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Journal of Military and Veterans' Health

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The Journal of the Australasian Military Medicine Association

Australian Government
Department of Defence
Department of Veterans' Affairs

Defence and Veteran Mental Health and Wellbeing Strategy

The Defence and Veteran Mental Health and Wellbeing Strategy 2025–2030 is a joint initiative between the Department of Veterans' Affairs (DVA) and the Department of Defence (Defence).

The Strategy's vision is to empower and support the Defence and veteran community for optimal mental health and wellbeing during service or employment, during transition to civilian life and beyond.

The Strategy has six goals:

1. Promote and assist wellbeing
2. Improve mental health and wellbeing through prevention and early intervention
3. Facilitate timely access to quality care and support
4. Grow a positive and connected Defence and veteran community
5. Prioritise suicide prevention initiatives
6. Use evidence and data to drive positive outcomes.

The Strategy is underpinned by two action plans, one focused on mental health and wellbeing and the other on suicide prevention.

Defence and DVA gratefully acknowledge all contributions which have informed the development of the Strategy.

Scan the QR code to access the Strategy or visit:
www.dva.gov.au/documents-and-publications/defence-and-veteran-mental-health-and-wellbeing-strategy-and-action-plans

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Cover Photo: Moonrise with OSC – 4HB

Journal of Military and Veterans' Health

Australasian Military Medicine Association

STATEMENT OF OBJECTIVES

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

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

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

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Editorial

The Last Total War

In 2025, we commemorate the 80th anniversary of the Second World War – the last 'total war.' As a country, we are fortunate that we have not seen any further 'total wars' since 1945, but this does not preclude them occurring in the future. 'Total war', as a concept, arose at the end of the First World War.[1] In 1918, Leon Daudet released his book *La Guerre Totale* (The Total War).[2] Daudet describes 'total war' as 'the extension of the struggle, in its acute phases as well as its chronic phases, to the political, economic, commercial, industrial, intellectual, legal, and financial realms'.[3] General Eric Ludendorff further popularised the term in his 1935 polemic, *Der Totale Krieg* (Total War), where he proposed that the distinctions between all elements of society must be removed in war mobilisation and the country should be led by a military dictator.[4] Major General J.F.C. Fuller's commentary on the Italian invasion of Abyssinia in *The First of the League Wars* (1936) introduced the similar concept of 'totalitarian war', which aligned with Ludendorff's 'total war' tenets.[5]

Stig Förster defines the ideal of 'total war' as containing four elements in combination: total mobilisation, total war aims, total methods, and total control.[6] Total mobilisation includes the maximal ideological and industrial mobilisation of a state's resources, including military, civilian and industrial capacity, to wage war against an opponent.[7] The increasing destructive power from military technological advances, coupled with an industrialised economy and capacity for large scale production, were also seen as factors.[8] As exemplified in the Second World War, unconstrained war aims, including the requirement for unconditional capitulation and the destruction of the opposing state, provided mass mobilisation with total purpose.[9] The scope of war aims also changed, moving away from economic and territorial gains towards overall victory.[10] The use of any methods or means necessary to achieve total war dissolved the distinction between civilians and combatants, regardless of their legal status.[11] The impacts on military and civilians on all sides, often perpetrated because of perceived threats to a state's existence, were an important factor in the assessment of total methods.[12] The total control of a state's resources usually required different and greater subordination of citizens to the state, often under a military dictatorship, to achieve these mobilisation and war aims.[13] As military health practitioners, we need to remain aware what the likely impacts such a war would have on the military and broader society.

Our fourth issue of 2025 contains a range of articles on diverse topics spanning teleradiology, operational infectious disease, medical readiness, mental and spiritual health, and veterans' health. We continue to attract a good range of articles, including from overseas, as is demonstrated in this issue. 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 given at the Adelaide 2025 AMMA conference but welcome any articles across the broader spectrum of military health.

