘Planning for the Unexpected’) will present and discuss the current similarities and differences between MI and PTSD, so as to proactively assist medical, nursing, and allied health professionals in their further understanding of the relationship between the two mental health spheres. Using a bio-psycho-social-spiritual paradigm, this paper will also suggest some future and possibly unexpected criteria to be considered with respect to MI being incorporated into the DSM-VI.

### Method

Current literature and research with regard to the uniqueness of MI and PTSD, as well as the overlapping similarities between both, will be presented. In addition to the empirical evidence being noted regarding MI, various diagrams will be utilized to visually present both the distinct and overlapping factors between MI and PTSD, as well as proposed MI diagnostic criteria based on the work of Koenig et al (2023).

### Conclusion

Consideration of the current theoretical and empirical research literature, regarding the intersection

between MI and PTSD, is an important aspect that needs ongoing attention in order to effectively ensure the appropriate intervention of holistic care for the well-being of veterans.

References are available on request.

[This submission was cleared by: (1) Governance Support Officer, Directorate of Health Research, Health Protection and Policy, Joint Health Command; 03MAR23, and (2) Director, DSHW, Joint Health Command; 09MAR23].

### Biography:

**\*\*SQNDLR (Professor) Matthew Bambling, MPsych, PhD, RAAFSR.** Senior Air Force Psychologist, IWD RAAF Edinburgh; Professor of Psychology and Discipline Chair of Psychological Sciences, Australian College of Applied Professions; Associate Professor (Adjunct), Medical School, University of Queensland, Brisbane, Australia. (Presenting Author)

**\*\*Chaplain (WGCDR) Assoc. Prof. Lindsay B. Carey, MAppSc, PhD, RAAFSR,** is Research Director, Directorate of Spiritual Health and Wellbeing, Joint Health Command Australian Defence Force & Associate Professor (Adjunct) School of Psychology and Public Health, La Trobe University, Melbourne, Australia and the Institute of Ethics and Society, University of Notre Dame, Sydney, Australia. (\*Corresponding Author & Presenting Author).

**\*\*Dr. Nikki Jamieson, BSW, MS, PhD.** Assistant Director – National Suicide Prevention Programs, ADF Centre for Mental Health, Joint Health Command, HMAS Penguin, Balmoral, NSW. (Presenting Author).

**\*Professor Harold G. Koenig, MHSc, MD.,** Professor of Psychiatry & Behavioural Sciences and Associate Professor of Medicine and Director of the Center for Spirituality, Theology and Health, Duke University Medical Center, Durham, North Carolina, USA. (\*Non-presenting Author).

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## Nasal Disinfection as a Front-Line Defence in Future Pandemics

Prof Peter Friedland<sup>1</sup>

<sup>1</sup> University of Western Australia/Sir Charles Gairdner Hospital

The nasal cavity is the primary site of infection for SARS-CoV-2 and other highly pathogenic respiratory viruses. Nasal disinfection is an appropriate and logical extension of hand disinfection and PPE in the defence against pandemic viruses.

In particular, the presentation focuses on the potential of intranasal povidone-iodine (PVP-I) for

nasal disinfection. This topical microbicidal agent has been used for more than six decades in clinical practice for skin disinfection and antisepsis of wounds and burns. PVP-I is a uniquely appropriate nasal disinfectant. It is the only broad-spectrum microbicide that inactivates all viruses, but it is safe to use on mucous membranes at the right concentration and in the correct formulation. In addition, it has the significant added benefit of not inducing viral resistance.

Early into the pandemic, there was keen research interest in the potential of intranasal PVP-I to arrest viral shedding and intervene in COVID-19 disease progression and transmission. Since 2020, multiple published clinical trials have reported on the use of intranasal PVP-I in COVID-19.

There is no approved PVP-I nasal spray, so all the trials, apart from one, were conducted with research-stage formulations. The presentation identifies the technical barriers to developing a commercial PVP-I nasal spray.

There is one GMP-developed and regulatory-compliant PVP-I nasal spray (Nasodine Nasal Spray), and the history of this product's development over several years prior to the pandemic is presented, including the results of six clinical trials, including two trials targeting COVID-19.

One published pilot study assessed its pandemic potential, which showed a reduction in nasal shedding of SARS-CoV-2 after a single dose. The results of a randomised, controlled, multidose Phase II shedding study showed that when used eight times daily over three days, the product cleared the virus from the nasal passages in 100% of subjects by the fourth day.

COVID-19 will not be our last viral pandemic. While vaccination may be the preferred medium-term strategy for managing any pandemic, in the early stages, nasal disinfection with PVP-I can play a critical role in protecting healthcare workers and potentially reducing transmission in the general population.

### Biography:

*Peter Friedland is an Ear Nose and Throat surgeon at Sir Charles Gairdner Hospital and Joondalup Health Campus and the Garnett Passe Rodney Williams Professorial Chair in Otolaryngology-Head and Neck Surgery (OHNS) at UWA. He leads Australian and international human trials on the treatment and prevention of the common cold and COVID-19 viruses.*

*Friedland is the WA chairperson of the OHNS Regional Surgical Trainee Committee of the Royal Australasian*

*College of Surgeons. He holds memberships of the Australian Government Professional Services Review, the Panel of Clinical Experts of the Australian Department of Health and Ageing, Medical Benefits Scheme National ENT Taskforce, Australian Society of OHNS Board, an Editorial Board of the Australian Journal of Otolaryngology and founding Board Member of the Laryngology Society Australia. He has presented over 150 papers at national and international conferences and is Squadron Leader, No 1 Expeditionary Health Squadron, RAAF Amberley.*

*Prior to emigrating from South Africa in 2009, Friedland was clinical Head of Department of OHNS at Donald Gordon Medical Centre, Faculty of Health Sciences, University of Witwatersrand, South Africa. The highlight of his career was the privilege of attending Nelson Mandela for 9 years and learning invaluable lessons and insights at his bedside.*

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## Non-Specific Low Back Pain a 'Novel Approach': Looking at New Evidence to Manage an Old Problem

Dr Catherine Kelaher<sup>1</sup>

*1 Joint Health Command*

Low back pain is common, around one in six Australians report back problems and 80% experience back pain during their lives.<sup>1</sup> The prevalence of low back is increasing globally and this is a problem because it is often associated with considerable disability. Globally, low back pain is a leading cause of Years Lived with Disability (YLDs).<sup>2</sup> In 2017 it resulted in 64.9 million (95% UI: 46.5 million–87.4 million) YLDs, a 52.7% increase from 42.5 million (95% UI: 30.2 million–57.2 million) in 1990.<sup>3</sup> In Australia, it is the second most common reason for people to go to their GPs, and it is the most common reason for middle aged Australians to retire early and is the number one cause of lost productivity, early retirement and income poverty.<sup>4-6</sup>

Over the last six years, the ADF has averaged around 7000 unique presentations of back pain per year. Noting some caveats around denomination data, the estimated point prevalence equates to approximately 11.3% compared to 7.5% in the global population. (3) Of those presenting with back pain, 24% become non deployable, for those who return to a deployable category rehabilitation takes an average of 162 days. Over the last six years the number of ADF members being discharged with a diagnosis of back pain has increased year on year and back pain is the 5th most frequent DVA claim by defence members.

The increasing prevalence and associated burden of disability requires action. In my presentation, I propose to review recent guidance and emerging evidence in the field to support a comprehensive best practice approach to support management of Defence members with low back pain.

1. AIHW. Chronic Musculoskeletal Conditions: Back problems Canberra: AIHW; 2019 [Available from: <https://www.aihw.gov.au/reports/chronic-musculoskeletal-conditions/back-problems>].
2. Vos Tea. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*. 2017;390(10100):1211-59.
3. Wu A, March L, Zheng X, Huang J, Wang X, Zhao J, et al. Global low back pain prevalence and years lived with disability from 1990 to 2017: estimates from the Global Burden of Disease Study 2017. *Ann Transl Med*. 2020;8(6):299.
4. Britt H MG, Henderson J, Bayram C, Harrison C, Valenti L, Pan Y, Charles J, Pollack AJ, Wong, C, Gordon J. General practice activity in Australia 2015–16. . Sydney: General practice series no. 40. ; 2015.
5. Schofield DJ, Shrestha RN, Cunich M, Tanton R, Kelly S, Passey ME, et al. Lost productive life years caused by chronic conditions in Australians aged 45-64 years, 2010-2030. *Med J Aust*. 2015;203(6):260.e1-6.
6. Schofield DJ, Callander EJ, Shrestha RN, Percival R, Kelly SJ, Passey ME. Labor force participation and the influence of having back problems on income poverty in Australia. *Spine (Phila Pa 1976)*. 2012;37(13):1156-63.

### Biography:

*Catherine Kelaher is a fellow of the Australian Faculty of Occupational and Environmental Medicine and also the Royal Australian College of General Practitioners. Catherine worked with Health throughout the COVID-19 pandemic to help organizations to optimally manage risk related to SARS-CoV-2. Catherine served as a Medical Officer in the ARA and now works in Defence as a civilian. She is the Senior Occupational and Environmental Physician working to optimise the health and well being of Australia's Defence Force members, to prevent and manage work place illness and injury to support successful return to work and activity.*

## Nursing Workforce Shortages: What can the Australian Defence Force Learn From the Rural and Remote Nursing Workforce Experience?

CAPT Catherine Holland<sup>1</sup>

*1 2nd Health Battalion, 2 Brigade*

Similarly to the broader health systems context, the Australian Defence Force struggles to recruit and retain an adequately sized health workforce. The recently released Defence Strategic Review (2023) sets a clear focus for innovative and agile approaches to the recruitment and retention of the Australian Defence Force workforce to meet changing strategic challenges. It is thus imperative that the factors driving challenges with health workforce recruitment and retention within Defence are well understood, and addressed into the future.

To contribute to this undertaking, the author presents the findings of her 2022 structured scoping review paper which examines the perspectives, values and motivations of nurses in the rural and remote workforce in relation to recruitment, retention, and resignation. Nurses represent a substantial proportion of both the national and Australian Defence Force health workforce. Nurses commonly form the backbone of health care provision in Australian rural and remote settings where they are often the only health provider in the community. This is analogous to Australian Defence Force nurses who are also often required to practice remotely as independent practitioners when on deployment or exercise which parallels with the research area in many ways.

In the presentation, the nexus between the findings of this review in the Australian rural and remote nursing context to that of the Australian Defence Force health workforce is explored and important implications for future planning are highlighted. It is argued that, in order to plan strategic actions for strengthening the Australian Defence Force nursing workforce, research that examines the effects of global nursing workforce demand challenges on its own nursing recruitment and retention strategies is needed.

Arksey and O'Malley's methodological framework guided the scoping review drawn on in this presentation, which identified relevant Australian literature published between 2012 and 2022 on the professional values held by rural and remote nurses, and their perceptions and motivations to come to, stay in, and/or leave rural practice. The author synthesised and interpreted the research through

the lens of Cosgrave's Whole-of-Person Retention Framework for addressing healthcare workforce challenges in rural contexts. Six key areas that influence recruitment, retention and resignation were identified and are discussed here in reference to their utility in the Australian Defence Force context.

### Biography:

*CAPT Holland recently completed a Master of Advanced Practice Nursing (Health Professional Education) at the Queensland University of Technology (QUT), in which she wrote a paper for publication on recruitment, retention and resignation of rural and remote nurses. She is an Emergency and Primary Health Nurse who is passionate about education, training, clinical competence and governance, as well as sustaining the current health workforce.*

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## Occupational Audiometric Screening: Contemporary Best Practice For Assessing Noise Exposure in Aircrew and Other Defence Personnel

Dr Adrian Smith<sup>1</sup>, [Dr Benedict Whalley<sup>1</sup>](#)

<sup>1</sup> RAAF Institute of Aviation Medicine

Noise-induced hearing loss is a significant concern for aircrew, and aircrew commonly express concern about hazardous noise exposures and the need for improved hearing protection. In reviewing aircrew concerns about noise exposure amongst Hawk aircrew, IAM has identified a number of opportunities for improvement in the way noise exposure and hearing is assessed.

The Defence framework for occupational monitoring of hearing and noise exposure outlines two different audiometric protocols: 'periodic screening audiometry' and 'health monitoring audiometry'. Periodic screening audiometry aims to demonstrate the best-possible level of hearing as part of a periodic health examination, and is conducted after a noise-rest of at least 16 hours. By contrast, health monitoring audiometry is intended to identify a threshold shift that could indicate excessive exposure to noise or inadequate noise-control measures, and should be conducted as soon as practicable after a period of noise exposure. Where a threshold shift has been identified, a comprehensive occupationally-focussed history and examination is required to assess factors that may contribute to excessive noise exposure, including fit and function of hearing protection, exposure to ototoxic compounds or hand-arm vibration, and other additional sources of noise.

Potential confusion with the underlying requirements for periodic audiometric screening and health monitoring audiometry may lead to an ineffective audiometric surveillance program that is insensitive to temporary threshold shift that might be present immediately after exposure to hazardous levels of noise, and fail to provide an adequate surveillance mechanism for inadequate noise controls, ineffective hearing protection, or excessive noise exposure. Without this information, Commanders are unable to assess the effectiveness of existing noise-control measures, and aircrew may inadvertently be exposed to risk of noise-induced hearing loss.

IAM has developed Aeromedical Guidance for AVMOs and aircrew to outline the best practice for periodic screening audiometry and health monitoring audiometry. This presentation will discuss the optimum delivery of a comprehensive aircrew hearing conservation program, to ensure that potential hazardous exposure to noise is detected early enough to make effective changes to aircrew exposure and noise-control measures to minimise the risk of noise-induced hearing loss and optimise health and wellbeing of aircrew as part of our duty of care for Defence personnel operating in a noise-hazard environment.

### Biography:

*SQNLDR Benedict Whalley is a Registrar AVMO at the Institute of Aviation Medicine. He has been a uniformed Medical Officer in the RAAF since 2013. Over the past year, Benedict has been working primarily in the area of aviation safety - including reviewing the processes of how physiological episodes are investigated and reported.*

*Adrian Smith is an aviation medicine specialist with 20+ years of experience in the field, currently working in the role as Principal Advisor for IAM Aeromedical Analysis and Decision Support Flight.*



### Out of the Lab and Into the Battlefield: A Framework For Translation and Implementation of Human Sciences Into Defence Capability

Major Emma Williams<sup>1,2</sup>, Doctor Jace Drain<sup>3,4</sup>

<sup>1</sup> Australian Defence Force

<sup>2</sup> University of Canberra

<sup>3</sup> Defence Science and Technology Group

<sup>4</sup> Joint Health Command

Considerable research has been conducted over recent decades examining musculoskeletal injury, training stress and physical fitness in Defence personnel. Collectively, this research has involved considerable resources and generated significant knowledge, yet arguably has had limited impact. This reflects not so much the quality of research, but more the complex nature associated with translation of findings into practical application in the military setting. Unlike the mature processes that exist for introducing new capabilities into service, there is no systematic approach for translating human sciences research into action for Defence. This work proposes a conceptual framework to define the process of translating research into practice.

#### Method

Existing frameworks and process models from the field of implementation science and organisational change methods were reviewed, and consultation with military stakeholders was conducted to identify important elements crucial to successful translation.

**Results.** Development of a framework, comprising key considerations in each phase to support progression from the initial needs assessment through to the translation of research outcomes into practice, policy, and/or education.

The first phase, Planning, consists of an assessment of the need and feasibility of the proposed research. Key considerations are defining the problem, identifying target populations, feasibility of conducting the research, identifying appropriate military stakeholder sponsors, defining the desired end-state, and how research impact will be measured (e.g., how will the research outcomes help personnel to perform their job or role).

The second phase Execute/Evaluate covers all the elements of the research from conducting stakeholder engagement, data collection, analysis and reporting. Key considerations in this phase include: where the research will be conducted, identifying lessons from

past research, trials and field studies, identifying the maturity of the research outcomes to become part of routine organisational practices and policies, assessing whether the research outcomes are superior to the status quo (where baseline performance levels are known).

The third phase Maintain encompasses activities that transition research findings to 'business as usual'. Key considerations in this phase include having collaborative multidisciplinary teams, an evaluation feedback loop and ensuring end-users understand how to make use of the outputs, building in organisational capacity to resource the ongoing use of the outputs, and stakeholder reviews of ongoing effectiveness.

Integral to the process is the concept of the end user (i.e., soldiers and commanders) being involved at each phase of the model, and ensuring a clear potential benefit is articulated through-out the process. If the end user is working with researchers to develop the methodology from inception then more feasible, implementable and practicable outcomes will be delivered.

#### Conclusion

The process model can be used as an organising framework to define problems and provide solutions by translating knowledge from research into action. The model draws from best practices across different sciences to create an efficient and cohesive process for implementing research findings to improve human capacity and capability. In doing so, the human sciences community will not only be better postured to deliver research impact for Defence, but will inherently be integrated into the process, creating an efficient and cohesive process for implementing research findings from the lab to the battlefield.

#### Biography:

*Major Williams is the current Australian Army Senior Physiotherapist, and is part of the Technical Advisory Group in the 2nd Health Brigade. Her responsibilities include coordinating physical force preservation efforts and providing advice on musculoskeletal injury risk reduction and physical performance activities and research across Forces Command.*

*Major Williams completed her Bachelor of Physiotherapy at the University of Queensland in 2007, and holds a Graduate Certificate of Applied Clinical Epidemiology (Sports), and is completing a Master of Public Health.*

*Major Williams has held a variety clinical and staff officer roles during her 17-year military career. Most recently she spent three years in Human Performance*

roles, in both HQ Forces Command and as the lead Staff Officer for Human Performance in Army HQ. Major Williams' career has been highlighted by an operational deployment to Afghanistan in 2010, liaison roles with Australian Institute of Sport and Defence Science and Technology, and support to various ADF sports teams.