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

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Assessing Spiritual Wounds and Injuries

M J Davies

Abstract

This paper aims to provide some initial thinking on determining the basis for assessment of the existence, severity, and nature of a Spiritual Wound and Injury (SW&I) within an individual. The conditions, behaviours, and Red-Actions (serious, life-threatening, harmful) actions of an SW&I discussed in an earlier paper in this journal[1] require a thorough and rigorous assessment if they are to be managed effectively. The first step in developing this tool will be to review existing MI and spiritual assessment tools against the SW&I concepts discussed to date. Several existing assessment tools will be considered. While each has value and presents opportunities for greater understanding, none of them addresses the entire scope of a SW&I. Following this, the SW&I Assessment Tool - Provisional (SW&IAT-P) will be proposed, and its potential uses will be described. The proposed SW&IAT-P is a purpose-built and multidisciplinary tool that medical, psychological and spiritual practitioners can use. The SW&IAT-P is classed as provisional, as it will require further development that is outside the scope of this paper and the research conducted to date. The author seeks comments from all sectors on this paper.

Keywords: Veteran, spiritual, SW&I, ADF

Triage vignette

Imagine a scene where a soldier is brought into a deployed field ambulance on a stretcher. The stretcher is placed on a table surrounded by several different practitioners. In one scenario, the soldier is suffering a significant gunshot wound (GSW) to the stomach. Accordingly, the surgeon takes over. In another scenario, or perhaps at the same time, the soldier is running a high-grade fever, so a general practitioner steps forward. In yet another scenario, the soldier is assessed as clinically depressed, and so the psychologist or psychiatrist contributes to the treatment. Possibly, the soldier also shares that they are depressed as they feel that God no longer loves them because of what they have done.[2] At that point, a religious/spiritual practitioner (RSP) may take up their care as the soldier may exhibit a SW&I.[1]

There are a few points that need to be noted about this scene. First, it is highly likely that given the complexity of modern warfare, the soldier would be suffering from a number, if not all, of these conditions. While the most life-threatening will need to be dealt with first, the overall care of the soldier will be managed by a multidisciplinary team of appropriately trained and qualified practitioners. The course of treatment for some cases, such as the GSW, may initially seem obvious. However, each practitioner will invariably carry out a complex diagnosis and assessment process based on the requirements of their discipline. The thoroughness and rigour of those assessments will significantly contribute to the success of the management of the condition. As a part of that multidisciplinary team, the RSP will likewise need to complete their own equally rigorous assessment.

This is also not necessarily first aid and may be years after the initial trauma when the soldier has returned and is now a veteran. At that time, this scene may be played out in doctor's surgeries and consulting rooms, psychologists' offices or even a church rectory. Regardless of location, the first step for whichever practitioner will be to assess the situation thoroughly. This paper discusses a SW&I assessment approach for RSP and perhaps other supporting professionals such as medical doctors, psychologists and psychiatrists.

The initial focus of this paper will be to revisit the concept of the SW&I that was discussed in a previous article in this journal.[1] Following this, there will be a review of existing Moral Injury (MI), psychological and spiritual assessment cases and tools against the SW&I concept. A SW&I assessment tool, the SW&I Assessment Tool - Provisional (SW&IAT-P), will be proposed and its potential uses will be described.

The SW&IAT-P is classed as provisional as, although it has been based on the research to date, it will require further development. This will include confirmation of the steps and processes identified to this point, development of a more fulsome and robust set of

questions, and development supporting metrical analysis. These steps will all require the conduct of trials and evaluation activities. Community input and suggestions in this area will be most welcome.

SW&I

In a previous paper in this journal, the issue of spiritual damage occurring to veterans because of traumatic events was discussed.[1] To date, spiritual damage occurring to veterans because of traumatic events has been typically looked at through the lens of MI. While useful in part, this approach is not entirely appropriate or compelling, not least because it does not adequately cover spiritual dynamics such as the presence of God or a Divine figure. Further, the current MI paradigms seldom allow for consideration of spiritual damage outside of the aftermath of a morally injurious experience (MIE). MI is not a mental illness, and while some of its hallmark behaviours may respond to psychological, psychiatric, pharmacological or spiritual approaches, the essential basis of a MI lies in a disruption of a person's moral relationship with another person, group or society. Morality and spirituality are related but distinct terms. A SW&I focuses on a broken relationship between an individual and their concept of a God. As such, *MI is to the many as SW&I is to the one.*

Health, morality and spirituality are fundamentally different disciplines. MI does not fully address the impact of the spiritual damage upon the spiritual 'head and heart' of a person's identity. Recent research has suggested that head-and-heart spirituality are neither exclusive nor in competition, but one may be dominant depending upon an individual's spiritual, religious and cultural background.[3] In terms of heart spirituality, Madeline Anderson suggested in 2020 that there is a:

> *'Central and bidirectional relationship between the heart, the "Master Organ," and the phenomenology of spiritual experience. Further, we provide existing evidence for a synergistic, salutogenic relationship between robust cardiac function and spiritual well-being that may offer a roadmap to spiritual, psychological, and physical recovery and health at the individual, interpersonal and global levels'.*[4]

The concept of a spiritual heart is that an emotional experience may be influenced not only by the head but also by a heart-head axis. This influence should be recognised as spirituality and emotions are inextricably linked, and spiritual experiences are intertwined with the generation of positive emotions such as awe, appreciation and joy.[4] Joshua Daniel (2016) takes this idea of separation between head and heart further by highlighting differences in the approach to managing spiritual damage. He notes that, as 'PTSD [post-traumatic stress disorder] demands a medical response, an instance of professional expertise,' a 'spiritual wound, MI demands an in-kind response: on the one hand, spiritual, and so irreducible to head chemistry; on the other hand, communal, not a task to be delegated to professionals or experts'.[5] The implication here seems to be that spirituality is 'so irreducible to head chemistry' that linking it to psychological disorders such as PTSD and, by extension, psychiatric and psychological therapies such as MI are unlikely to provide appropriate responses.[5]

To comprehensively understand the effects of traumatic events on an individual's spiritual health, the previous paper in this journal proposed a new integrated term to describe such damage, 'Spiritual Wounds and Injuries'. The following definition of SW&I was introduced for further discussion:

> *'A Spiritual Wound and Injury (SW&I) occurs when an individual's perceptions of God, either through direct engagement (spiritual wound) or facilitated through a faith community (spiritual injury), are damaged or changed by an event or events. A spiritually wounded and injured individual may feel they have failed God by not acting in a way that would not warrant his love. Conversely, the individual may feel an omniscient, omnibenevolent, and omnipotent God deliberately chose not to help or support them and/or others in a way that would demonstrate his love for humankind as they would have expected, based on their spiritual schema. The fact that an individual loses faith in God is not the SW&I; rather, it is the effect that loss of faith has on some individuals' mental health and overall well-being and how that might present in behaviours such as substance abuse, depression, or anger'.*[1]

Not every individual has a religious or spiritual belief system. For those who do, threats to this system can significantly affect their lives. Visible behaviours such as substance abuse, depression or anger may follow a similar trajectory to conditions such as MI or other mental health concerns. However, their origin, nature and management will differ. The critical issue that separates SW&I from MI and mental health concerns is that SW&I is governed by head-and-heart spirituality and the individual's relationship with God.

SW&I assessment

There is anecdotal evidence that some RSPs feel uncomfortable using assessment tools such as the proposed SW&IAT-P.[2] Some RSPs feel that such assessment tools are the preserve of science-based practitioners such as psychologists and medical personnel, and they wish to be thought of differently. There is also a perception that such tools are more frequently used in a suicide management process. While the prevalence of this belief is unknown, RSPs need to become more comfortable with such tools. This is because such an approach is:

- **Foundational**. Tools such as the SW&IAT-P can provide a strong foundation for assessing the existence of a SW&I within a patient and the balance between spiritual injury (head) and spiritual wound (heart). In turn, this will also assist with selecting the best approaches to managing SW&I.
- **Equivalent**. RSPs work in an unscientific paradigm as opposed to their psychological and medical peers. Despite this, they must still be able to demonstrate to their peers that their management plans for the spiritual care of patients are based on equally valid needs assessments. This is particularly important if SW&I is to be approached as a part of the combined treatment process.
- **Multidisciplinary**. The author has previously discussed an example of a soldier who was feeling depressed because he thought that God no longer loved him.[2] In the event, this individual may have initially presented to a general practitioner as their concerns appear as depression, although their origin is spiritual. There is no presumption that tools such as the SW&IAT-P cannot be multidisciplinary tools used equally by spiritual, moral, psychological and medical practitioners. Indeed, such usage is to be encouraged as it is very much in line with the bio-psycho-social-spiritual treatment model.[6]

Types of current assessments

The American Psychological Association (APA) notes that there are two broad approaches to understanding potential conditions based on patient presentation. On one level, there are screening activities. Screening identifies individuals at potentially high risk for a specific condition or disorder that will indicate a need for further evaluation or preliminary intervention. Screening is neither definitively diagnostic nor a definitive indication of a specific condition or disorder.[7]

On the other hand, assessment refers to a complex activity integrating knowledge, clinical judgment, reliable collateral information and psychometric constructs with expertise in professional practice or application. Psychological assessment is a problem-solving process of identifying and using relevant information about individuals, groups or institutions for decision-making and recommendations.[7] Formal assessments seek to provide a complete clinical picture of an individual, focusing on the functioning across multiple domains. It aids in diagnosis and treatment planning by identifying problems and conditions, indicating their severity and providing treatment recommendations.