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### Prevalence of Long-Term Health Conditions in Current Serving, Previous Serving and Never Serving Australians: An Age-Adjusted Comparative Analysis Using 2021 Census Data

Mr Richard Beaton<sup>1</sup>, Dr Shahd Al-Janabi<sup>1</sup>, Dr Geordie McLeod<sup>1,2</sup>, Professor Caroline Finch<sup>3</sup>

<sup>1</sup> Department Of Defence

<sup>2</sup> School of Science, Edith Cowan University

<sup>3</sup> Chancellery, Edith Cowan University

Permission to publish abstract not granted. – Manuscript in preparation.

#### Biography:

*Richard is a data scientist at Joint Health Command where he works producing analytical products for internal reporting, working primarily in Python. Prior to working in Defence Richard worked on machine learning and econometric reporting in a number of Federal Departments and an economics thinktank. Richard obtained his undergraduate degree at the Australian National University in Computer Science.*

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### PTSD and Moral Injury: The Role of Just Cultures in Eliminating Psychosocial Risks In Personnel in High-Risk Environments

Rev. Mark Layson<sup>1</sup>, Dr Abilio de Almeida Neto<sup>2</sup>

<sup>1</sup> Charles Sturt University

<sup>2</sup> NSW Centre for Work Health and Safety

#### Background

There is an increasing awareness of psychological and existential distress in personnel serving in dangerous and austere environments. Federal Government inquiries in Australia have investigated defence and veteran suicides and increased rates of psychological harm among first responders (police, fire, and ambulance). Since its inception in the

1980's posttraumatic stress disorder (PTSD) has become a prevalent diagnosis of distress that arises from exposure to traumatic events. An emphasis on trauma exposure as the predominant cause of distress has led to the development of many secondary and tertiary intervention strategies which target individual personnel. Despite the large rollout of individual interventions, there is scant compelling evidence of significant decreases in reported rates of distress or suicide in military and first responder populations.

Since 2009 research on the new moral injury paradigm has been increasing by 50% year on year. Moral injury research posits a different aetiological process for the emergence of distress in military staff, and increasingly in medical staff and first responder populations. Moral injury includes the lasting biological, psychological, social, spiritual, and behavioural impacts of witnessing or failing to prevent morally challenging events, and/or a sense of organisational betrayal. Moral injury research highlights the relational, moral, and spiritual context of trauma exposure. Interventions to address moral injury hold out the hope of delivering truly primary prevention strategies by eliminating organisational and leadership betrayals. However, very few organisational and leadership interventions are currently utilised in high-threat environments.

#### Objective

The doctoral research presented firstly aimed to measure the presence of moral suffering in an Australian sample and then to operationalise the events and cultures that personnel perceive as betrayal and/or abandonment by leaders of organisations. In light of this data, it aimed to develop a bio-psychosocial-spiritual framework on which primary prevention strategies could be deployed. Interventions targeted at leadership and organisational culture so as to prevent moral injury and related conditions.

#### Methods

Mixed methods and interdisciplinary methodology utilised an extensive literature review, Bayesian Network analysis of survey data from 229 Australian first responders, narrative-oriented inquiry of auto/biographies and interviews with 16 Australian first responders, and a practical theological reflection. The final framework aligned with extant literature, research data, and spiritually informed practices to address identified harms.

#### Results

The quantitative analysis reported over 33% of participants perceived being betrayed by leaders or

organisations over 50 times in their careers. High levels of moral distress, moral injury and perceived injustice were reported. Higher levels of distress were associated with betrayal than with trauma exposure. The thematic analysis reported distress was associated with exposure to moral dilemmas associated with death, operational injustice, organisational injustice, poor resourcing, lack of leadership support, and poor recognition and reward.

### Conclusion

The harmful events and cultures that were reported are strongly aligned with nascent WHS psychosocial safety regulations that have been released in every Australian state and territory during 2022 and 2023. Therefore, to be compliant with new workplace safety laws, it is recommended that military and other high-threat occupations address moral injury through holistic organisational and leadership interventions alongside individual wellbeing interventions. This presentation will discuss the bio-psychosocial-spiritual framework that promotes the adoption of just cultures and the implementation of key leadership behaviours to eliminate psychosocial risk. Roles for multiple-discipline wellbeing teams are also discussed.

### Biography:

*Rev. Dr Layson's doctoral research developed a biopsychosocial-spiritual framework to prevent moral suffering in first responders. Mark is a former police officer and firefighter, who has been serving as an ambulance chaplain for 11 years. He also brings 20 years of pastoral experience as an ordained pastor and aged care chaplain. Mark has researched the implications of the moral philosophy of Richard Rorty, the moral psychology and Jonathan Haidt, while his doctoral thesis on moral injury in first responders is currently under examination. His lived experience of frontline trauma work, along with research interests in how moral frameworks are made, manipulated and broken inform his current research. His doctoral research at Charles Sturt University was done in partnership with the NSW Centre for WHS and explored the intersection of workplace safety, staff wellbeing, morality and spirituality. The research developed a holistic biopsychosocial-spiritual framework that enables primary preventative strategies to address moral suffering. Mark also serves on the Human Ethics Committee for the Australian Institute of Family Studies and has spoken about his research across Australia and internationally.*

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## Public Health in the Australian Defence Force: Essential for Maintaining Capability

CMDR Geethanjali (Geetha) Isaac-toua<sup>1</sup>

*1 Australian Defence Force*

Public health practice came into prominence and has played a major role during the COVID-19 pandemic. It is the science of protecting and improving the health of people and their communities. It affects Population Health which is defined as the health outcomes of a group of individuals. The Australian Defence Force (ADF) is a critical population whose health directly affects capability and mission success.

Public health practice, has been a corner stone of clinical practice in preventing disease, identifying the major causes of illness contributing to the burden of disease, prolonging life and promoting health. This in turn assists with prioritisation and planning for appropriate health services and health care that will affect population health.

This presentation will give an overview of the Australian Public Health System, including governance, legislation and notification requirements and the importance and relevance to the ADF.

The presentation will explore what is already done in the public health space within the ADF; where the responsibility for public health policy development and delivery sit; and how it can be applied in an individual clinician's practice. It will also explore how public health practice affects and influences Force Health Protection, Force Health Preservation and ADF capability.

The presentation will cover key aspects of public health practice, such as surveillance, good data collection and recording, prevention and prophylaxis and treatment. It will also address how clinicians can be supported to prevent, identify and manage population health issues within the ADF.

### Biography:

*CMDR Geetha Isaac-Toua is a Public Health Physician working as a Subject Matter Expert with Joint Health Command (JHC) and Joint Operations Command (JOC). She joined the Royal Australian Navy Reserves in 2017. She played a key role in supporting JHC and JOC during the COVID-19 pandemic.*

*CMDR Isaac-Toua has worked as Public Health Physician with the Australian Department of Health, the ACT and Southern NSW public health units and in the private sector. CMDR Isaac-Toua's main areas of*

interest are management of communicable diseases, disaster response, tropical medicine, travel medicine and rural remote health.

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### Remote Governance of Deployed Damage Control Surgical Teams - an Industry Partners Global Experience

Dr Jon Kendrew<sup>1</sup>

<sup>1</sup> Iqarus

Damage control resuscitation (DCR) and surgery (DCS) performed on patients who have sustained war injuries has historically been the domain of Military entities, Non-Governmental Organisations or self-funding charitable surgical teams working with established logistic, command and communications chains.

The deployed landscape is evolving rapidly, and we are witnessing a growing trend of organisations seeking external contracted solutions from industry to provide deployed surgery at reach in austere and remote locations. This paradigm shift necessitates robust clinical oversight of these remote teams to ensure the delivery of safe and effective care.

Iqarus, a wholly owned subsidiary of International SOS, is a pioneering independent healthcare provider that routinely deploys skilled surgeons, anaesthetists and specialised nurses to support our clients in the field. Our surgical teams operate in many of the world's most challenging and austere locations, often facing limited physical and clinical resource.

In order to facilitate the exchange of knowledge and ensure continuous improvement, Iqarus has embraced a simple internet communications platform. Through this platform, we have established a weekly global surgical forum, connecting our globally deployed staff engaged in DCS and DCR on our projects worldwide. This forum serves as a conduit for formal case presentations, discussion and the sharing of clinical insights. By harnessing this forum, we expedite the flow of knowledge, enabling swift learning from key clinical lessons. Furthermore, our staff actively engage in individual and collective learning, delivering clinical topic presentations and utilising online learning resources.

This podium presentation will explore the challenges of operating as a civilian entity in remote locations and the mechanisms we employ to provide remote, senior, clinical oversight ensuring the delivery of safe and quality care. Additionally, we will highlight the use of an innovative training programme which

plays a pivotal role in equipping our teams with the necessary skills and knowledge to excel in the field.

#### Biography:

Prior to joining Iqarus as a Regional Medical Director, Jon was a key clinician in the acute care pathway of the unprecedented number of casualties returning to the UK from Afghanistan, he quickly gained extensive operative experience in all echelons of military surgical care. From emergency war surgery on deployed operations at Camp Bastion Hospital to the acute life and limb saving surgery and subsequent delayed reconstruction of blast and gunshot injuries at the Queen Elizabeth Hospital Birmingham, he saw first-hand how the severity of injuries increased as the conflict became characterised by the use of ever more powerful IEDs. He has published papers on these war injuries, has presented his work both nationally and overseas, and has co-authored Orthopaedic chapters in several key textbooks. He has been an invited guest speaker at both the British and German Orthopaedic Society's, the British Trauma Society, the Orthopaedic Trauma Society and the Internationally renowned Edinburgh Trauma Symposium.

Kendrew is an Honorary Research Fellow at the Royal British Legion Centre for Blast Injury Studies at Imperial College London and sits on the CBIS Amputee Studies Advisory Board.

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### Returning To Aviation-Related Duties After Covid-19. Comparison of Old and New Aeromedical Guidance, and Lessons Learned for Future Policy Development

FLTLT Danielle Polgar<sup>1</sup>, Squaron Leader (Dr) Richard Costelloe<sup>1</sup>

<sup>1</sup> RAAF Institute of Aviation Medicine

#### Background

On 10 Jun 22, The RAAF Institute of Aviation Medicine (IAM) released updated Aeromedical Guidance for the return of Australian Defence Force (ADF) aircrew and controllers to aviation-related duties following COVID-19 infection. The updated guidance aimed to minimise operational impacts of COVID-19 by expediting a return to full duties, but accepted a higher level of medical risk (medium as opposed to low) compared with the previous guidance of January 2022. In particular, it was anticipated that the new guidance may encourage under-reporting of symptoms, as there was an operational incentive for aircrew and controllers to report asymptomatic as



opposed to symptomatic infection, as asymptomatic infections did not require a medical review prior to return to aviation-related duties. Asymptomatic individuals could instead resume full duties after completing a self-declaration form, countersigned by a flight commander.

### Methods

In order to assess the operational effects and potential risks associated with the change in guidance, an analysis was conducted of IAM's records of all aircrew and controllers who were returned to duties following COVID-19 infection from February to December 2022. These records were analysed to compare the reported disease severity (asymptomatic, mild, moderate, or severe) and time taken to return to full duties under the old guidance as opposed to the new guidance. Ethics approval for this project was granted by the Departments of Defence and Veterans' Affairs Human Research Ethics Committee.

### Results

Under both the old and new policies, 90% of aircrew and controllers returned to duty at the first medical assessment. However, as expected, return to aviation-related duties was faster under the new guidance compared to the previous guidance (16 days compared to 19 days). Of the 10% of individuals who did not return to duty after the first assessment, 50% reported ongoing ENT or respiratory symptoms, 22% reported neurocognitive impairment or fatigue, and 13% had cardiovascular issues including ECG changes, chest pain, or palpitations.

As expected, a greater percentage of infections were reported as asymptomatic under the new guidance compared to the previous (19.5% vs 5.9%). Possible explanations include the increased availability of rapid antigen testing (allowing for greater testing of asymptomatic individuals), the effects of immunisation and/or subsequent infections, changes to symptom profile between COVID-19 strains, and deliberate or inadvertent under-reporting of symptoms by individuals. A review of the aircrew self-declaration forms intended for use in asymptomatic individuals found that 45% were incorrectly completed.

### Conclusion

The change in aeromedical guidance achieved its aim in ensuring a faster return to aviation-related duties for aircrew and controllers. A greater percentage of infections were reported as asymptomatic under the new guidance. It is possible that the updated guidance may have encouraged under reporting of symptoms and therefore increase the aeromedical risk associated with COVID-19 infection in ADF

aircrew and controllers. However, to date, IAM is not aware of any ADF aviation incidents where COVID-19 infection or its sequelae were a contributing factor.

### Biography:

*FLTLT Danielle Polgar is a RAAF Aviation Medical Officer, currently posted to the RAAF Institute of Aviation Medicine at RAAF Base Edinburgh. FLTLT Polgar completed a fellowship of the Royal Australian College of General Practitioners (FRACGP) in 2019, and is currently a Registrar in the Australasian College of Aerospace Medicine (ACAsM) fellowship training program. FLTLT Polgar has previously served in aeromedical evacuation and expeditionary health squadrons and in 2020 was deployed to the Middle East in support of Operation ACCORDION.*

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## Smata Data: How Dental Data Optimised Service Delivery Following the Implementation of the Risk Based Dental Fitness Classification

LTCOL Anthony Craig<sup>1</sup>

*1 Joint Health Command*

The ADF Health Strategy has set out a number of pillars to enhance the delivery and effectiveness of health care to ADF members. Health system insights and smarter service delivery go hand in hand. Effective, timely, data driven decisions can lead to service delivery improvements and innovation. In early 2022, it was realised that there would be a need to conduct a considerable number of periodic dental examinations between the months of July and November. This was due to the implementation of the risk based dental fitness classification over the same period in 2020, as well as the interruption of dental services due the COVID-19 pandemic. Not only was 2022 looking like a concern, data revealed approximately 87% of members were receiving a PDE recall interval of 12 months. Therefore, there was the potential for a continued backlog of PDEs during the July to November period for years to come.

Data was gathered from the Health Information Office (HIO) to determine the number of PDEs due each month by facility. Facilities were advised to manage their appointment books to enable the peak of PDEs to be 'flattened out'. This process also resulted in a more even spread of treatment identified at the PDEs, ensuring satisfactory access to care was maintained. Over a twelve month period, the data supplied by the HIO was developed to incorporate other measures

that reflected current and future workload, as well as members' lived experience data.

This presentation will discuss how the data was analysed, developed and implemented in order to prevent a foreseeable issue with service delivery and access. It will also discuss how the initial scope of the project evolved to a business as usual process as well as how the information is utilised at a local and HQ level.

### Biography:

*LTCOL Craig was a sponsored undergraduate student and finished his undergraduate training in 2007 before completing a Master of Clinical Dentistry (Implant Dentistry) in 2013. He is a Fellow of the International College of Dentists as well as being the Head of Corps, Royal Australian Army Dental Corps. He is currently posted to the Directorate of Clinical Services, Garrison Health, Joint Health Command as the Staff Officer Grade 1, Dental. Previous postings have included 3rd Combat Service Support Battalion, 1st Health Support Battalion, 2nd General Health Battalion and Joint Health Unit – South Queensland. LTCOL Craig has deployed on OP Render Safe and has spent time providing dental services in Germany and Papua New Guinea on Exercises Long Look and Olgeta Warrior respectively. LTCOL Craig is a strong advocate for improving oral health outcomes for ADF members, especially through education and prevention. He appreciates all sports and the outdoors and enjoys spending time with his wife Daina and their three children.*

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## Strengthening Force Health Protection Through Integration and Interoperability

Major Melissa Zahra<sup>1</sup>

<sup>1</sup> Australian Army

Disease and Non Battle Injury (DNBI) form potentially the primary loss of manpower in any exercise or operation. The health threat information gathered during a Health Threat Assessment (HTA) directly informs the development of Force Health Protection and mitigation strategies to reduce the incidence of DNBI.

Mosquito borne diseases such as Ross River Virus (RRV) and Barmah Forest virus (BFV) are endemic to Australia. As they are part of the ecology, the risk of infection is unable to be eliminated they have the potential to reduce operational capability. Outbreaks of RRV were recorded during training exercises at Shoalwater Bay Training Area (SWBTA) in 2016

and 2017, with two outbreaks of Scrub Typhus, a bacterial infection transmitted by larval mites in Cowley Beach Training Area (CBTA) in 2022. In 2022, several outbreaks of Japanese Encephalitis Virus (JEV) around Australia led to the declaration of a communicable disease incident of national significance.

Prior to Exercise Talisman Sabre 2023 (EX TS23), the Army Hazard Assessment Team (HAT), in conjunction with Australian Defence Force Malaria and Infectious Diseases Institute (ADFMIDI) Arbovirology Department, US Public Health Command-Pacific (US PHC-P) deployed to CBTA and SWBTA and undertook a Health Surveillance Activity focusing on vector bone diseases. This activity's primary aim was to develop a real-time HTA of CBTA and SWBTA for Commanders of both the Australian and US forces.

The Health Surveillance Activity also allowed the Army HAT the opportunity to collaborate with scientific colleagues ADFMIDI the US PHC-P IOT share skills and knowledge of different trapping methods for mosquitoes, ticks and mites, identification of the various vectors and the use of molecular techniques in the field environment including molecular amplification and next generation sequencing (MinION). The collaborative work helped to develop a robust deployable workflow procedure able to be used by all three capabilities.