The same logic applies to SW&I. Accordingly, the SW&IAT-P will continue to be developed as a formal assessment and will seek to provide a spiritual picture of an individual that might aid in identifying problems and conditions and indicating their severity. Additionally, the SW&IAT-P may ultimately provide the basis for treatment recommendations. Several existing MI and spiritual assessment tools partially meet this need and provide a useful starting point for the discussion as they identify common trends and potentially relevant areas for inclusion.

Moral injury assessments

MI is still an evolving concept, and there is no generally accepted definition of MI. Likewise, there is no overarching structure or governance model for MI. As such, any assessment tools developed are not representative of the whole MI discipline but rather individual academic and, in some cases, institutional concepts. Despite this, there is a wealth of scholarship produced over the last 40-plus years, as well as several MI assessment tools that have been developed. The scholarship and tools are important as they may provide some insights into the eventual shape and structure of the SW&IAT- P. These tools are summarised in Annex A. The scopes of three of the most common and relevant tools are described below:

- **Moral Injury Symptom Scale-Military Version.** The Moral Injury Symptom Scale-Military Version (MISS-M) is a 45-item measure of MI symptoms. It was designed for both veterans and serving personnel diagnosed with PTSD. Like many MI-related tools, the link between MI and PTSD is often present. The MISS-M correlates strongly with PTSD severity, depression, and anxiety symptoms, indicating convergent validity, although it is relatively weakly correlated with social, spiritual and physical health constructs. Importantly, this is used to identify discriminant validity or the

discrimination concepts of measurements that are supposed to be related but are unrelated.[8]

The MISS-M consists of 10 theoretically grounded subscales that assess the psychological and spiritual/religious symptoms of MI. These are guilt, shame, betrayal, moral concerns, loss of meaning/purpose, difficulty forgiving, loss of trust, self-condemnation, spiritual/religious struggles and loss of religious faith/hope. The scale has high internal reliability, test-retest reliability and a factor structure that can be replicated. The MISS-M was the first multidimensional scale that measured both the psychological and spiritual/religious symptoms of MI and is a reliable and valid measure for assessing symptom severity in clinical practice and in conducting research that examines the efficacy of treatments for MI in Veterans and Active-Duty Military personnel. There is also a short-form version of the tool.[9,10]

- **Expressions of Moral Injury Scale-Military Version.** The Expressions of Moral Injury Scale-Military Version (EMIS-M) was developed to provide a reliable and valid means for assessing the warning signs of a MI in military populations. Using independent samples of veterans who had served in conflict environments, factor analytic results revealed two distinct factors related to MI expressions directed at both self (9 items) and others (8 items). EMIS-M scores demonstrate strong convergent, divergent and incremental validity. EMIS-M has provided a validated tool for assessing expressions of apparent MI subtypes in research and clinical settings. EMIS-M's development aims to advance the scientific understanding of MI while supporting innovation for clinicians to tailor evidence-based treatments and/or develop novel approaches for addressing MI in their work.[11]
- **Moral Injury Outcome Scale.** The Moral Injury Outcome Scale (MIOS) is currently under development by an international consortium. The aspiration is that the MIOS will be a measure of moral injury as a multidimensional outcome associated with exposure to potentially morally injurious experiences (PMIEs). Items will address six domains of impact, each with sub-components: alterations in self-perceptions (e.g., loss of trust in self as a moral agent); alterations in moral thinking (e.g., judgmental thoughts or appraisals of others); social impacts (e.g., expecting rejection or judgment); self-harming and self-sabotaging behaviours (e.g., engaging in risky behaviours); emotional aftermath (e.g., shame, guilt); and beliefs about life meaning and purpose (e.g., loss of religious or spiritual beliefs or practices). The first phase involved interviewing service members, veterans and mental health providers to generate initial content domains and 34 potential MIOS items. In the second stage of psychometric development, the 34-item version of the MIOS was administered to veterans and service members to examine reliability and items using exploratory factor analyses. Results from second-stage analyses led to a 14-item version of the scale.[12] The MIOS is currently undergoing its third and final stage of psychometric evaluation. The MIOS has demonstrated acceptable initial reliability and content validity.[13]

Spiritual assessment approaches

The World Health Organization's (WHO) *International Classification of Diseases (ICD), Eleventh Revision (ICD-11) 2019/2021* describes spiritual assessments as 'initial and subsequent assessment of well-being issues, needs and resources of a client.[14] It notes that the provision of this may include:

> *'Establishing of relationship/engagement with another, hearing the story, and enabling pastoral conversation in which spiritual well-being and healing may be nurtured, supported and companioning persons confronted with profound human issues of death and dying, loss, meaning and aloneness. Predominantly a 'ministry of presence and support' Pastoral counselling or education'.*[14]

While this is a useful description, as Carey and Cohen note, it is not yet widely used or discussed.[15] Additionally, the very nature of spiritual engagements makes them difficult to describe scientifically or even consistently. This is because such engagements are perception-driven. These perceptions relate to how some individuals see, feel or hear the voice of God in their lives. This may be directly from God or a Divine figure through either a 'still small voice' (1 Kings 19:11-13) or communications that are more dramatic and Damascene (Acts 22:6). Their perceptions may also be developed through the facilitation of faith and religious education and the guidance provided by RSP delivered on behalf of God or Gods. In this case, assessment may be easier because most Holy Scriptures and works of religions often specify or command what is 'right' and 'wrong'.

In both cases, the focus of the SW&I assessment does not refer to the validity of or the means through which the perception is formed. RSPs, regardless of their spiritual or religious affiliation, should initially seek to use spiritual assessment tools to understand

the nature of the SW&I and not to proselytise for their religion. This may come later if the specific nature of the SW&I necessitates such action and if the individual requests it. Likewise, non-spiritual practitioners of every discipline must accept that some individuals have faith or spiritual beliefs and should not seek to question or alter this. A tool such as the SW&IAT-P seeks to understand the effects upon an individual's spiritual health that may have occurred because of a TPE or traumatic event.

Several spiritual assessment tools have been developed. Like MI assessments, aspects of these tools may have some utility for developing the SW&IAT-P. These tools are summarised in Annex A. Additionally, the scopes of three of the most common and relevant tools are described below:

- **FICA Spiritual History Tool.** The FICA Spiritual History Tool was created by Christina Puchalski in 1996 to assist with efficiently integrating open-ended questions into a standard medical history and can be used by healthcare professionals. The FICA tool is based on four domains of spiritual assessment: the presence of faith, belief or meaning; the importance of spirituality on an individual's life and the influence that belief system or values has on the person's health care decision-making; the individual's spiritual community; and interventions to address spiritual needs.[16]
- **HOPE questions.** HOPE Stands for H = Sources of hope, strength, comfort, meaning, peace, love and connection; O = the role of organised religion for the patient; P = personal spirituality and practices; and E = effects on medical care and end-of-life decisions their religion. It also allows those for whom religion, God or prayer is important to volunteer this information.[17]

  HOPE Questions were developed as a teaching tool to help medical students, residents and practising physicians begin incorporating a spiritual assessment into medical interviews. The strength of this approach is that it allows for an open-ended exploration of an individual's general spiritual resources and concerns and serves as a natural follow-up to a discussion of other support. It does not immediately focus on the word 'spirituality' or 'religion'. This minimises barriers to discussion based on the use of language. These questions have not been validated by research.
- **Spiritual Index scale.** The Berg Spiritual Index (SI) scale is a guide to a patient-focused, scripted dialogue between a provider and a patient. It is different from other assessment tools in that it looks at culture and spirituality simultaneously. The SI is a self-assessment instrument that investigates the degree of difficulty a person has with eight spiritual injuries. These eight items are guilt, anger/resentment, sadness/grief, lack of meaning/purpose in life, despair/hopelessness, feeling that life or God has been unfair, worry over religious doubt or disbelief, and fear of death.[18]