The collaboration and cross pollination of skill and knowledge attained during this activity opens the doors for future integration and interoperability.

### Biography:

*MAJ Zahra started her working career as a Hospital Scientist in a Microbiology and Infectious Diseases Laboratory then worked as an Application specialist for BioMérieux Australia. In 2014 she enlisted into the Australian Regular Army as an Environmental Health Officer (EHO). During her time at the 1st Preventative Medicine Company deployed on OP Render Safe and Ex Olgetta Warrior, worked with the Army Environmental Monitoring Group along with the Marine Corps Environmental Services Division on several Ex TS. In 2019 MAJ Zahra deployed as the SO3 Health on Ex Bersama Lima and posted as the company 2IC. Whilst in this role, she provided technical advice in environmental health and occupational hygiene to broader Defence. To enhance her scientific knowledge and skills in 2020, posted to the ADFMIDI. MAJ Zahra is currently the OIC of the Hazard Assessment Team.*

*MAJ Zahra has graduated from the University of Western Sydney with a Bachelor of Science; Flinders University with a Graduate Diploma in Environmental Health Practice; University of Wollongong with a*

*Graduate Certificate in Work Health and Safety (Occupational Hygiene) and the University Queensland Master of Public Health (Global Health).*

*MAJ Zahra is currently the Secretary of Environmental Health Australia (Queensland) Incorporated.*

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### Surgical Facility Guidelines for the Management of Military Casualties after Extended Duration Limb Tourniquet Application

Dr Patrick Weinrauch<sup>1</sup>

*1 2nd Health Battalion*

Tourniquet application is a universally accepted lifesaving emergency intervention for the pre-hospital management of catastrophic limb haemorrhage. Application of arterial tourniquets for short durations of time is consistently safe in relation to local tissue ischaemia, limb salvage rates and the systemic metabolic impacts upon reperfusion.

Delivery of future ready medical care within the Australian Defence Force needs to consider operational environments where casualty evacuation is delayed for multiple reasons including contested evacuation asset manoeuvre, extended evacuation distances, resource limitations and tactical constraints. Prolonged Field Care (PFC) of a casualty with a limb tourniquet applied over an extended time duration for the management of life threatening catastrophic haemorrhage creates unique clinical management issues that impact upon all levels of health care delivery. Tourniquet time correlates with ischaemic limb injury and is therefore associated not only with decreasing rates of limb viability and functional recovery but also with increasing systemic and metabolic impacts upon tourniquet release and subsequent reperfusion. Extended duration tourniquet application therefore represents a concern across all levels of health care provision as it impacts upon pre-hospital and initial emergency care, decisions relating to surgical and anaesthesia management and post-surgical care including intensive care and pharmaceutical protocols.

This paper delivers clinical management recommendations for surgical facility health care providers in the management of casualties where extended duration limb tourniquet application has been necessary. The guidance statements have been developed by comprehensive literature review including collateral information drawn from multiple models that demonstrate pathophysiologic and clinical similarities in respect of limb ischemia,

reperfusion injury and systemic metabolic consequence. Guidance statements are provided with Class of Recommendation Strength (COR) and Level of Evidence (LOE) stratification according to the American College of Cardiology (ACC)/ American Heart Association (AHA) clinical guidance recommendation system.

Recommendations discussed within this presentation are as follows:

1. Primary limb amputation is to be conducted after warm ischaemia time of greater than 6 hours (Recommendation Strength: 1; Level of Evidence: C-LD).
2. Limb salvage procedures are to be conducted with situational awareness of the tactical environment (Recommendation Strength: 1; Level of Evidence: C-EO).
3. Limb re-vascularisation requires proactive resuscitation (Recommendation Strength: 1; Level of Evidence: C-LD).
4. Tourniquet removal is only to be conducted after suitable resuscitative conditions have been obtained (Recommendation Strength: 1; Level of Evidence: B-NR).
5. Tourniquet removal is an elective procedure to be conducted in controlled conditions (Recommendation Strength: 1; Level of Evidence: C-EO).
6. Fasciotomy is to be conducted in limbs after ischaemic injury (Recommendation Strength: 1; Level of Evidence: C-LD).
7. Suitable tissues from amputated limbs may be considered for subsequent reconstructive surgery (Recommendation Strength: 2B; Level of Evidence: C-EO).
8. Staged tourniquet release techniques are to be considered to minimise metabolic consequences (Recommendation Strength: 2B; Level of Evidence: C-LD).
9. Renal monitoring and protection measures are to be instituted (Recommendation Strength: 1; Level of Evidence: B-NR).
10. Adjunctive therapies to improve limb salvage rates should be considered (Recommendation Strength: 2B; Level of Evidence: C-LD).

This presentation is part two of a two part series. The accompanying first part presents recommended PFC guidelines for management of casualties who require extended duration limb tourniquet application prior to transfer to a surgical facility.

### Biography:

*Orthopaedic Surgeon*

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### Symposium: Applying Science to Preventing the Onset and Persistence of Mental Ill Health in the Australian Defence Force

Professor Jennifer Wild<sup>1</sup>

*<sup>1</sup> Department of Defence*

As the nature of warfare evolves so too must the approach to keeping members well. This symposium presents a series of four talks focused on applying science to preventing the onset and persistence of mental ill health in the ADF. The first talk, given by Prof Jennifer Wild, presents the systematic approach she and her team have taken to determine the research priorities for mental health and wellbeing that sit within the Research Health Framework 2021-2025. Through a six month process of analysing survey data, reviewing the latest research, running think tank workshops with Defence members and then academic experts, two priority areas emerged informed by 5-year objectives that prioritise recovery and prevention of mental ill health. A programmatic research approach is being undertaken to address the priority areas. The study that kick starts the research investigates what members want in terms of treatment for specific symptoms and why. Dr Zoe Jenkins will present this study which has a secondary aim of determining the relative contribution of fear of negative evaluation and the drive to self-rely on members' treatment choices. The results are critical for refining evidence-based communication tools to target emerging symptoms and the language that will be used to describe them, which is the topic of the third presentation given by Dr Jenkins. Finally, Prof Wild will present a transdiagnostic coaching intervention that demonstrates efficacy in preventing PTSD and depression in university-trained first responders and how this relates to members.

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### Symposium: Determining the Research Priorities for Mental Health and Wellbeing Within Defence

Professor J Wild<sup>1</sup>

*<sup>1</sup> Department of Defence*

This talk describes the systematic approach that has been applied to developing the mental health

research priorities for Defence's Health Research Framework. The process began one year ago at the AMMA 2022 where the Director of Health Research presented on Defence's Health Research Priorities. As part of his keynote, audience members were invited to input their suggested priorities for mental health and wellbeing. The inputs were analysed, distilling a number of themes which informed questions to pose to Defence members and academic experts in workshops in order to identify research gaps and needs. Following each think tank, the emergent themes were identified and attendees met again to rank each theme. The themes were cross referenced with five year objectives aimed to improve recovery and prevention of mental ill health for the ADF. The process identified two top priorities, which will be presented in this talk and the programmatic research plans designed to achieve them.

### Biography:

Jennifer Wild is Professor of Military Mental Health at the Department of Defence and Phoenix Australia, University of Melbourne. She holds affiliate status at the University of Oxford where she developed evidence-based interventions to prevent PTSD and depression in high risk occupations. Her area of expertise is in developing and evaluating evidence-based interventions for anxiety and stress disorders, and in developing preventative interventions for people at risk of trauma, such as emergency responders and military members. Prof Wild is leading a program of research focused on preventing the onset and persistence of mental health problems. She has worked in an advisory role to the Cabinet Office in the UK on best practice for developing preventative interventions for high risk occupations. She has co-developed internet-delivered cognitive therapy for military veterans, an evidence-based programme borne out of cognitive therapy for PTSD, a first-line treatment for PTSD recommended by international guidelines. She has written over 80 publications and two books, including a recently published popular science book on resilience, *Be Extraordinary: 7 Key Skills to Transform Your Life from Ordinary to Extraordinary*. Prof Wild regularly appears in the media giving advice rooted in science for preventing the persistence of trauma-related mental health problems.



### Symposium: Evidence-Based Communication to Target Emerging Symptoms of Mental Ill Health

Dr Zoe Jenkins<sup>1</sup>

<sup>1</sup> Department of Defence

Recent research suggests it is possible to teach individuals working in high-risk occupations tools to reduce the frequency and severity of emerging symptoms of mental health disorders and may be effective in averting the trajectory to disorder onset. Drawn from recommended evidence-based treatments for PTSD, anxiety, and depression, these tools modify transdiagnostic risk factors. Within the ADF, longitudinal and qualitative research has identified a number of potential risk factors for later mental health difficulties that could be targeted with such tools. In this programme of work, a series of videos will be produced which will teach members how to treat emerging symptoms of PTSD, depression and anxiety. The videos will build on previous evidence by targeting emerging symptoms of mental ill health identified in the Wellness Action Through Checking Health (WATCH) Project and the modifiable risk factors (such as sleep problems, poor use of social support, anger and self-blame appraisals) identified in the Longitudinal ADF Study Evaluating Resilience. Modifiable risk factors drawn from relevant external translational research will also be targeted in the communication. The language used to describe common symptoms and preferred treatments highlighted in the videos will be informed by the feedback received in the 'Treatment Preferences Study'. The aim of this programme of work is to target emerging symptoms of mental ill health to support the preparedness of members.

#### Biography:

*Dr Zoe Jenkins works within the Directorate of Health Research in Joint Health Command as the Assistant Director for Mental Health Research. She is working with Prof Wild to develop and implement a five-year programme of research within the mental health and wellbeing domain at Defence.*

### Symposium: Preventing Post-Traumatic Stress and Depression: What Works and Why?

Professor Jennifer Wild<sup>1</sup>

<sup>1</sup> Department of Defence

Research demonstrates that certain characteristics increase the risk of developing mental health problems once an individual is exposed to trauma. These can be divided into fixed factors that cannot be changed and modifiable factors, which are amenable to change with training. For members, fixed factors associated with increased risk of later mental ill health include early adversity, such as childhood trauma, fewer years spent in formal education, and past psychological disorders. Modifiable factors associated with later difficulties include cognitive processes, such as dwelling about the past, unhelpful thoughts about resilience, and anger, as well as poor social support and sleep problems. This talk presents internet-delivered cognitive training in resilience (iCT-R), which was designed to target modifiable predictors of PTSD and depression in newly recruited paramedics. iCT-R targets rumination and low resilience appraisals in a six-session supported online intervention. A randomised controlled trial was conducted in which 570 student paramedics were recruited from 19 universities across England and randomly allocated to iCT-R or to supported online training of widely available education resources or to standard practice. The primary outcome was SCID-5 assessed PTSD and Major Depression at one year follow-up and was analysed using mixed-effects logistic regression. iCT-R was associated with significantly lower rates of PTSD and Major Depression at 1 year follow-up compared to supported alternative training ( $p=0.04$ ) and to standard practice ( $p=0.02$ ). This is the first study conducted with a high risk occupation to demonstrate intervention efficacy in preventing PTSD and major depression and has significant translational relevance. The study demonstrates that it is possible to prevent PTSD and depression in high risk occupations, that a programmatic approach to developing preventative interventions is essential and that psychoeducation, even when supported with a coach, is ineffective for reducing rates of psychopathology. Results are discussed with reference to research identifying the commonalities of effective interventions.

#### Biography:

*Jennifer Wild is Professor of Military Mental Health at the Department of Defence and Phoenix Australia, University of Melbourne. She holds affiliate status*

at the University of Oxford where she developed evidence-based interventions to prevent PTSD and depression in high risk occupations. Her area of expertise is in developing and evaluating evidence-based interventions for anxiety and stress disorders, and in developing preventative interventions for people at risk of trauma, such as emergency responders and military members. Prof Wild is leading a program of research focused on preventing the onset and persistence of mental health problems. She has worked in an advisory role to the Cabinet Office in the UK on best practice for developing preventative interventions for high risk occupations. She has co-developed internet-delivered cognitive therapy for military veterans, an evidence-based programme borne out of cognitive therapy for PTSD, a first-line treatment for PTSD recommended by international guidelines. She has written over 80 publications and two books, including a recently published popular science book on resilience, *Be Extraordinary: 7 Key Skills to Transform Your Life from Ordinary to Extraordinary*. Prof Wild regularly appears in the media giving advice rooted in science for preventing the persistence of trauma-related mental health problems.

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### Symposium: Treatment Preferences for Mental Health Support Among Serving Members

Dr Zoe Jenkins<sup>1</sup>

<sup>1</sup> Department of Defence

Common perception suggests that members prefer to self-manage mental health symptoms to avoid being downgraded and to avoid uncomfortable trauma-focused work where relevant. However, there are no data to support this. The nature of warfare is evolving and there is a need to ensure greater numbers of members are deployable. Preventing the onset and persistence of mental health disorders as well as facilitating recovery from them improves Defence's ability to deploy members. This means (1) targeting early symptoms to avoid disorder onset and (2) ensuring treatment is sought early in the lifecycle of a disorder to improve recovery and avoid health loss. Identifying treatment preferences (including a preference for symptom self-management) and reasons associated with preferences directly informs messaging that can be developed as part of a broader programme of work designed to achieve the prevention of and early recovery from mental health problems. This talk presents the study that has been designed to determine members' treatment preferences for specific sets of symptoms and why.

The study will determine the relative contribution of the drive to self-rely on treatment choices and fear of negative evaluation, the results of which will guide the language used to adapt evidence-based tools to a military context in order to target emergent symptoms of mental ill health.

#### Biography:

Dr Zoe Jenkins works within the Directorate of Health Research in Joint Health Command as the Assistant Director for Mental Health Research. She is working with Prof Wild to develop and implement a five year programme of research within the mental health and wellbeing domain at Defence

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### The Australian Defence Force Alcohol, Tobacco, and Other Drug Program and its Implementation Within an Australian Military Population

Ms Kylie Druett<sup>1</sup>

<sup>1</sup> Joint Health Command

The ADF has a long history of supporting members to address their alcohol use from a health perspective. In fact, records dating back to 1970 and the 80s detail the establishment of the Alcohol Rehabilitation and Education Program and the Navy Alcohol and other Drug Service. At the turn of the century (2001) the Alcohol, Tobacco and other Drug Programme was formally stood up and until this day it is responsible for the development, management and evaluation of the Alcohol Management Strategy and the strategic and tactical elements of the Program that support members to identify or address their ATOD use.

In this presentation the elements of the Alcohol, Tobacco and other Drugs Program will be described along with the evidence base that underpins the Program such as the principles of harm minimisation, the Ottawa Charter and the Kirkpatrick framework for evaluation. Opportunities and challenges for implementing these type of programs in an ADF workforce will also be discussed.

#### Biography:

Kylie Druett is the Assistant Director of Mental Health Programs – Alcohol Tobacco and other Drugs for the Australian Defence Force and is a registered psychologist. Ms Druett has experience working in a number of clinical settings leading clinical mental health and drug and alcohol treatment and population health teams. Ms Druett has been a member of NSW

*Health Consultative Reference Group for the review of the Drug and Alcohol Psychosocial Interventions Practice Guidelines and in 2015 placed 1st place NSW Health Quality Award in the Western Sydney zone for a project that improved access to services for drug and alcohol consumers. In 2021 she received a Blacktown City Council Local Hero award in recognition of her volunteer work partnering with families bereaved by domestic violence homicides. 2023 her project Domestic Violence Memorial Grove was a finalist in the category of 'Community Based Initiative of the Year' at the Australian Parks and Leisure Awards.*

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### The Australian Defence Force Centre for Mental Health Addiction Medicine Specialist Pilot Project

Dr Duncan Wallace<sup>1</sup>, MAJ Nikola Ognyenovits<sup>1</sup>

*1 ADF Centre for Mental Health, Joint Health Command*

We describe the development and first twelve months of operation of an addiction medicine specialist pilot project to provide expert services for members with substance use disorders and to demonstrate the effectiveness and importance of this speciality to Defence Health personnel.

#### Biography:

*MAJ Ognyenovits is an Addiction Medicine Specialist Physician. He has a strong interest in the clinical management and research in substance use disorders, behavioural addictions and associated mental health conditions, including complex developmental trauma, PTSD, depression and anxiety disorders.*

*MAJ Ognyenovits is a Fellow of the Royal Australasian College of Physicians' Chapter of Addiction Medicine. He is involved in advocacy to inform drug policy and service development.*

*MAJ Ognyenovits joined the ADF in Darwin in 2003. He was initially attached to Norforce as a Specialist Reserve Medical Officer. Since 2022 he has been working with the ADF Centre for Mental Health in the Addiction Medicine Specialist Clinic pilot project.*

*Currently he is working as a Staff Specialist in Metro North Alcohol and Drugs Service and in private practice. Dr Ognyenovits' main interest in research is the exploration of novel approaches to addiction treatment.*

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### The Challenges of Navigating an International Medevac

Dr Paul Hanley<sup>1,2</sup>

*1 Fellowship of Australasian College Emergency Medicine (FACEM)*

*2 Fellowship of the Royal Australian College of General Practitioners (FRACGP)*

Permission to publish abstract not granted.