Spiritual Wounds and Injuries Assessment Tool-Provisional: a new tool

Several robust assessment tools exist across the MI and mental health paradigms. The preceding discussion on existing spiritual and MI approaches to assessment raises some relevant points that should be considered for developing and using a SW&IAT-P. A separate spiritual assessment tool that seeks to develop a better understanding of the nature and effects of damage to a person's spiritual health following a traumatic event is still necessary. There are several reasons for this:

- Existing MI and mental health tools have undergone rigours evaluation and testing before being fielded. The MIOS, for example, is undergoing an international evaluation currently. The un-validated tests are still useful as a starting point as they highlight raw concepts that may be transferrable to SW&I assessment. As the SW&IAT-P is a new tool for a new field or discipline and may be a starting point for similar assessments, it will need to undergo a similar regime to the MIOS to be an effective measure of SW&I.
- Many of the MI and spiritual assessments use a form of Likert-type scale. This is a psychometric scale named after its inventor, American social psychologist Rensis Likert, and was developed for use in research questionnaires.[19] Typically, it is used to scale responses in survey research. Likert scales range from 1 to 10, with 3, 5 or 7 being the most common. Further, this progressive scale structure is such that each successive Likert item is treated as indicating a better response than the preceding value.[20] There is some criticism that the scale of the numbering system is arbitrary as there is no objective numerical base or distinction between number sets such as 1–2 or 3–4.21 This can be mitigated by broadening the scale from 1–5 to 1–10. The scale will support the initial aims of the SW&IAT-P, although it will be further qualified when the tool receives detailed testing.
- MI still reflects a robust scientific/medical approach that does not necessarily accord

with aspects of SW&I's more mysterious and amorphous aspects. Acknowledging these limitations, MI's more doctrinaire approach may suit aspects of a SW&I that relate to how individuals react to breaches of commandments and holy laws. If a tool such as the SW&IAT-P can use aspects of tools such as MIQM, MISS-M, EMIS-M or MIOS (when fully developed), it may help in determining if an individual's approach to spirituality is more head-based and reflective of religious education or upbringing. As such, a RSP with a stronger background in a relevant faith doctrine and dogma might be more appropriate to work with an individual bearing a SW&I of that nature.

- There are significant difficulties in measuring humankind's spiritual engagement with God/Gods. This is mainly because such engagement is deeply personal and not observable to third parties. Many of the available spiritual assessment tools are linked to specific medical conditions such as oncology and end-of-life. These may be difficult to translate into a veteran circumstance if those conditions do not apply. At the same time, there appear to be several potentially useful tools already available that may provide a useful basis. HOPE and FICA are well developed, although they are narrow in their coverage. The Spiritual Well-Being Scale, Spiritual Assessment Inventory, Spirituality Index of Well Being, and the Berg SI scale are comprehensive tools that should be used to add to the shape and structure of the SW&IAT-P.

Assessment tool criteria

The structure of the SW&IAT-P will inevitably evolve with the development of a more fulsome and robust set of questions supporting metrical analysis and the conduct of rigorous trials and evaluations. Initially, the provisional assessment will be developed using the American Psychological Association's guidance on the basic psychometric properties of tests.[22] This guidance indicates that the basic properties of tests should include the following:

- **Reliable**. Repeated administration of the test would yield the same result.
- **Valid**. Test scores adequately represent a test-taker's standing on the psychological variable of interest, e.g., an individual's level of anxiety.
- **Accurate**. The cut-off scores are used to indicate whether a test-taker has, or is at risk for having, a specific condition, e.g., to demonstrate that individuals with depression will score at or above a designated cut-off score.
- **Fair**. The extent to which the test scores are equally reliable and valid for various segments of the population. This is particularly important given that ADF veterans' range in age from 18 to 100 years of age.
- **Norm adequate**. Reference groups used to assist in test score interpretation adequately represent the population for which a test is designated.
- **Relevant**. Have information about the specific characteristics of the individual being assessed, e.g., race, gender, language, disability, etc.
- **Administered and evaluated**. Conducted by practitioners with expertise in test administration and scoring.

There is a further criterion that will need to be met. The Cambridge Psychometrics Centre also notes that tests must be standardised and free from bias.[22] This is important to note on two levels. Firstly, to ensure that the SW&IAT-P is not aligned or even reflective of a religious or faith bias. It must be applied in the same way that chaplaincy is in the ADF: the provision of 'spiritual and pastoral support to Army's people by bringing honour to the dead, comfort to the sick, hope to those in distress, and support to all'.[24] This spiritual and pastoral support is provided ecumenically and not just by specific RSPs to their specific faith group or denomination. Thus, the SW&IAT-P must be ecumenical. Related to this is any potential actual or perceived bias from the individual practitioner administering the test regarding their personal beliefs as to the overall existence of God and a spiritual domain. Just as not all veterans have such beliefs, nor will all supporting practitioners. The practitioner's conduct of the SW&IAT-P must be free from their faith, cultural or academic beliefs.

Next steps

SW&IAT-P is classed as provisional as, although it has been based on the research to date, it will require further development. This further development will likely involve refinement of the questions, the scoring mechanism and the overall approach. This will include confirmation of the steps and processes identified to this point, development of a more fulsome and robust set of questions, and development supporting metrical analysis, all of which will require the conduct of trials and evaluation activities. Cues for this review may be taken from the example provided by the development MIOS. Community input and suggestions in this area will be most welcome.

SW&IAT-P

The SW&IAT-P utilises many aspects of the MI and spiritual assessment tools discussed above and in Annex A. For example, it takes inspiration from the MIOS by addressing domains of impact, each with its sub-components. This includes alterations in self-perceptions and moral thinking, social impacts, self-harming and self-sabotaging behaviours, and emotional aftermaths such as shame and guilt. Additionally, it considers beliefs about life meaning and purpose and where these may have been influenced by the loss of religious or spiritual beliefs. Unlike some MI assessments, the SW&IAT-P is not structured to reflect or contribute to the assessment of medical or psychological conditions such as PTSD.

In terms of spiritual assessment, the SW&IAT-P, like Puchalski's FICA Spiritual History Tool, seeks to establish a tool that integrates open-ended questions into a standard medical history and can be used by other allied professionals for assessments. Applying the SW&IAT-P does not require deep or specialist theological or religious training or understanding. Berg's SI scale has also been an important guide for developing the SW&IAT-P because of its patient-focused, scripted dialogue between providers and patients. It is also an important influence on how it simultaneously looks at culture and spirituality. This a relevant consideration given that SW&I occur not just within the more common cultural dimensions of religion/spirituality and the characteristics of the broader society but within the complex, unique and multi-layered military culture.

The SW&IAT-P is an assessment instrument that investigates the degree of difficulty a person has with eight spiritual injuries. The SW&IAT-P is described in Annex B. While each of the tools identified in Annex A has value and presents opportunities for greater understanding, they do not look at the whole scope of what may be considered SW&I. The proposed SW&IAT-P is a purpose-built assessment tool for this task. When complete, the tool should be treated as a confidential document. The tool is segmented into administrative and assessment parts:

- **Part 1: client/patient details**. Information to identify the client and any factors that may influence the practitioner's subsequent management approaches. This includes a summary of the patient's military career and an identification of any traumatic events or incidents that may have contributed to their current mental health or physical well-being circumstances. A common feature of both MI and spiritual tools discussed above, it is administratively necessary to capture patient details. This process can also be used to provide important contextual information. For example, aligning deployments to particularly traumatic events or locations or identifying multiple deployments to the same region.
- **Part 2: spiritual approaches.** Parts 2 and 3 aim to determine the balance between the individual's spiritual schema and whether it is head- or heart-based. This is not disclosed to the client/patient. Part 2 relates to head spirituality. This is based on 15 questions on a 1–10 Likert scale. Initial/draft questions are subject to further consideration.
- **Part 3: spiritual approaches (continued).** As above. Part 3 relates to heart spirituality. This is based on 15 questions on a 1–10 Likert scale. Initial/draft questions are subject to further consideration.
- **Part 4: religious/faith affiliation.** This part aims to provide the practitioner with an understanding of an individual's faith or religious affiliation. This area is not generally covered in the spiritual assessment tools described above. However, it is an important guide for the practitioners as they may indicate biases or patterns of thinking that external parties inculcated.
- **Part 5: additional comments.** Free text space so that individuals may add any additional information they wish to disclose.
- **Notes for evaluation.** This is only for the practitioner and provides scoring and evaluation calculations, and space to complete a free text evaluation.