#### Biography:

*Dr Paul Hanley holds the roles of Medical Director and Prehospital Specialist Retrieval Doctor at CareFlight. He is an Emergency Physician at Nepean and Blue Mountains District ANZAC Memorial Hospital (Katoomba) Hospitals.*

*Paul is also a Major in the Royal Australian Army Medical Corps and has been deployed to Afghanistan, for Bushfire Assist and COVID 19 Assist. He has been deployed to Bangladesh for the International Committee of the Red Cross (ICRC). Paul is currently posted to 1/5 Health Service Company, 2 Health Battalion.*

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### The Command & Control of Health: Finding the Right System

Major Rohan Kain<sup>1</sup>, Major Peter Zimmermann<sup>1</sup>, Maj Matthew Middleton

*1 1st Health Battalion, Australian Army*

Command and control (C2) is critical to mission success, and is always central to mission failure. Despite this, very little time is devoted within health discussing and evolving C2 systems that meet the complex needs of a specialist capability and the variable relationships with combat elements across the battlespace. This is particularly relevant given the Defence Strategic Review and the raising of the 2nd Health Brigade – all significantly altering the Health C2 landscape.

This article highlights the limitations of the traditional C2 approach within the Combat Health Operating System (CHOS). It explores the opportunities to enhance Health C2 systems by adopting the approaches and language of other supporting operating systems with similar variable remits across the battlespace such as Offensive Support and Mobility & Survivability.

Health C2 has atrophied due to a combination of factors. These include the nature and size of operations (up to Battle-Group size); partner nation support; limited casualty numbers (real/simulated);

civilian contracting; and, limiting employment to WHITEFOR and small scale teams due to workforce constraints. With a focus on planning and preparing for large-scale operations, it is critical to look to emerging C2 concepts as the basis of Health C2.

The ADF Concept for Command & Control of the Future Force proposes a central theme: "Hierarchal Command - Agile Control". It offers the following definitions:

**Command.** The authority that a military member lawfully exercises through rank or appointment to determine what is to be achieved by subordinate forces.

**Control.** The act of coordinating forces towards outcomes determined by Command. Control is undertaken by elements that integrate the actions of forces necessary to achieve Command intent.

**Agile Control.** An Agile Control system can proactively transition between centralised or decentralised relationship models to optimise force integration for the operating environment and mission

Health elements operate across the entire battlespace. Whilst this creates the illusion of a coordinated system to provide health effects, there is no Unity of Command. Health C2 relationships are variable and are often outsourced to chance, such as combat commanders who share proximity with the health element. C2 is often not formally established, but the descriptors when used are the traditional OPCON, TACON or TACOMD.

These descriptors constrain the adaptability and flexibility of Health Officers to employ, re-balance and weight health elements during the conduct of combat operations by introducing unnecessary frictions. We propose that designing a system consistent with 'Hierarchal Command - Agile Control' will establish Health Officers as those best placed to support combat commanders in controlling the deployed health capabilities supporting their respective part of the battlespace. To achieve this requires evolving the language used for Health C2.

This does not require new concepts or language. Using familiar terms contained in Offensive Support and Mobility & Survivability doctrine such as 'direct support', 'reinforcing' and 'directed [BOS] task' will provide clarity to both combat commanders and Health Officers. These provide control and coordination measures between health elements and others within the battlespace.

The task-oriented deployable health capabilities that provide support from the Platoon to Divisional level mirror the employment of Artillery and Engineering capabilities. The C2 systems for both offer a variable

model of assignment, such as 'attached' using traditional C2 language, or 'allotted' to perform tactical tasks. This would create opportunity for the employment of Health Officers during operations to exercise Agile Control across the battlespace, akin to that of the Officers within an Artillery/Engineering Regiment.

By looking at C2 systems and language beyond the traditional manoeuvre unit, health will be able to exercise Agile Control of a critical and finite enabler. Evolving Health C2 will better place health elements to play their part in achieving mission success.

### Biography:

*"MAJ Rohan Kain graduated from the Royal Military College – Duntroon in 2012 to the Royal Australian Army Medical Corps. He has fulfilled command, staff and instructional appointments across a variety of Units including, 1 CHB, 1 RTB, HQJOC, RMC-Duntroon and 1 HB. He is currently the Officer Commanding, 8 Close Health Company in Darwin as part of the 1st Health Battalion".*

*Major Middleton is the Senior Medical Officer 8 Close Health Company, 1st Health Battalion. Before becoming an Army Medical Officer he was a Combat Engineer.*

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## The Development of an Operational Clinical Skillset for Deployed Intensive Care Physicians, With Reference to Case Experiences

LTCOL Jonathan Begley<sup>1,2,3</sup>, WGCDR Florian Pracher<sup>4,5,6</sup>, MAJ Adam Mahoney<sup>1,7</sup>, BRIG Michael Reade<sup>8,9,10</sup>

1 Headquarters 2nd Health Brigade

2 Central Clinical School, Monash University

3 Intensive Care Unit, The Alfred Hospital

4 Headquarters Health Services Wing

5 Intensive Care Unit and Anaesthesia; Townsville University Hospital

6 Charles Darwin University

7 Trauma Service, Royal Hobart Hospital

8 Medical School; University of Queensland

9 Joint Health Command

10 Department of Intensive Care Medicine; Royal Brisbane and Women's Hospital

Deployed military clinicians face challenges and circumstances unfamiliar to their civilian colleagues; this extends to intensive care physicians (intensivists). Like other medical specialists, military intensivists



are trained in accordance with civilian curriculums in civilian hospitals and receive comparatively little military-specific clinical training. While work has been done to define the training gap between civilian and military practice for surgeons, similar work for intensivists has been lacking. We describe three clinical cases managed by deployed intensivists which highlight some of the clinical challenges faced on deployment, and then go on to describe the development of an operational clinical skillset for military intensivists. This operational clinical skillset may prove useful to organisations and individuals in identifying training gaps for deployable clinicians.

In East Timor, a child presented with skull fractures and a severe head injury after falling from a coconut tree. Diagnostic facilities are often limited in the most forward deployed hospitals, increasing reliance on good clinical medicine and pragmatic decision making. In the absence of advanced imaging or neurosurgical capability, the child was treated for presumed global cerebral oedema and general principals of head injury management were followed. The child was extubated after four days and made a full neurological recovery.

In Rwanda, a United Nations soldier presented with bacterial meningitis and signs of rising intracranial pressure progressing to uncal herniation. Deployed equipment and subspecialty surgical expertise was not available, necessitating creative problem solving. A surgeon performed a burr hole and placed a feeding tube into the lateral ventricle to function as an external ventricular drain, using a bile drainage bag as a closed drainage system. This was used to measure and control intracranial pressure for 48 hours, after which the soldier was awoken and made a gradual recovery.<sup>1</sup> On a similar note, in the absence of deployable renal replacement therapy improvised peritoneal dialysis has been used to manage renal failure on deployment.

In Bougainville, a small child presented with an unknown infectious illness. Complicating matters, the child was a close relative of the secessionist leader. Managing small children in military hospitals equipped for adults remains a challenge for most of the world's deployed military clinicians. When the child developed a pneumothorax and no paediatric intercostal catheters were available, an endotracheal tube was used for this purpose. A head box was constructed of coat hangers and cling film for post-extubation management.<sup>2</sup>

We sought to define an operational clinical skillset and define the scope of practice for military intensive care physicians. We performed a systematic literature review of five databases for both quantitative and

qualitative articles relevant to deployed intensive care units.

We identified several studies which described patterns of battle injuries. Non-combat-related injuries including a wide range of medical conditions were also commonly managed in deployed intensive care units. Paediatric patients were frequently admitted with high rates of severe injuries and high in-hospital mortality.

Several qualitative articles outlined general characteristics of critically ill military patients. Important topics included infections in a deployed environment, particularly tropical diseases and drug-resistant organisms. Legal and ethical decision-making specific to the military context also featured. Intracranial pressure monitoring, ultrasound, and renal replacement therapy in the deployed environment were discussed in several articles.

We were able to identify skills that deployed intensivists requires beyond their standard civilian clinical expertise and generate a comprehensive operational skillset for military intensive care physicians.<sup>3</sup> We hope our work may assist individuals and organisations to identify and develop suitable training pathways to best prepare clinicians for the specific requirements of deployment.

1. Harding et al. 1996. doi.  
[org/10.1177/0310057x9602400417](https://doi.org/10.1177/0310057x9602400417).
2. Farrow. Frontline Patient Safety. 2019.
3. Mahoney, Begley, Reade, Pracher. 2023. JMVH.

### Biography:

*Jonathan is an intensive care physician and anaesthetist in the Regular Army. Jonathan joined the Army Reserve in 2011 and completed his anaesthesia specialty training in 2017. He worked as an anaesthetist in Wagga Wagga, NSW, before joining the Army Medical Specialist Program (MSP) in 2020 to undertake intensive care specialty training. He works clinically in The Alfred Hospital intensive care unit. Jonathan has training in adult education and public health; he holds a Graduate Diploma of Education and the Master of Public Health Sidney Sax Medal. A long time ago he worked as an outdoor education instructor.*

*Brigadier Reade is the Joint Health Command Professor of Military Medicine and Surgery, leading a research program focussed on trauma systems design, blood and fluid resuscitation, and traumatic brain injury. He was DG Health Reserve – Army from 2019-2021 and Director of Clinical Services of the 2nd General Health Battalion 2015-2018. A specialist*

anaesthetist and intensivist, his clinical practice is at the Royal Brisbane and Women's and Ipswich Hospitals. He is Director of the Greater Brisbane Clinical School of the University of Queensland.

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### The Force Behind The Force – Supporting the Health of Whanau in the NZDF

COL Clare Bennett<sup>1</sup>

*1 New Zealand Defence Force*

Military families provide the backbone behind our military forces. A lot has changed about the demographics and needs of our families, as too has the military environment and broader social context.

This presentation draws on the findings of the NZDF Military Partners Survey completed in 2022 and broader comparative research across other five eyes nations. It examines the evolving nature of the perceived benefits and challenges experienced through family service life, impacts on wellbeing, perceptions about support, and support for future partner service. The presentation will conclude with recommendations to help maintain family wellbeing and maintain family commitment to military service.

#### Biography:

Colonel Bennett is a Psychologist with the New Zealand Defence Force. She has served in a variety of operational, research, policy and strategy roles. Most recently she has been the Chief Mental Health Officer and now the Director of Integrated Wellbeing in the Directorate of Health. She is a graduate of the NZDF Command and Staff College, holds post graduate qualifications in Psychology, Business and Strategy, and is a Member of the NZ Order of Merit (MNZM).

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### The Role of the Nurse and MEDTECH in the ADF Aviation Medicine Continuum of Care

FLTLT Elizabeth McCullough<sup>1</sup>

*1 Institute of Aviation Medicine*

Garrison Health Support and Operational Health Support are essential for the projection of military effects in Australia and on Operations. ADF Nursing Officers (NURS) and Medical Technicians (MEDTECH) conduct a range of important functions which support decision makers in Aviation Safety and work as force multipliers for deployed health operations. They work closely with Aviation Medical Officers in the Aviation Medicine Continuum of Care

and their competence and confidence is influenced by their familiarity with the aviation environment as well as Aviation Medicine policy and procedures. The Aviation Nursing Course at the Institute of Aviation Medicine provides NURS and MEDTECH's with in-depth, evidence based, up to date education and experience in military aviation medicine.

It is essential for ADF Health Professionals to be well educated in the nuances of the different ADF occupations and the interplay between health and occupation. NURS and MEDTECHs, as clinical leaders, need to be aware of the unique conditions of deployment and the availability of healthcare in deployed locations. All ADF Health Professionals should be afforded the opportunity to gain first-hand experience in multiple different ADF workplaces as well as accurate representations of the deployed environment. FLTLT McCullough will discuss the roles of NURS and MEDTECHs in the ADF Aviation Medicine Continuum of Care. She will explore the education offered at IAM and the opportunities for NURS and MEDTECHs to gain further experience in military aviation medicine.

#### Biography:

FLTLT Liz McCullough is a Aviation Nursing Officer currently posted to the RAAF Institute of Aviation Medicine.

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### The Tyranny of Distance - Building the Recovery Trajectory For Those Who Serve from a Western Australian perspective

Dr Richard Magtengaard<sup>1</sup>

*1 Resolute - For Those Who Serve*

Resolute has constructed and is executing a comprehensive approach toward integrating high-quality, trauma-informed clinical services across Australia. Importantly, this collaborative system of care places the individual and their supporters at the centre of decision-making, thus ensuring autonomy and self-agency are maintained.

Western Australia, covering the entire western third of the country, mostly comprises the arid Outback. Its population is concentrated in its fertile southwest corner, and this includes the riverside capital Perth, where the great majority of specialist supports exist.

Many ADF personnel and Reservists devote years to serving their communities. Most undertake these roles with the knowledge of the associated risks, out of a desire to help others in times of need.

The tyranny of distance can add great challenges to the timely and evidence-based provision of care and support, for those serving their community in both regional and remote jurisdictions.

With a solution focussed approach in mind, this presentation speaks to the argument for change, and outlines those key strategies being adopted in WA, allowing us to move past a current healthcare system that remains detached and struggles to serve the very people it has been built to help.

### Biography:

*Dr Richard Magtengaard is a Consultant Psychiatrist with near 25 years of clinical and administrative experience, originating from working within the Public Mental Health arenas, later moving onto establish a broad set of interests within the Private Practice and Not For Profit setting.*

*Dr Magtengaard served for 10 years as a Commissioned Officer (Bridge/Harbour Watchkeeping and Navigation) within the Royal Australian Navy, before retiring to complete his Postgraduate Degree within Medicine (MBBS).*

*Richard is currently the Director of the Military Trauma Recovery Programme across 2 busy sites of care, namely Bethesda Clinic (a 75 bed Tier 1 DVA Accredited private hospital in Cockburn, Perth) and ANZAC House Veteran Central (an interdisciplinary setting for specialist care within the CBD of Perth).*

*This programme remains dedicated to assisting Defence Personnel, our Veterans, and their families who have sustained physical and psychological traumas during the performance of their duties.*

*Richard values his role as a member of Open Arms' National Advisory Committee, and also St John Ambulance Expert Advisory Group. He remains an active member of the Australasian Military Medical Association (AMMA) and has developed lasting affiliations with ADF Joint Health Command (JHC), Returned Services League WA (RSLWA) and ANZAC House Veteran Central.*

## The Use of Telemedicine Software to Provide Clinical Reach-back to Aid Decision Making in Ukraine

Surgeon Lieutenant Commander Gerard Mcknight<sup>1</sup>, Lieutenant Colonel Serhii

Tertyshnyi<sup>4</sup>, Professor Tetyana Chaychenko<sup>5</sup>, Lieutenant Colonel Richard Booker<sup>6</sup>, Colonel Doug Bowley<sup>1</sup>, Professor Vitaliy Makarov<sup>5</sup>

<sup>1</sup> Academic Department of Military Surgery and Trauma

<sup>2</sup> Cardiff University

<sup>3</sup> Humanitarian Surgery Initiative

<sup>4</sup> Military Medical Clinical Centre of the Southern Region

<sup>5</sup> Kharkiv National Medical University

<sup>6</sup> jHubMed

### Introduction

The invasion of Ukraine by Russia commenced on 24 February 2022. By early January 2023, The United Nations' Office of the High Commissioner for Human Rights recorded nearly 18,000 civilian Ukrainian casualties. Death and injury rates among Ukrainian Armed Forces remain high.

Due to the nature of peer-peer conflict in Ukraine, all health workers have been called upon to treat large volumes of complex trauma patients. Some clinicians have received no specialist training in combat trauma care and had no prior relevant experience. To provide an accessible tele-medicine option, a clinical reach-back service has been developed linking clinicians in Kharkiv and Odessa to the UK's Defence Medical Services (DMS) and the Royal College of Surgeons of England.

### Methods

An online request is submitted using Microsoft Forms with data held securely on the Royal College of Surgeons of England's database. This request is then transferred to a secure clinical messaging mobile application (Pando, Forward Clinical, UK) and sent to a panel of relevant clinicians who receive a notification and relevant clinical information (including images) on their hand-held personal electronic device. Once an initial discussion has been held between suitably experienced UK-based clinicians, and a recommendation of realistic, achievable clinical options have been agreed, an online MDT is held using Microsoft Teams, supported by a clinically experienced English-speaking interpreter.

Use of a smartphone-based messaging application enables specialists to rapidly situate themselves to the deployed clinical problem, and agree availability for the initial MDT, faster than would be possible if

an alternative system (such as email) had been used. The same messaging application is already in use by deployed UK DMS clinicians, achieving median response times of under 10 mins for a deployed clinician to connect to specialist advice.

### Results

The model to provide clinical advice within relevant timelines has been proven, and the first 4 patients discussed are reported. Patient 1 was a 32-year-old male who had developed traumatic pancreatitis after a blast injury. He was 6 weeks post-injury and had a persistent mid-cervical post-tracheostomy fistula. Following the MDT discussion, a conservative treatment plan was agreed. This prevented the patient undergoing an unnecessary operation and preserved operating room capacity for other urgent cases.

Patient 2 was a 33 year old male suffering with sudden loss of vision after a blast injury. Discussion with a UK DMS Ophthalmic surgeon helped to confirm the diagnosis of psychological visual loss and helped develop a plan to demonstrate this to the patient to aid recovery.

Patient 3 was a 46 year old male who suffered a gunshot wound to the left thorax and after life-saving Damage Control Surgery (DCS) developed a bronchio-enteric fistula. After discussion with UK NHS and DMS clinicians, a thoracoplasty and Latissimus Dorsi flap was recommended.

Patient 4 was a male who suffered a thoracic blast injury from a kamikaze drone attack. After DCS and multiple debridements the patient had a persistent non healing wound despite 4 months of appropriate treatment. The mixed military-civilian MDT recommended resection of the ribs fragments from the thoracic cavity followed by a Lattismus Dorsi flap.

### Conclusion

This proof of concept has shown that commercially available software can be used in combination to provide a responsive clinical reach-back service in times of war.

This system can 'close the sophistication gap' by enabling injured Service Personnel to receive specialist input into their care even when far forward, such as in Role 1 or Role 2 Medical Treatment Facilities. This system is currently in use and could be adapted for use in the wider UK or NATO Armed Forces to project specialist medical care far forward.

### Biography:

*I am a Specialist Registrar in General Surgery. Since joining the Royal Navy in 2015 I have deployed with 3 Commando Brigade across the world including to the British Virgin Islands as part of the UK's humanitarian response on Op RUMAN. My clinical interest are Trauma, Emergency General Surgery and Global Surgery and I am currently conducting research into the use technology to improve surgical training in low resource settings. Additionally, I am undertaking a Humanitarian Surgery Innovation Fellowship with the Royal College of Surgeons of England.*

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## Topic: Working with the Military in Challenging Environments: Lessons Learned

Dr Judy Swann<sup>1</sup>, Dr Mark Parrish<sup>1</sup>

*1 International SOS*

International SOS, through its Iqarus subsidiary, provides expeditionary medical services projects in many of the world's most remote and challenging operating environments including Sudan, Ukraine, South Sudan, DRC, Afghanistan, Mali, Somalia, Sudan, northern Nigeria and northern Mozambique. We have considerable experience of delivering damage control surgery (DCS) and the full spectrum of other medical capabilities, with over 130 field staff currently delivering DCS capabilities in conflict affected parts of the world. Over 90% of our surgical cases have been as a consequence of combat related injuries. Examples include:

- Afghanistan: UN Assistance (UNAMA)-Afghanistan. Forward Surgical Team (FST), 4 positions, 2022-;
- Mali: UN Peacekeeping (MINUSMA)-Mali. Turnkey R2F (DCS), 7 positions, 2019-current; EU Training Mission-Mali. Tactically mobile turnkey R2F (DCS), 7 clinical positions, 2017-current; EU Training Mission-Mali. Turnkey R2E (DCS), 40 clinical positions, 2020-current; Swedish Armed Forces-Mali. DCS and ICU teams integrated into the Swedish Armed Forces R2, 6 clinical positions, 2017-2020.
- Kosovo: NATO-Kosovo. Turnkey R2B (DCS), 23 clinical positions, 2017-current.
- Somalia: EU Training Mission-Somalia. R2B (DCS), 10 clinical positions, 2018-current; UN Support Mission-Somalia (UNSOS). UN Level II (DCS), 25 clinical positions, 2012- 2018.



- Mozambique: EU Training Mission-Mozambique. R1 and R2F (DCS) capabilities, , 2021 – current.
- Oman: UK Armed Forces-Oman. Integrated R2F (DCS), 7 clinical positions, 2021 – 2022.
- Niger: Belgian Armed Forces-Niger. Moveable turnkey R2F (DCS), 7 clinical positions, 2020-current.
- USA: Department of Defence-US. Four “Field Hospitals”, rapidly deployed and established within US military bases to care for over 43,000 Afghan evacuees, over 1,200 clinical positions, 2021 – current.

Providing the clinical care to patients is often the most straightforward part of these deployments. We have learned many lessons from delivering these capabilities, from ensuring the right fit of personnel with appropriate skills both from a health and military sense; scaling supply to demand with a variety of staffing structures from 100% contractor to full integration with military teams; training and transferring knowledge and skills; providing continuity of care; undertaking research and development of new technologies, treatments and procedures; and providing high quality care and clinical governance in remote environments with little support and communications while understanding local and country cultural norms and requirements.

### Biography:

*Dr Mark Parrish is International SOS' Regional Medical Director in ANZ and the Pacific. His background includes positions in the Royal Australian Navy and Royal Navy including the Antarctic, Arabian Gulf, Caribbean, Mediterranean and Pacific; coverage of the Asia and Middle East regions for Microsoft's Health Software business; healthcare consulting with IBM Global Business Services; CEO of North Shore Private Hospital; and General Manager of Hornsby Hospital, NSW.*

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## Training Toward RACGP Fellowship - How the RACGP is Supporting ADF Registrars

Dr Rebecca Lock<sup>1</sup>, Dr Karin Jodlowski-Tan<sup>1</sup>, Associate Professor Michael Clements<sup>1,2</sup>

<sup>1</sup> RACGP

<sup>2</sup> James Cook University

In February 2023 the RACGP became responsible for delivering Australian General Practice Training (AGPT). The RACGP recognises that registrars with commitments to the ADF are vulnerable to

complexities during training due to competing responsibilities including those to their defence force service, their AGPT program requirements and often a civilian workplace. These additional demands on registrars serving with the ADF mean that as a cohort, additional support and training flexibility is required.

The RACGP has created several layers of additional support at a national, regional, and local level. This includes, at the local and regional levels, medical educators and training coordinators with specialised skills, support structures and contextual understanding and at the national level, the development of a working group to ensure policy caters for the needs of ADF registrars, and nationally consistent application of policy. We have also developed a series of registrar activities to support ADF trainees, including case discussion groups to develop clinical reasoning and exam skills in a supported peer group learning environment, coordination with GP registrar advocates to provide a forum for registrars to experience mentorship, opportunities to debrief to support wellbeing and the ability to bring concerns to the training team leadership.

In addition to these operational supports to training, there is strategic support and oversight at the RACGP board level as a commitment to these improvements for RACGP registrars.

We are developing a curriculum for an additional rural skill in Military Medicine that may be undertaken as part of an RACGP-RG. We have also developed closer working relationships with each of the defence force services and will continue to strive to facilitate best outcomes for ADF general practice registrars.

### Biography:

*Dr Rebecca Lock is a GP and medical educator. In addition to her role as National Lead Medical Educator -ADF, she is the National Assessment Advisor for the clinical competency exam. Rebecca has been working with ADF registrars since 2017 providing pastoral and training advice.*

*Dr Karin Jodlowski-Tan is a rural GP and medical educator. She is the National Deputy Director of Training - Rural Pathways and has led the college in development of the RACGP-RG curriculum and implementation.*

*A/Prof Michael Clements is a Townsville based General Practitioner and practice owner with a background in health leadership and clinical and corporate governance and he is the RACGP Rural Faculty Chair and on Board of the RAGCP. A/Prof Clements remains in the RAAF Reserves having*

*been in the PAF with postings to Tindal, RAF Henlow and Townsville. Michael is an Honorary Associate Professor with James Cook University.*

### Transfusion of Low Titre Group O Whole Blood in Combat: Lessons Learned from US and Coalition Forces in Operation Iraqi Freedom and Operation Enduring Freedom

LTCOL James X Gray<sup>1</sup>

*1 Australian Army*

In November 2021, Committee on TCCC recommended the following for the combat casualty, who is in haemorrhagic shock and requires fluid resuscitation. TCCC designates cold stored low-titre group O whole blood (CS-LTOWB) as the preferred resuscitation fluid, with fresh LTOWB identified as the first alternate if CS-LTOWB is not available. This recommendation arose from accumulating evidence demonstrating improved survival outcomes after severe trauma in patients transfused with whole blood in addition to component therapy, compared to component therapy alone.

The US Armed Forces Medical Examiner reviewed all combat deaths, 4596 battlefield fatalities, 4016 (87%) of all injury mortality occurred prior to reaching a medical treatment facility, and of these, 976 (24%) were deemed potentially survivable. (Ref 1)

Uncontrolled haemorrhage results in loss of clotting factors, loss of platelets, hypo-perfusion, shock, endothelial tissue damage, acidosis, hypothermia and resulting coagulopathy, represents the most common cause of preventable death following major trauma. Aggressive control of trauma induced coagulopathy (TIC) has been associated with improved survival. Damage control resuscitation (DCR) was developed to treat intravascular volume deficits, the acute coagulopathy of trauma, preserve oxygen-carrying capacity, repair the endothelium, prevent dilutional coagulopathy.

US Army forward surgical teams (FSTs) perform the DCR and damage control surgery (DCS). The FST provide a surgical capability to a manoeuvring combat brigade, consist of twenty personnel, often divided to distribute the surgical care capability more widely. Patients who received fresh whole blood (FWB) along with RBCs and FFP, had significantly improved survival compared with those who received RBCs and FFP without FWB. Transfusion of FWB in far forward operational setting was safe and it also improves outcomes. No difference in mortality

between patients receiving un-crossmatched group O FWB compared with group specific FWB. (Ref 2)

Retrospective review of blood product utilization trends, compiled from US Armed Services Blood Program (ASBP), data collected during operations from 2014 through 2021, saw introduction of new products, driven by changes in the Joint Trauma System clinical practice guidelines, that result from evolution in transfusion practices. Supply and demand for LTOWB from 2016 to 2020 increased by 21-fold at its peak in 2020. Testing of type O donations for anti-A and anti-B titre levels requiring titres less than 1/256. In 2017, ASBP began to transition to the use of Citrate-Phosphate-Dextrose-Adenine (CPDA-1) anticoagulant bag sets, which provide LTOWB a 35-day shelf life. Gradual increase in transfusion of cold stored LTOWB as the usage of FWB decreased in both Iraq and Afghanistan. The number of LTOWB units ordered in Theatre reaches 55% of all RBC containing products and overtakes the demand for Red Blood Cells (RBCs) in 2021. Whole blood is now the number one requested blood product from trauma care providers on the battlefield. (Ref 3)

Whole blood collection risk mitigation in USA, includes pre-deployment donor screening, use of rapid tests for donor screening of infectious disease and the post-transfusion surveillance of patients who received non-FDA approved blood products. Whole blood collection may also be a risk mitigation to advanced weapon systems capable of denying coalition forces air superiority and thus rapid casualty evacuation and logistical support to far-forward medical facilities. (Ref 3)

Many civilian trauma centres across USA and Canada are using cold stored LTOWB in the pre-hospital phase of severe trauma management. TCCC recommends cold stored LTOWB as the preferred resuscitation fluid, with fresh LTOWB identified as the first alternate if CS-LTOWB is not available.

#### References

1. Eastridge et al. Journal of Trauma & Acute Care Surgery, Vol 73, Num 6, Supp 5, pp S431-437.
2. Nessen et al. Transfusion, 2013. Volume 53 Supplement, pages 107S – 113S.
3. Taylor et al. Transfusion. 2022;62:S167–S176.

#### Biography:

*LTCOL Gray is a member of ADF (SERCAT 5), 2nd Health Battalion and is a member of ADF Blood Transfusion Committee. In civilian employment, Dr Gray is a consultant Haematologist and PhD molecular biologist. He works at Toowoomba Base*

*Hospital as a clinician, treats blood cancers, and is a member of the Darling Downs Transfusion committee responsible for establishing Major Haemorrhage Transfusion Protocols.*

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### Trauma Recovery Treatment for Female Veterans

Ms Karen Burns<sup>1</sup>

*1 St John Of God Health Care*

Service related trauma among women is a complex and multifaceted issue that warrants careful attention and understanding. This presentation aims to demonstrate the unique and lived experience of women who have encountered trauma while serving in the military and other first responder roles. By examining the specific challenges faced by women in these professions, and the pathways to treatment, we can explore the impacts of service related trauma on mental health and wellbeing and overall quality of life.

This presentation will include both clinical and lived experience speakers, and explore the gender dynamics and gendered experience of trauma. Service related trauma could occur in workplace environments that support a predominately male workforce. This dynamic can contribute to experiences of power imbalances and gender based discrimination, which can exacerbate trauma and hinder recovery.

The presentation will explore the importance of creating safe and supportive environments for women who have encountered service related trauma, as well as strategies to enhance prevention and early identification. Additionally, we will discuss the significance of de-stigmatising mental health concerns and the provision of accessible and gender sensitive treatment and support services for women affected by trauma.

The Female Trauma Program is an emerging evidence based treatment program that enables female veterans to manage gender specific experiences of trauma, trauma symptoms, increase distress tolerance and coping skills, and guide them towards moving forward in their lives in a meaningful way.

According to the Australian Institute of Health and Welfare (2020), compared with the Australian population, suicide rates (after adjusting for age) between 1997 and 2020 were: 27% higher for ex-serving Australian Defence Force (ADF) males but a staggering 107% (or 2.07 times) higher for ex-serving ADF females. This statistic thereby indicates a need for targeting intervention for the female veterans.

SJOG Female Veterans Trauma Program is designed to address single or complex trauma, and multiple discrete events in the life of female veterans. This program will aim to give female veterans coping skills to manage trauma symptoms, including understanding triggers, managing anxiety and unique aspects of veteran trauma including anger-resentments due to injustice-betrayal, and self-blame. The female trauma program is also aimed at addressing interpersonal factors such a relationship and communication patterns.

Karen Burns will deliver this presentation from a clinical and lived experience perspective, providing an example of how co designing and co-planning individual treatment journeys and service design can optimise choices for clients. Information presented is obtained through survey and focus groups with female veterans and first responders, as well as personal lived experience.

#### Biography:

*Karen Burns is Director Strategy and Engagement, St John of God Health Care, and clinician with qualifications in nursing and psychology. Karen is former CEO Uniting Recovery, former Chairperson NSW Mental Health Coordinating Council and former chairperson Community Council, and Deputy Commissioner of NSW Mental Health Commission. Also Board member of the NSW Service for the Treatment and Rehabilitation of Torture and Trauma Survivors.*

*Karen is passionate about co-design of models of care that make a difference and adapt to the needs of people and communities who use them, with inclusion of people with lived experience.*

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### Upstream Military Suicide Prevention: Extending Wingman-Connect From Technical Training to Operational Bases

Dr Peter Wyman<sup>1</sup>, Dr. Tony Pisani<sup>1</sup>, Mr. Bryan Yates<sup>1</sup>, Dr. Chris Goode<sup>2</sup>

*1 University of Rochester Medical Center*

*2 United States Air Force*

The Wingman Connect Program is a population-oriented universal suicide prevention program developed with the US Air Force (USAF). Wingman Connect entails group interactive training for USAF personnel, followed by text messages and base-wide activities to embed concepts into culture and peer networks. Using our research team's network health

framework (Wyman et al 2019; Wyman et al 2020; Wyman et al 2022), Wingman Connect strengthens two suicide-protective functions of relationship networks: (1) Positive social bonds and (2) Shared healthy coping norms.

We tested the efficacy of this program in a cluster RCT of 215 technical training classes (n=1485 Airmen) randomly assigned to either Wingman Connect or an active control (Wyman et al 2020). Wingman-Connect trained Airmen reported lower suicide risk and depression at end of technical training school. These Airmen were also 50% less likely to report corrective training.

We presented key results from this RCT at last year's AMMA conference. This year, we will report on data-driven development and piloting we recently completed to extend the program onto operational AF bases.

After technical training, Airmen transfer to their first operational base, considered the beginning of an Air Force career. In this phase of work, the research team tailored Wingman Space for this next career phase and developed an implementation strategy based on the EPIS framework (Aarons, Hurlburt, & Horowitz 2011) and EPIS developer Dr. Greg Aarons was added to the team. Wingman is delivered in a new peer network, the First Term Airmen Course (FTAC), a week-long requirement within 3-4 months after arrival at a new base.

To tailor Wingman Connect for operational bases, establish acceptability/feasibility, and develop implementation tools, the USAF selected 3 bases from a single major command. The Wingman Connect Program was delivered to 348 Airmen in 13 First Term Airmen Course cycles. The curriculum was tailored to this next career phase in cycles 1-4. Program modifications addressed new stressors from this major transition (i.e., work demands) and evolving opportunities to expand social networks (e.g., bring dependents). In cycles 5-13, evaluation of Airmen response, and trainer fidelity, and the implementation package was developed.

We will present results from this phase of research as well as several compelling video clips from interviews with Airmen about their experience with the program. Results were as follows:

- Reach: 96.3% of all First-Term Airmen in the 13 FTAC cycles completed WC training (N=348).
- Content Retained: 94.1% retained key Wingman Connect concepts based on write-in responses post-training.

- Relevant/Useful: Airmen rated Wingman Connect as relevant, 95.9% post-training and 90.1% after 1 month; and useful ("I feel better prepared to strengthen my relationships"), 91.6% at post-training and 90.2% at 1-month.
- Adoption: 92.4% post-training agreed "will use my Wingman Connect training to grow my goals and purpose." After 1 month, 89.1% indicated: "I have used Wingman-Connect skills to strengthen a relationship."
- Wingman Connect Built New Social Bonds: 93.5% of Airmen identified 1 or more FTAC classmate as a valued connection post-training (M= 2.38); 96.7% identified at least 1 valued connection after 1 month. (M=1.97).
- Trainer Fidelity. Coders rated 5 of 22 modules using Wingman Connect Adherence Checklist: mean adherence was 94.8%.

Wingman Connect is the first universal prevention program to reduce suicidal ideation and depression symptoms in a general USAF population. Group training that builds cohesive, healthy military units is promising for upstream suicide prevention.

Rigorous testing of the program across career phases in the operational Air Force is in progress, measuring prevention impact on suicide attempts and deaths. Adaptation and piloting in non-military environments, including police, religious communities, and urban youth sports is ongoing.

### Biography:

*Dr. Tony Pisani is a Professor of Psychiatry and Pediatrics at the Center for the Study and Prevention of Suicide at the University of Rochester, and the founder of SafeSide Prevention. His career is devoted to preventing suicide and promoting wellbeing. His work spans the continuum from upstream research in schools and the military to clinical interventions in health settings.*

*Dr. Peter Wyman leads the Network Health Prevention Science Program, where his work is at the intersection of behavioural science, developmental epidemiology, and social network methods. He has tested 'network health' interventions for diverse populations, including young adults in the military.*

*Mr. Bryan Yates is the Director of Operations for Military Programs, leading project logistics at the University of Rochester. Yates served 6 years as a US Army combat medic (deployed to Iraq and Afghanistan) and 9 years in the Army Reserves.*

*Dr. Chris Goode is a social psychologist and Branch Chief of the R&D Division for Headquarters of the USAF Integrated Resilience Directorate. He authored*



numerous peer-reviewed articles and influential government reports. His team oversees primary prevention programs with the aim of decreasing self-harm across the USAF.

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### What is Tension Pneumothorax and How is it Managed?

Dr Ben Butson<sup>1</sup>

<sup>1</sup> Directorate of Army Health

Tension Pneumothorax is a life threatening syndrome which requires emergent clinical management. But experienced clinicians understand that it is exceedingly rare and sometimes difficult to diagnose in real world pre-hospital practice. This is especially true for spontaneously breathing patients as opposed to patients receiving positive pressure ventilation. Conversely, it is ubiquitous in training scenarios involving military trauma and especially chest trauma, to the extent that there is a real risk that current Tactical Care of Combat Casualty training is emphasising this condition almost to the exclusion of other, more common, threats to life. This presentation seeks to challenge some of the dogma which has become entrenched in trauma training in recent decades, and to analyse the historical research and experience that has driven current understanding. The role of 'chest decompression', the methods to achieve this, and the important treatment goals for managing tension pneumothorax are examined. An evidence based case is made to reject suggestions in the literature and within the ADF to further expand treatment protocols for Medical Technicians and Combat First Aiders to include 'finger thoracostomy'.

#### Biography:

*Dr Ben Butson is a senior Emergency and Retrieval Physician based in Townsville. He is the Director of Northern Operations for LifeFlight Retrieval Medicine and a Senior Staff Specialist at the Townsville University Hospital and the Mt Isa Base Hospital. His civilian work entails a mix of retrieval medicine, including paediatric intensive care retrievals, as well as emergency medicine and anaesthetics. He is a Colonel in the Army Reserve and has served on multiple operational deployments over a career spanning 35 years. He has professional interests in pre-hospital medicine and trauma care and is a foundation member of the Court of Examiners for the Australasian College For Emergency Medicine Diploma of Pre-hospital and Retrieval Medicine.*

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### What's Blood Got to do With it: How Soldiers Bleed to Death

Dr Julie Doherty<sup>1</sup>

<sup>1</sup> ADF

It has been estimated from previous conflicts that 90% of combat injuries in infantry soldiers were caused by penetrating trauma. Death was mainly caused by fragments from explosive munitions, and less frequently by bullets, that penetrate and destroy soft tissues, bones and organs. Wounds of the dead were mainly in the head and torso compared to predominantly soft tissue and bone injuries in casualties that survived. About 50% of casualties with penetrating trauma die due to exsanguination, mostly due to injuries in the torso, but a fifth of deaths were attributed to trauma in the neck, large soft tissue areas and the limbs. Most fatalities occurred before casualties were able to reach medical attention which illustrates the challenge for military health planners to reduce mortality from combat wounds.

There are approximately five litres of blood circulating in the average human body, and shock begins after a litre of blood has been lost. It is imperative bleeding is stopped, as casualties are unlikely to be able to be saved after losing three litres of blood. This means that death would occur two hours after the point of injury at a rate of bleeding of 25mL/min. This equates to losing the volume of blood that would fill a coke can every 13 minutes, or a unit of whole blood every 18 minutes. However, death will be much quicker with certain injuries, such as a major arterial bleed which could cause exsanguination within 2-3 minutes. Mechanisms of injury such as dismemberment, decapitation and other catastrophic injuries will cause death instantaneously, and death may not be preventable with thoracic vascular injuries or high velocity abdominal pelvic injuries.

However, studies have shown that exsanguinating haemorrhage is the leading cause of potentially survivable combat injuries. Eastridge et al showed that 90% of clinically preventable deaths over 10 years of conflict were caused by non-compressible haemorrhage. Most casualties bled to death from injuries to the trunk, and around another third of fatalities were due to exsanguination from either junctional or peripheral wounds. These deaths were potentially preventable if they could have been treated with blood, and a massive blood transfusion is estimated to be required in around 15% of casualties with severe trauma. However, the Australian Army currently has no blood products available forward of the R2E. We need to start planning now to ensure

that we can perform blood transfusions at the point of injury in future conflicts in order to save the lives of our soldiers.

### Biography:

*MAJ Julie Doherty is a medical officer in the Australian Army and a qualified GP. She currently works as senior medical officer at 2 HB in Brisbane, where she is heading up a project on pre-hospital blood. Her previous posting was in tropical Townsville, and she has supported exercises in PNG and the Pilbara. She came to medicine and military late in life, previously working in Finance in the UK.*

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## Women's Health in the ADF – A Model for Improving Care to Serve the Individual and the Organisation

Dr Tara Kinnane<sup>1</sup>

<sup>1</sup> Royal Australian Air Force

As of 2021, women make up ~20% of the Australian Defence Force (ADF). Within the three services, the proportion of women is 15.1%, 23% and 25.4% in the Royal Australian Army, Navy and Air Force, respectively. The ADF is committed to increasing female representation within Defence and an important element of this is providing healthcare that is accessible and appropriate to the health needs of women.

There is growing evidence that women face unique challenges when it comes to healthcare including a disproportionate delay in diagnosis, over-prescribing and insufficient investigation of symptoms. Women's health addresses specific issues including sexual health and screening, reproductive health, contraception, antenatal and postnatal care and management of menopause. Studies, which looked at the health of women in the US military, have also highlighted that serving women face health challenges distinct from their civilian counterparts. This includes urogenital infections, higher rates of unintended pregnancy, post-partum psychological and physical fitness requirements, sexual harassment, and assault. One of the contributing factors for this is limited or delayed access to care in the deployed environment. Inadequate or insensitive care leads to avoidance of the healthcare system and poorer health outcomes including mental health. Whilst the ADF is significantly smaller, these findings are reflective of the challenges that our own female members face.

Furthermore, the geopolitical climate has led to increased requirement for short notice to move

operations, which require gender sensitivity. It is increasingly becoming recognised that within regions affected by conflict and natural disaster, the most vulnerable members of society include women. This is particularly reflected in association with their health and this was particularly evident during the Afghanistan Non-Combatant Evacuation in 2021. Medical officers, nursing officers and medical technicians are expected to have a breadth of knowledge regarding healthcare in the deployed environment and be able to utilise their skills with limited resources.

The healthcare system should be a force enabler through health prevention and management to ensure members are fit for duty both at their home location and in the operational environment. With the release of the Defence Strategic Report, this is highlighted through recognition that Defence has significant workforce challenges that must be met with innovative and sustainable approaches.

There is opportunity and responsibility for the ADF to improve its women's health services to meet these needs for the benefit of the individual members as well as the organisation. These benefits include increased retention of women in the ADF and improved care aimed at reducing the disproportionate rates of reduced duty days in females compared to males. Furthermore, there are potential financial benefits through reduction of unnecessary specialist referrals, as well as developing a more skilled workforce that could be utilised in both the Garrison and deployed environments. This presentation will outline a model for Women's Health Care that builds on an initiative developed by FLTLT Joanne Mackson at Richmond Health Centre. I will highlight the benefits and how this might be implemented at other health centres. I will also suggest an enduring model that could provide a systemic solution to managing Women's Health within the ADF that has not been sustainable in the past due to competing priorities.

### Biography:

*FLTLT Kinnane joined the RAAF in 2012 as a part of the Graduate Medical Program and studied medicine at Griffith University. Her first posting was to 1EHS Det TVL from JAN 2018 to JAN 2020. During this posting she participated in multiple exercises including Regimen White 19, Talisman Sabre 19, Thor's Hammer, High Sierra and Black Dagger. She also deployed on Operation APEC ASSIST 18 and was the AVMO/AEOO on Pacific Island Forum 19.*

*She then posted to 3AMES Det AMB from JAN 2020 to JAN 2023. During this time she completed her General Practice Fellowship with RACGP. She also deployed as*

*AEEO on Operation ACCORDION. She participated in multiple exercises including Regimen White 21, Cope North 22 and RIMPAC 22. She conducted multiple AMEs, as well as being Health Liaison Officer on a mission to Landstuhl, Germany during her time at 3AMES.*

*In JAN 2023 she posted to HOCU as an instructor and SMO of the unit. She has commenced a Masters of Reproductive Medicine and continues to do placement at a Women's Health Clinic between courses.*

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### Would I Trust a Contractor with My Soldiers, Sailors, and Aviators? A Potential Paradigm Shift

Dr Cat Davison<sup>1</sup>, [Dr Jon Kendrew](#)<sup>1</sup>

<sup>1</sup> *Iqarus*

*Military medical services around the world are having to 'do more with less' as their commitments increase, global footprints expand, and budgets shift.*

*All whilst needing to offer high quality clinical care, governance and oversight to 'buy out' that risk of those high impact but low likelihood events for everyone.*

*Contracted medical services in traditional military spaces, reserved for military medical capability only, is on the rise.*

*This short presentation will explore the concept, the reality, and test some pre-conceived assumptions many have, including the author when she jumped across. 'Game Keeper turn Poacher.'*

#### Biography:

*Wg Cdr (retired) Cat Davison joined Iqarus as a Regional Medical Director in summer 2022, now designing, running and growing medical facilities in Afghanistan, Asia and Europe. Joining after a 21-year career in the Royal Air Force (RAF). Early career as a GP with broad experience in leading teams, medical planning and delivering medical care in remote and austere environments. She undertook two stints in the UK Military Operational HQ as a medical planner. Commanded and led Tactical Medical Wing, a 160 + strong unit sending medical capabilities worldwide, some at 12 hours' notice. She deployed as the Deputy Force Medical Officer in the United Nations Mission in South Sudan (UNMISS), then worked in policy in the UK Ministry of Defence HQ before finishing her military career as the Personal Staff Officer to the Deputy Commander (3\*) of the RAF. Cat invests and works with medical start-ups, has a property company, and ran Marathon Des Sables (never again)!*

*Dr Jonathan Kendrew*

*Prior to joining Iqarus as a Regional Medical Director, Jon was a consultant trauma surgeon and the UK Defence Consultant Advisor for Trauma and Orthopaedic surgery. A key clinician in the acute care pathway of the unprecedented number of casualties returning to the UK from Afghanistan, he quickly gained extensive operative experience in all echelons of military surgical care. From emergency war surgery on deployed operations at Camp Bastion Hospital to the acute life and limb saving surgery and subsequent delayed reconstruction of blast and gunshot injuries at the Queen Elizabeth Hospital Birmingham, he saw first-hand how the severity of injuries increased as the conflict became characterised by the use of ever more powerful IEDs. He has published papers on these war injuries, has presented his work both nationally and overseas, and has co-authored Orthopaedic chapters in several key textbooks. He has been an invited guest speaker at both the British and German Orthopaedic Society's, the British Trauma Society, the Orthopaedic Trauma Society and the Internationally renowned Edinburgh Trauma Symposium. Kendrew is an Honorary Research Fellow at the Royal British Legion Centre for Blast Injury Studies at Imperial College London and sits on the CBIS Amputee Studies Advisory Board*

### Acceptability of a Mindfulness App and Smartwatch Amongst U.S. Veterans with PTSD

Dr Lorcan O'byrne<sup>1</sup>, Professor Rumi Kato Price<sup>2</sup>

<sup>1</sup> University College Dublin

<sup>2</sup> Washington University

#### Aim

Several barriers (stigma, financial concerns, geographic constraints and medication concerns) discourage U.S. Veterans from seeking effective posttraumatic stress disorder (PTSD) treatment. Thus, despite the availability of evidence-based treatments, rates of PTSD remain high in this population, highlighting a need for innovative management tools. Previous studies have shown mobile applications to be efficacious in treating PTSD symptoms. Mindset is a similar application, designed to help users manage their mental health symptoms; however, it is novel as it utilizes heart rate-related data via a smartwatch to monitor user's stress level and deploy app e-therapies.

#### Method

This pilot study evaluates the effectiveness and acceptability of Mindset and the applications capacity in managing PTSD symptoms. Twenty-four community-residing Veterans meeting inclusion criteria completed both baseline and follow-up interviews. Following baseline interview, participants used the Mindset app and related heart rate watch continuously for approximately one month until their follow-up interview. Interview assessments included pre- and post-deployment experiences, standardized screeners for PTSD (PCL-M), anxiety (GAD-7), depression (PHQ-9), alcohol use problems (AUDIT-10), and user experience with Mindset, among others.

#### Results

A significant decrease ( $p < 0.05$ ) was found in PCL-M, PHQ-9 and AUDIT-10 between baseline and follow-up interviews. Respondents reported moderate to high acceptance and satisfaction with Mindset features. Mindset use may be associated with decreasing symptoms of PTSD and alcohol abuse in this sample of U.S. Veterans.

#### Conclusion

This study highlights a Mindfulness app, such as Mindset, as a useful tool to augment existing therapies for PTSD in war veterans.

#### Biography:

Lorcan is a junior doctor from Ireland, currently working as a Resident Medical Officer in Perth, Australia. This research was completed while on Scholarship at the Department of Psychiatry at Washington University in St Louis, United States

### ADF Military Medicine: Starting With 'Who'

Dr Neil Westphalen<sup>1</sup>

<sup>1</sup> Royal Australian Navy

When we think about the health services we provide, we generally start with:

- What we do...
- and how we do it...
- ... but not so much about why, beyond phrases like 'saving lives' or 'improving people's health', usually as ends unto themselves.

This approach comes naturally, because it starts with something concrete, and progresses to things that are more abstract.

This presentation offers some thoughts as to how we currently think about what the ADF health services do, based on a derivation of Simon Sinek's 'Golden Circle', and ask if it needs to change.

#### Biography:

Dr Neil Westphalen graduated from the University of Adelaide in 1985, joined the permanent Royal Australian Navy in 1987 and transferred to the Reserve in 2016. During this time, he accumulated 2 1/2 years afloat in the Red Sea, southeast Asia, southwest Pacific, and southern Indian Ocean, while undertaking multiple clinical and staff roles ashore in NSW, VIC and WA. His postgrad qualifications include a MPH, a DipAvMed, and Fellowships of the RACGP, ACAsM and AFOEM. He was accepted as a history PhD candidate at UNSW Canberra in March 2020; his topic "Medical Support for RAN Operations 1901-1976".



### ClearDrum: the World's First Prosthetic Device for the Repair of Tympanic Membrane

Dr Filippo Valente<sup>1</sup>, Professor Marcus Atlas,  
Mr Philip Canner

<sup>1</sup> ClearDrum Pty Ltd

<sup>2</sup> Ear Science Institute Australia

Blast-related ear injuries are a concern during deployment because they can compromise a service member's situational awareness and adversely affect operational readiness. Tympanic membrane ruptures are among the most common ear injuries diagnosed.

ClearDrum® is the world's first customized treatment solution for sufferers of tympanic membrane perforation, which is also caused by chronic diseases of the middle ear and represents a major cause of disability for children and adults globally. Current treatments are unsuitable resulting in revision surgery, hearing loss and ongoing disability. The ClearDrum® device, provides an off-the-shelf, fit-for-purpose implant to resolve these difficulties in a single, straightforward surgical procedure. The project has run for 10 years, to develop a novel product based on a silk fibroin biomaterial. The project has now completed the preclinical phase of development, which include a working prototype, a strong international IP position, a US contracted manufacturer, an established supply chain, collaborations with a series of specialist Australian companies, international surgeons and consultants and a dedicated company to for its commercialisation

#### Biography:

*Dr Filippo Valente is a biomedical scientist with a background in biomaterials research and commercialization. This includes the development of nanomaterials for drug delivery and polymer scaffold for ENT surgical implantation. Dr Valente led the product development of the ClearDrum® medical device for tympanic membrane repair at Ear Science Institute, and created a dedicated company to commercialise this innovation, ClearDrum Pty Ltd.*

### Comparison of the Scope of Practice of ADF Non Commissioned Health Care Providers Versus Civilian Australian Paramedics

Dr Felix Ho<sup>1,2,3,4,5</sup>, Mr Alexander Johnston<sup>2,6,7</sup>

<sup>1</sup> Department of Health

<sup>2</sup> St John Ambulance Australia

<sup>3</sup> Flinders University

<sup>4</sup> Charles Darwin University

<sup>5</sup> Royal Australian Air Force

<sup>6</sup> Royal Australian Navy

<sup>7</sup> University of Tasmania

Australian Defence Force (ADF) medical technicians (medics) and sub-medical health providers (eg. patrol medics, combat first aiders, ship's medical emergency team members) operate as non commissioned health care providers within all three services as frontline health care providers on operations in austere environments, for garrison health support and on civilian placements. Medics have been trained for registration as an Endorsed Enrolled Nurse through a Diploma of Nursing, and previously in pre-hospital care with a Diploma of Paramedical Science (now obsolete); while other providers have in-house endorsement.

Many aspects of their roles are similar to of civilian Australian paramedics especially during airfield or garrison support, or on operations. However, the scope of prehospital health care providers and scope varies between services and locations.

This poster aims to review the current scope of practices of ADF non commissioned officer health care providers and compare these against that of civilian paramedic scope of practices.

#### Biography:

*AB Johnston recently transitioned out of the RAN in August 2020 after joining in January 2015. He has been deployed on OP Manitou, Resolute and Augury on multiple naval platforms. He holds a Bachelor of Paramedic Practice and currently completing a Masters of Advanced Paramedicine. He is employed as an on road paramedic in Darwin.*

*Felix Ho is a medical practitioner and paramedic in Darwin and a RAAF Reservist. He holds appointments as a lecturer with Flinders University and adjunct appointment with Charles Darwin University*

### Complementary and Integrative Medicine Prevalence and Utilisation in International Military and Veteran Settings and Communities: A Systematic Review

Dr Jessica Bayes<sup>1</sup>, Mr John Palencia<sup>1</sup>, Prof Jon Wardle<sup>1</sup>

*1 Southern Cross University*

**Background:** Active-duty military personnel and veterans have unique and complex health needs, with the high demands of military life often leading to chronic physical and mental health conditions. Complementary and integrative medicine (CIM) could be a possible solution to this problem. Some military health systems (MHS), have started integrating CIM into health care delivery. However, there has been no systematic evaluation of the prevalence and utilisation of CIM in military and veteran populations globally.

**Methods:** A systematic literature review of original research which assessed the prevalence and utilisation of CIM among active serving military or veterans was conducted. CINAHL, Medline, Scopus and AMED databases were searched up to the 3rd of February 2023.

**Results:** A total of 27 studies met the inclusion criteria and were included in this review. The overall quality of evidence was high with a low risk of bias. Utilisation of CIM therapies varied. The lowest utilisation demonstrated that only 1.9% of services delivered by MHS were CIM. The majority of studies found utilisation rates between 30-80%, with some studies reporting use as high as 90%. The most commonly used therapies included chiropractic care, massage, mindfulness/meditation and acupuncture. Utilisation of CIM products was high and ranged from 32% to 87%. The most frequently used products were dietary supplements, particularly multivitamins and minerals and protein supplements/amino acids. Use of herbal medicines was high among veterans ranging from 10% to 79%.

**Conclusion:** The high demand for CIM treatments by military personnel and veterans has important implications for policy, funding allocation, and integration of these services into clinical practise, particularly by countries not currently doing so. Further research is needed assessing the implementation of CIM therapies into real-world settings to explore barriers and facilitators for their use in clinical practise, and by extension, their integration into the wider healthcare system.

### Biography:

*Dr Bayes is a postdoctoral research fellow at Southern Cross University. Her background is in nutrition, dietetics and integrative medicine. Her research focus is in the field of nutritional psychiatry which explores the role of nutrients, foods and dietary pattern in mental health conditions.*

### FORTRES: Prospects and Opportunities of a Dedicated Therapeutic Milieu for Veterans

Dr Marie Boulianne<sup>1</sup>, Dr Richard Magtengaard, Mrs Cathy Thomas, Dr Richard Bostwick, Dr Michael Leocadio

*1 Bethesda Clinic*

*2 Australian College of Mental Health Nurses*

Veterans have higher rates of both mental and physical health problems than the general population (Gibbs et al., 2020). They experience a host of psychiatric conditions including PTSD, anxiety, depression chronic pain, substance misuse and other comorbidities (Terhaag et al., (2022) at a rate of up to 40% (Trivedi et al., 2015). Stigma around mental health reportedly prevents up to 60% of them in accessing assistance (Sharp et al., 2015). To our knowledge, no mental health facility in Australia has a specifically dedicated veterans' ward. Veterans' mental health for in-hospital care have traditionally been delivered within mixed cohort wards with civilians. Therapy sessions and overall care are delivered from a generalist perspective to suit the majority. Because of the nonspecific care delivery other issues facing these veterans including loss, role and relationship adjustments, alienation, fighting and withdrawal, and the intricacies around trust are ineffectively addressed.

Bethesda Clinic was established in response to a growing demand from consumers for mental health care services that meet individualised needs. After feasibility studies and consumer engagement, a 75-bed mental health facility was constructed in Western Australia to serve the region and beyond. Of these, 25 beds were specifically dedicated to Veterans and First Responders. A group of health professionals, information, technology, and engineering specialists collaborated designed a holistic, trauma-informed, and recovery-focused service. Characteristics of the model included: central triage, inpatient therapy programme, Wellness and Recovery Centre and discharge planning by a dedicated GP Liaison/ Discharge Coordinator. Doctors and consumers have

access to portals outside of the clinic. The ward uses the FORTRES framework to provide personalised care to veterans and first responders.

**Fellowship** – Fellowship is an important factor in veterans' mental health as it improves their social connection, self-esteem, confidence, and coping skills. The power of socialising with other veterans, particularly evident in group therapy, ward activities, mealtimes, and exercise groups enhance the therapeutic outcomes.

**Open Access** – Provision of psychoeducation, resources, and opportunities to address veterans' individualised needs, including allied health team, enhance psychosocial interventions to address housing, education, pastoral/spiritual needs, and substance misuse. Knowledge articles and worksheets are accessible for veterans to strengthen their skills and enriched by nurses on the ward.

**Recovery-focused** – Discharge planning starts from admission with the formulation of crisis management, transition-to-home care, and safety plan. This involves establishing hope, optimism, strengths, and abilities for a meaningful and purposeful existence. Progress is monitored throughout the admission, quantified through a technology known as Mentegram and through a follow-up post discharge.

**Trauma-informed care** – Staff education includes close collaboration with specialised organisations providing additional military depth and context. To prevent re-traumatisation, the clinic features Safewards as its care model, sensory-modulated therapeutic environment, and trauma-trained and therapeutic clinical staff.

**Empowerment** - various encounters (e.g., group therapy, one-on-one sessions, specialised allied health provider) centre on empowerment, mood, anxiety, mindfulness, values, resilience, shame, guilt, and grief processing groups, and healthy ageing. Family meetings are encouraged and extend the care to veterans' meaningful others. Community meetings are held every week for each veteran to find their voice and provide feedback to help shape their experience and continue to improve the quality of the service.

**Synergy** - Individualised goal setting and care planning based on four therapeutic quadrants (i.e., physical, psychological, social, spiritual) are created and implemented with the veteran. Transdisciplinary involvement of external providers (pain specialists, advocates, AOD specialists) to combine their expertise in addressing multiple and complex issues.

Future directions for the clinic include the development of a Trauma Recovery Day Program,

a hospital-at-home program, and the impact assessment of the FORTRES framework in shaping and advancing the mental healthcare of veterans.

### Biography:

*Marie works at Bethesda Clinic as the Clinical Nurse Manager providing specialised mental health care to Veterans and First Responders. Her working experience includes a mixture of community mental health nursing, private practice, and academic positions in undergraduate and postgraduate nursing.*

*She is a Credentialed Mental Health Nurse with the Australian College of Mental Health Nurses where she also holds the position of Chair for the Western Australian Branch.*

Marie completed her PhD at the University of Notre Dame researching the role played by humour in the development of resilience and wellbeing in nursing

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## How to Deploy a Molecular Diagnostic Laboratory at 72 hours' Notice to Move

LTCOL Timothy Inglis<sup>1,2,3</sup>, Mr Teagan Paton<sup>1,2</sup>, LTCOL Joanne Briggs<sup>4</sup>

<sup>1</sup> University of Western Australia

<sup>2</sup> Health Department of Western Australia

<sup>3</sup> RAAMC

<sup>4</sup> RAANC

### Background

Following notification of a suspected quarantine breach in 2020 affecting potential Defence personnel in the north of Western Australia, a decision was made to deploy a mobile laboratory team out of Perth. No proprietary point of care SARS-CoV-2 molecular tests methods had been validated for regional use in WA by that stage. However, a compact molecular diagnostic SARS-CoV-2 test capability had been developed by the state pathology service as an emergency contingency through resource industry and philanthropic funding.

### Method

The air portable COVID laboratory was deployed with three staff in a one day, fly-in/fly-out operation to Broome and back to Perth. A forward sample collection point was established by arrangement with local administration. COVID-19 swabs were transferred under continuous cold chain to the nearest regional pathology laboratory where the portable molecular laboratory was set up in optimal

conditions. All PCR assays and control serials were completed before packing up and departing in time for the evening return flight. On arrival back in Perth, samples were offloaded at the reference laboratory, and run using reference methods the following day.

### Results

72hr notice to move proved challenging, with a 48hr laboratory payload preparation window including reagent and equipment checks, packing and delivery to civilian aviation services. The most difficult component was the 100mL volume of analytical grade ethanol required for specimen extraction, which required a special permit for carriage by air. Once in location, an offline label printer with data input avoided double entry of specimen identification details. Use of a civilian laboratory aided specimen processing workflow but was not essential. The PCR assay controls all performed as expected. 19 patient specimens were all SARS-CoV-2 negative in field and by reference assay. The cold chain was maintained throughout transit. As no positives were detected, the personnel were able to continue their training programme with minimal interruption, and follow up PCR assays later.

### Conclusion

The distances between specialist molecular diagnostic services and regional centres posed significant logistic problems for a civilian response to suspected COVID incidents in the early stages of the pandemic. Deployment of a rapid response team to regional WA delivered accurate results to WA public health and unit command, enabling timely decisions on further action. Rate limiting deployable laboratory components such as absolute ethanol could be pre-deployed in future. The flexible open format used on this occasion has wider application, including a variety of Defence field applications. Close to point of care molecular diagnostic methods were subsequently deployed to most WA regional laboratories to accelerate generation of actionable COVID results.

Reference. Paton TF, Marr I, O'Keefe Z, Inglis TJJ. Development, deployment and in-field demonstration of mobile coronavirus SARS-CoV-2 Nucleic acid amplification test. J Med Microbiol. 2021 Apr;70(4):001346.

### Biography:

*Dr Inglis works with the WA Country Health Service, PathWest and the University of Western Australia on the Country Health Infection programme (CHIP). During the COVID-19 pandemic he and colleagues developed a fully deployable SARS-CoV-2 laboratory*

*for use in regional and remote locations. He was SMO with the WA joint task group throughout the pandemic.*

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## Introduction of Virtual Care Options to Support Access to Mental Health Services for Defence Members

Dr Veronica Pitt<sup>1</sup>, Dr Amber Willink<sup>1</sup>,  
Lieutenant Colonel Dale Hopcraft<sup>2</sup>, Mr Jericho  
Banaticla<sup>2</sup>

*1 Bupa ADF Health Services*

*2 Joint Health Command*

### Background

Timely access to community-based psychologists and psychiatrists is challenged by a national shortage of health professionals and increased demand in the civilian population. The maldistribution of mental health professionals across Australia means access to care is particularly difficult in regional, rural and remote locations. In the last 18 months, Bupa and JHC have implemented the National Telepsychiatry and Telepsychology services to increase options for ADF members to access mental health professionals.

### Approach

The National Telepsychiatry Service was implemented in September 2021 and the National Telepsychology Service was initially implemented as a soft launch in NSW in October 2022 followed by national implementation in February 2023. To assess the impact of introducing these services, a pre-post study design was used to evaluate access to mental health services during a baseline period 12 months pre-implementation compared to the current 12-month period to account for seasonal fluctuations in utilisation. Primary outcome was the average wait time for initial referral requests. Secondary outcome measures for access included travel distance and incidence of failure to attend a booked appointment. The impact on members was evaluated based on patient experience scores for off-base psychiatry and psychology encounters.

### Findings

Since implementation in September 2021, 589 initial referrals have been raised for the National Telepsychiatry Service equating to 5% of the total volume of initial psychiatry referrals in the period ending 30 April 2023. Comparison of pre and post implementation periods showed a reduced average appointment wait time for psychiatry services by 1 day.



Since the soft launch of the National Telepsychology Service in October 2022, there have been 190 referrals for the service. This is 3% of the total volume of initial psychology referrals raised in the period up to 30 April 2023. Comparison of pre and post implementation periods shows a 5 day reduction to average appointment wait time for psychology services.

There was little change in secondary measures for access (travel distance, failure to attend) for both services. Patient experience scores improved for mental health encounters.

### Discussion

Video-enabled consultations allow members to gain access to a national network of mental health professionals and overcome local challenges in accessing providers or experiencing long wait times. In the context of national shortages of mental health professionals and increased wait times for civilians accessing services, the improvements in timely access to care for Defence members during this period is a meaningful difference. We note several challenges and enablers for implementation and uptake of national virtual mental health services. Challenges included the need for behaviour change in referral practices, differences between service delivery models for civilian and Defence populations (particularly psychiatric services), local application of decision support tools for referring to virtual services, and perceptions of telehealth as a mode for delivery.

Enablers for the uptake of virtual care services include provider engagement with on-base health professionals to align service delivery to meet Defence needs, supporting multiple communication channels to enable on-base health professionals to raise informed referral requests for external providers, and identifying a discrete population of high-volume referrers to champion local implementation of new services.

### Conclusion

Introduction of telehealth increases the options available to members to access care in a timely and convenient manner. There are further opportunities to explore telehealth options to improve access to care for members more broadly within the Defence Health System.

### Biography:

*Veronica Pitt is the Change and Transformation Partner for Bupa ADF Health Services where she leads a portfolio of improvement and innovation initiatives in partnership with Defence and stakeholders. She is*

*experienced in evidence-based clinical practice and policy with a PhD in Science and Master of Business Administration from The University of Melbourne.*

*Dr Amber Willink is the Head of Service Delivery Optimisation at Bupa ADF where she works in partnership with Defence to identify and implement service delivery improvements. Prior to joining Bupa, Amber was an Associate Professor at the University of Sydney and Johns Hopkins University. She has a PhD in Health Services Research and Policy from Johns Hopkins University.*

*Lieutenant Colonel Dale Hopcraft is a psychologist posted to Joint Health Command as the SO1 Mental Health in Garrison Health and has served in the Australian Army for over 22 years. In this time he has undertaken a range of clinical, organisational, instructional and operational and staff appointments, which has included postings to the Mental Health and Psychology Section – Kapooka, the 1st Intelligence Battalion, the 1st Psychology Unit and the Army School of Health, and he has deployed on Operations ASTUTE, VIC FIRES ASSIST, HANNAH, ACCORDION and OKRA.*

*Mr Jericho Banaticla is currently serving as the Deputy Director of Continuous Improvement and Innovation at Joint Health Command. He is an experienced Continuous Improvement Manager with qualifications in business management (MBA), process engineering and agile project management. He has led LEAN continuous improvement projects in the automotive and health care industries.*

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## Measuring Moral Injury in an inpatient psychiatric unit for Military and Service Related Trauma

Professor Zachary Steel<sup>1</sup>

*1 School of Psychiatry, University New South Wales*

Fear based models of PTSD have dominated research and clinical approaches to PTSD since the 1990s. Trauma-focused treatment approaches have emphasised interventions that facilitate habituation and fear extinction or the use of cognitive strategies to reduce exaggerated threat appraisal. There is growing recognition that these models and approaches do not address the full range of emotional injuries that can generate a traumatic stress response. Existing models of PTSD recognise that trauma exposure will often lead to a range of negative emotional appraisals. In particular threat appraisal associated with life threat and fear will often also be associated with feelings of , horror, shock, anger, guilt and shame responses.

In response to the growing recognition that military and first responder groups commonly experience traumatic loss and moral injury we introduced a standard assessment of feelings of moral injury as part of a multi-modal assessment package.

St John of God Richmond Hospital has a long history of providing care for Veterans and first responders presenting with psychological injury. The Xavier Ward is 30 bed inpatient unit for service-related PTSD. In 2020 we introduced a multimodal assessment that included the

Moral Injury Events Scale (MIES) that consists of 9 items measuring perceived transgressions by self and others and perceived betrayal by others. We present the findings of the MIES in this population and the relationship of MIES to Results are presented for 100 consecutive admissions with the majority of patients. The majority of patients identified with encountering high rates of exposure to moral injury most often at the hands of others but also to a significant due to perceived transgressions of their own. These experiences were strongly intercorrelated with other symptoms of PTSD, anger and anxiety.

### Biography:

*Trauma and Mental Health, a partnership between Richmond and Burwood Hospital in NSW and the School of Clinical Medicine UNSW. He has a 30 year history of work with populations affected by trauma, including veterans, emergency service workers, refugees, asylum seekers and those affected by mass conflict. He is the immediate past president of the Australasian Society for Traumatic Stress Studies (2019-2021) and Board member for the Service for the Treatment and Rehabilitation of Torture and Trauma Survivors (STARTTS) in NSW.*

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## Prolonged Field Care Guidelines for the Management of Military Casualties Requiring Extended Duration Limb Tourniquet Application

Dr Patrick Weinrauch<sup>1</sup>

<sup>1</sup> 2nd Health Battalion

Tourniquet application is a universally accepted lifesaving emergency intervention for the pre-hospital management of catastrophic limb haemorrhage. Application of arterial tourniquets for short durations of time is consistently safe in relation to local tissue ischaemia, limb salvage rates and the systemic metabolic impacts upon reperfusion.

Delivery of future ready medical care within the Australian Defence Force needs to consider operational environments where casualty evacuation is delayed for multiple reasons including contested evacuation asset manoeuvre, extended evacuation distances, resource limitations and tactical constraints. Prolonged Field Care (PFC) of a casualty with a limb tourniquet applied over an extended time duration for the management of life threatening catastrophic haemorrhage creates unique clinical management issues that impact upon all levels of health care delivery. Tourniquet time correlates with ischaemic limb injury and is therefore associated not only with decreasing rates of limb viability and functional recovery but also with increasing systemic and metabolic impacts upon tourniquet release and subsequent reperfusion. Extended duration tourniquet application therefore represents a concern across all levels of health care provision as it impacts upon pre-hospital and initial emergency care, decisions relating to surgical and anaesthesia management and post-surgical care including intensive care and pharmaceutical protocols.

This paper delivers clinical management recommendations for PFC health care providers in the management of casualties where extended duration limb tourniquet application is necessary. The guidance statements have been developed by comprehensive literature review including collateral information drawn from multiple models that demonstrate pathophysiologic and clinical similarities in respect of limb ischemia, reperfusion injury and systemic metabolic consequence. Guidance statements are provided with Class of Recommendation Strength (COR) and Level of Evidence (LOE) stratification according to the American College of Cardiology (ACC)/ American Heart Association (AHA) clinical guidance recommendation system.

Recommendations discussed within this presentation are as follows:

1. Tourniquet application, reassessment, replacement and conversion techniques are to be conducted in accordance with TCCC guidelines (Recommendation Strength: 1; Level of Evidence: B-NR)
2. Tourniquet application less than 2 hours duration is considered optimal clinical management (Recommendation Strength: 1; Level of Evidence: B-NR).
3. Tourniquet application greater than 2 hours duration is associated with increased risk of permanent ischaemic injury (Recommendation Strength: 2A; Level of Evidence: C-LD).

4. Ischaemia starts at time of wounding and continues until successful revascularisation is achieved (Recommendation Strength: 1; Level of Evidence: C-EO).
5. Limb cryotherapy is protective of ischaemic injury (Recommendation Strength: 2B; Level of Evidence: B-NR).
6. PFC Tourniquet re-evaluation should be conducted if application time greater than 2 hours is anticipated (Recommendation Strength: 2A; Level of Evidence: C-LD).

This presentation is part one of a two part series. The accompanying second part presents recommended surgical facility guidelines for management of casualties after extended duration tourniquet application.

### Biography:

*Orthopaedic Surgeon*

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## Supporting the Holistic Well-Being of Military Personnel: A Research Review and Results of a National Chaplaincy Survey

Rev. Mark Layson<sup>1</sup>, Assoc. Prof. Lindsay Carey<sup>2,3,4</sup>, Dr Megan Best<sup>3,5</sup>

<sup>1</sup> Charles Sturt University

<sup>2</sup> School of Psychology and Public Health

<sup>3</sup> Institute of Ethics and Society, University of Notre Dame

<sup>4</sup> Directorate of Spiritual Health and Wellbeing

<sup>5</sup> School of Medicine

### Background

The Royal Commission on Defence and Veteran Suicide has brought increased attention to the mental health and wellbeing of military personnel in the Australian context. Chaplains have historically been on the frontline of support for military personnel, having been deployed to every military campaign in the history of the ADF. Additionally, a research pilot, approved by the Australian Government, has recently commenced where chaplains will provide support to defence veterans following their discharge.

In accordance with the World Health Organization ICD-11-AM Spiritual Interventions, Chaplains provide assessments, support, counselling, guidance, education and various celebratory or memorial rituals for all defence members and their families — regardless of their faith or no-faith position. Chaplains are also trained with respect

to Moral Injury (MI), Pastoral Narrative Disclosure (PND), to provide psychological first aid, and suicide support in proactive and reactive ways.

However, with increasing secularity in Australia, there has been a call to reconsider the value and role of chaplains. It has been claimed that the faith-based nature of chaplains provides too large a barrier for nonreligious personnel to access chaplaincy support. Some extreme secularists have even recommended the complete removal of faith-based chaplaincy from the ADF.

### Objective

This research project aimed to understand the barriers and facilitators, if any, to ADF chaplaincy services and secondly to explore the usage and satisfaction with chaplaincy services that are currently provided to assist the mental health and wellbeing of ADF members.

### Methods

The first phase of the research involved an international literature-scoping review of the evidence base related to chaplaincy usage and access. Secondly, serving members of Army, Navy, and Air Force were invited to participate in a survey during 2021, to report on experiences around access, usage, and satisfaction of personnel with chaplaincy services.

### Results

The literature review reported on 33 articles involving a total of 19,366 participants from around the world. The hypothesised barrier to accessing faith-based chaplaincy was largely not supported. Instead, other issues were noted by military personnel, including the poor integration of chaplaincy within medical and mental health services. Several enablers for chaplaincy access were reported in the literature along with the positive impact of chaplaincy services on staff wellbeing. Additionally, it was reported that because of high levels of trust in the current faith-based chaplaincy services, chaplains provided an important avenue into other health interventions provided by the military. Finally, results from a 2021 survey, involving 2,783 randomly recruited military personnel, reported high levels of satisfaction from those who had accessed chaplains. Chaplains were also the most preferred staff support service for combined tri-services. Additionally, over 67% agreed that chaplaincy was important or very important, while over 82% of chaplaincy users reported that the faith of the chaplain was not an important factor in their accessing support.

### Conclusion

Chaplains are well-placed, and highly utilised wellbeing professionals who have, for over a century, been trusted by many personnel to be an integral element of the holistic health and wellbeing services for military personnel. Suggestions on chaplaincy improvements and various methods for the better integration of chaplaincy with mental health care professionals are discussed.

### Biography:

*Rev. Dr Layson's doctoral research developed a biopsychosocial-spiritual framework to prevent moral suffering in first responders. Mark Layson recently submitted doctoral research that developed a biopsychosocial-spiritual framework to prevent moral suffering in first responders. He has served 11 years as an ambulance chaplain to critical care paramedics and doctors. His lived experience of trauma work as a police-officer and firefighter, along with research interests in moral philosophy and moral psychology inform current research. His doctoral research explored the intersection of workplace safety, staff wellbeing, morality, and spirituality.*

*Dr Carey commenced tertiary teaching and research in 1989 with the Lincoln Institute of Health Sciences and then with La Trobe University in 1991. He has served as Research Fellow for the Caring for Caregivers Program, Research Fellow with the Royal Australian College of General Practitioners Evaluation Program, Chaplaincy Research Fellow at the Northern General Teaching Hospital Sheffield and the National Research Fellow with the Australian Health & Welfare Chaplains Association. He is the author of over 200 publications and is Editor-In-Chief of the international journal 'Health and Social Care Chaplaincy', and Editor-In-Chief of the 'Journal of Religion and Health'. He has twice been recognised as a National Field Research Leader and was co-awarded the 'Sir Edward Weary Dunlop Award' for research in veteran health.*

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## The Evacuation of Australian Visa Holders from Kabul: A Reflection on the Challenges and Lessons Learned

Mr Matt Ingram<sup>1</sup>

<sup>1</sup> Aspen Medical

In August of 2021, Aspen Medical through its office in the United Arab Emirates was contacted by the Australian Government's Department of Foreign Affairs and Trade (DFAT) in request of medical

support for the imminent arrival of Afghan evacuees. As part of this request, Aspen Medical was asked to deploy a medical capability through its UAE office with immediate effect. In response, and within 72 hours of receiving the request, Aspen Medical established a deployable clinic with observation rooms, consultation rooms, a resuscitation capability, pharmacy, temporary short stay admission, ambulance capability, and the provision of medical equipment and consumables. Whilst initial estimates indicated that 200-400 evacuees would arrive in country, within 14 days 2,800 evacuees had arrived and under the care of Aspen Medical. The evacuees would transit the United Arab Emirates (UAE) on route to their final destinations of Australia, New Zealand and the United States.

The operation would present numerous challenges to the joint repatriation effort. The importation and customs clearance of a deployable clinic constituted the first obstacle, requiring high-level intergovernmental engagement and coordination. The rapid nature of the evacuation meant that advanced warning of sick and injured evacuees was constrained. This extended to the provision of detailed manifests which was similarly encumbered by the complex conditions on the ground in Kabul. Planning and forward projection in such circumstances remained a key challenge.

Government and non-government medical officers were faced with daily decisions where patient fitness to travel needed to be carefully balanced with an imperative to quickly repatriate. As part of this deliberation, our medical officers needed to consider the extant availability of appropriate medical care versus the care available in the home country. Sub-optimal, high density living conditions and the risk of COVID-19 transmission further confounded the complexity of decision-making.

During peak evacuee numbers, identifying the presence of sick and injured evacuees remained difficult. For example, the identification of late term pregnancies and strokes were on occasion reported to have been discovered by chance, often when clinicians would transit between clinic locations. This challenge was due in part to a perceived fear that illness or injury could prevent repatriation, or risk being returned to Kabul.

Whilst many of the challenges were reasonably foreseeable, some were not. The arrival of minors without parents or guardians represented some of the social challenges experienced throughout this operation. The ability to care for children whilst parents underwent treatment or medical review required additional resourcing. Importantly, the value of non-clinical care and services proved to be a



significant factor in establishing trust and confidence in the clinical services.

During the peak 19-day period, Aspen Medical treated 715 patients, 15% of whom were 5 years of age or younger

### Biography:

*Sean Ryan started his career as an officer in the Australian Defence Force (ADF) serving as a military planner in Bosnia-Herzegovina and Afghanistan, as well throughout Australia and the Indo-Pacific for various national disasters and crisis responses. Since retiring from the military, Sean has also filled various project and program management positions across Aspen Medical including numerous COVID-19 health responses and Pacific health initiatives.*

*He has considerable experience in strategic planning, corporate management, inter-agency coordination, multi-national stakeholder engagement, organisational training, and program management. By combining these skills, Sean has developed experience in coordinating and planning to deliver innovative models of care that promote access to health care in austere environments for Governments and private sector companies.*

*Sean currently holds the position Chief of Staff for Aspen Medical Group.*

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## True Grit: Wearable Warning for the Weary Warrior

LTCOL Timothy Inglis<sup>1,2,3,4</sup>, Mr Benjamin McFadden<sup>1</sup>

<sup>1</sup> University of Western Australia

<sup>2</sup> PathWest Laboratory Medicine WA

<sup>3</sup> WA Country Health Service

<sup>4</sup> RAAMC

### Introduction

Declining use of rapid antigen tests (RAT), closure of drive-through PCR clinics and a declaration of the COVID-19 pandemic's end generated confusion about whether, when and how to test for SARS-CoV-2 infection. The impact on strenuous exercise and return to pre-infection workload remains uncertain, and is complicated by a lack of agreed triggers and warnings.

### Case report

Notification of a potential family COVID-19 contact came immediately after completion of a civilian cross country run and assault course (True Grit, WA). A

positive RAT confirmed infection and resulted in mandatory leave from work. RATs were repeated daily until negative, then a point of care nucleic acid amplification test (TestIT, Lucira) was run, demonstrating persistent detectable SARS-CoV-2 signal. Smart watch physiological data from the RAT-positive period and the preceding month showed a fall of heart rate variability (HRV) into the abnormally low zone which persisted into the RAT-positive period. Discussion with endurance sport associates identified others with a similar HRV pattern during SARS-CoV-2 infection. The index case completed the True Grit course as a solo participant unaided apart from the rope climb and high vertical obstacles that required lower limb strength.

### Discussion

The HRV fall during acute infection is consistent with loss of autonomic regulatory function. Rest and gradual return to normal exercise load resulted in successful resumption of endurance running over the following two months.

### Conclusions

Smart watch trend data can provide early warning of the effects of subclinical COVID-19 and could be used as a trigger for diagnostic tests in otherwise healthy personnel. Wearable technology is likely to gain wider use in diagnostic and occupational safety applications.

### Biography:

*Dr Inglis was SMO to the WA joint task group throughout the COVID-19 pandemic, when he took up endurance running for physical and mental health maintenance. He has an interest in machine learning applications in health and supervises research in the field, including the early diagnosis and monitoring of COVID and other infections.*

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## Virtual Health Opportunities in Australia: Opportunity and Risk

Ms Laura Malceski<sup>1</sup>

<sup>1</sup> Aspen Medical

Virtual health has emerged as a transformative force in Australian healthcare and the medical landscape has undergone significant changes thanks to the emergence of virtual health opportunities.

Technologies such as telemedicine, remote monitoring, and digital health tools have gained prominence, offering numerous benefits and posing certain challenges.

### **Advantages of Virtual Health in Australia**

**Enhanced Healthcare Accessibility:** The Australian Digital Inclusion Index for 2023 reported digital inclusion at the national level continues to steadily improve. Recent years have seen an increase in Australia's average Index score from 67.5 (2020), to 71.1 (2021), to 73.2 (2023).

**Improved Convenience:** Data from Australian Digital Health Agency from August 2022 shows between 13 March 2020 and 31 July 2022, 118.2 million telehealth services have been delivered to 18 million patients, and more than 95,000 practitioners have now used telehealth services.

**Cost Savings:** The Australian Healthcare and Hospitals Association reported that telehealth services can result in cost savings of up to \$96 per patient per consultation. The reduction in travel costs for both patients and healthcare providers is a significant contributor to these savings.

**Enhanced Management of Chronic Diseases:** The Commonwealth Fund's 2020 International Health Policy Survey revealed that 43% of Australians with chronic health conditions have availed themselves of telehealth services. Virtual health tools facilitate continuous monitoring and effective management of chronic diseases.

**Increased Access to Specialist Care:** A study published in the Medical Journal of Australia (MJA) found that telemedicine has expanded access to specialist care by an impressive 44% in remote regions. Virtual health services bridge geographical gaps, allowing patients in remote areas to consult with specialists located anywhere in the country.

### **Disadvantages of Virtual Health in Australia**

**Limited Digital Literacy:** The Australian Digital Inclusion Index for 2023 reported major issues in digital ability. Some groups saw declines in Digital Ability scores over the past three years, including people in the lowest income quintile and Australians aged over 75 years old.

**Privacy and Security Concerns:** The Office of the Australian Information Commissioner received 63 data breach notifications in the healthcare sector between January and June 2023. Ensuring the security and privacy of patient data remains a significant challenge in the realm of virtual healthcare.

**Technological Barriers:** The Australian Digital Inclusion Index for 2023 reported that approximately 9.4% of Australians are 'highly excluded' when it comes to internet access. Also 10.5% of Australians are connected via mobile phone only. Limited

connectivity and access to technology can hinder the adoption of virtual healthcare in rural regions.

**Diagnostic Limitations:** Virtual consultations may be less effective for certain medical conditions that necessitate physical examination. In some cases, the accuracy of diagnosis and treatment may be compromised.

**Regulatory and Licensing Challenges:** The Health Practitioner Regulation National Law (National Law) underwent amendments in response to the COVID-19 pandemic to facilitate telehealth services. In 2020, at the start of the COVID-19 lockdowns, the Australian Government introduced whole-of-population access to telehealth under Medicare.

### **Conclusion**

Virtual health opportunities in Australia offer numerous advantages, including improved accessibility, convenience, and cost savings. Nonetheless, it is crucial to address challenges associated with digital literacy, data privacy, and technological infrastructure to ensure equitable access and safeguard patient information. Australian Government entities should continue to support the expansion of virtual healthcare whilst actively working to mitigate associated drawbacks. For further information and tailored recommendations, consultation with relevant healthcare authorities and experts in the field is recommended.

### **Biography:**

*Laura started her career as a Registered Nurse in Pre and Post Operative Care and later progressed to supporting Specialist Practice. During her time at Aspen Medical, Laura has overseen the delivery of Virtual Care services during the COVID-19 Pandemic for Commonwealth and State Territory Governments. Laura later worked across multiple projects with clients including the Australian Defence Force. Laura's current portfolio now includes the clinical and operational oversight of a national triage service, requiring the management of a workforce of over 400 remote clinicians in geographical locations throughout Australia.*

*Laura's academic awards include; Bachelor of Health Science – Nursing, Post Graduate - Leadership and Management in Healthcare (current).*

*Laura currently holds the position of Clinical Operation Manager at Aspen Medical.*

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# AMMA CONFERENCE 2023 AWARD WINNERS



The Weary Dunlop Award, for the best original presentation at the conference was awarded to FLTLT Danielle Polgar, for her presentation titled Returning to aviation-related duties after COVID19. Comparison of old and new aeromedical guidance, and lessons learned for future policy development.



Best New Presenter was awarded to MAJ Melissa Zahra, for her presentation Strengthening Force Health protection through integration and interoperability.



Best Presentation by a Junior Officer went to Catherine Holland, for her presentation titled, Nursing Workforce Shortages: What can the Australian Defence Force learn from the Rural and Remote Nursing workforce experience.



The Best Poster Prize was awarded to Dr Patrick Weinrauch, titled Prolonged Field Care guidelines for management of military casualties requiring extended duration limb tourniquet application.

BEST MILITARY HEALTH PAPER: Charles Pilgrim "Treatment at Point of Injury – Forward movement of surgical assets to address noncompressible truncal haemorrhage."

BEST VETERAN'S HEALTH PAPER: WGCdr Anna Lewis "More Important Than Winning': a Retrospective Online Research Survey Evaluating the Effects of Participating in an Adaptive Sports Program for Wounded, Injured and Ill."

BEST NEW AUTHOR: Virginia Williams "Changes in Stigmatising Beliefs and Help-Seeking Intentions Following a Recreational Peer Based Program for Young People Affected by Military Associated Parental Mental Illness."





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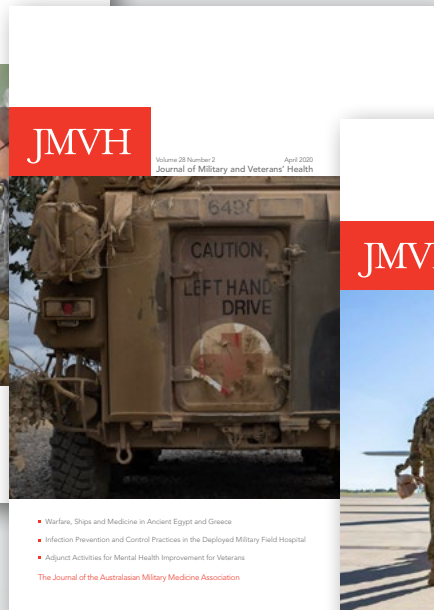
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