Conclusion

The present-day soldier who was brought into a deployed field ambulance on a stretcher will have a much higher chance of survival and full recovery than their peers will at any other time in history. Although weapons lethality is much greater than in any other period in history, so are the tools to remediate the effects of those weapons: helicopters for evacuation, a range of deployable diagnostic medical devices, advanced medicines and medical techniques. There is also a significant shift away from the often-punitive approaches to mental health that were characterised under the heading of shell shock.

Just as commanders will undertake a detailed assessment of the terrain and the enemy before choosing which weapon to use, those seeking to repair unseen wounds, such as MI or SW&I must also undertake such an assessment. To an extent, this is

already happening in the fields of mental health and MI, where there is evidence of a range of tested and validated assessment tools. The challenge is that the MI is not a codified discipline with a single definition and a range of approved processes. While this provides opportunities for flexibility in approaching MI, it cannot guarantee consistency. There are also similar tools in the spiritual space, although they still tend to follow a MI model and do not consider some of the fundamental aspects of SW&I that have been discussed to date, such as the singularity of a relationship with a mysterious and unprovable God, or that SW&I can occur before, during and after a traumatic event and not just in the aftermath.

This paper has proposed the use of a SW&IAT-P. This proposed approach allows a supporting RSP to better understand an individual's spiritual/religious schema to determine whether they have a SW&I because of their defence/military service. The tool also helps the practitioner to understand the nature, causes and extent of the SW&I. In turn, it will also help the practitioner to determine the best management approaches to their circumstances and how to efficiently work with other practitioners, such as psychologists or medical professionals involved in the care. As the SW&IAT-P is a new tool for a new field or discipline and may be a starting point for similar assessments, it must undergo a similar regime to the MIOS to effectively measure SW&Is.

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Annex A

Moral and spiritual injury assessment tools

Moral injury assessment tools			
Name	**Outline**	**Year**	**Principal contributor**
Searle-Vance Spiritual Assessment	Based on the Multi-Level Spiritual Assessment (MLSA).25 Seeks to identify the level of spirituality and the pattern and priority of Chaplain care required.26	2007	Robert Serle C. Garland Vance
Moral Injury Events Scale	The Moral Injury Events Scale (MIES) is a 9-item scale that assesses actions taken or not taken, or witnessing or being directly impacted by someone else's actions or inactions that violate deeply held notions of right and wrong. The MIES is anchored broadly to military experiences.27	2013	William Nash
Moral Injury Questionnaire-Military Version	The Moral Injury Questionnaire-Military Version (MIQM) is a 20-item measure that assesses exposure to presumptively morally injurious events and feelings associated with those events. The MIQM have primarily has been used in research and not clinical settings.28	2015	Joseph Currier
The Moral Injury Symptom Scale-Military Version (MISS-M)	A 45-item measure of MI symptoms for both veterans and serving personnel with diagnosed PTSD. Correlates PTSD severity, depressive symptoms and anxiety within social, spiritual and physical health constructs.10	2018	Harrold Koenig
The Expressions of Moral Injury Scale-Military Version (EMIS-M)	Developed to provide a reliable and valid means for assessing the warning signs of a MI in military populations. Using independent samples of veterans who had served in conflict environments, factor analytic results revealed two distinct factors related to MI expressions directed at both self (9 items) and others (8 items).11	2018	Joseph Currier
Moral Injury Outcome Scale	The Moral Injury Outcome Scale (MIOS) is currently under development by an international consortium Items will address six domains of impact, each with their sub-components: alterations in self-perceptions and moral thinking, social impacts, self-harming and self-sabotaging behaviours, and beliefs about life meaning and purpose.12	2021	Brett Litz

Spiritual assessment tools			
Name	Outline	Year	Principal author
Spiritual Well-Being Scale	A 20-item measure that assesses perceptions of spiritual quality of life. The measure has two subscales, Religious Well-Being and Existential Well-Being.29	1982	Raymond Paloutzian
FICA Spiritual History Tool	The FICA Spiritual History Tool is based on four domains of spiritual assessment: the presence of faith, belief or meaning; the importance of spirituality in an individual's life and the influence that belief system or values has on the person's health care decision making; the individual's spiritual Community; and interventions to address spiritual needs.16	1996	Christina Puchalski
Spiritual Assessment Inventory	A 49-item measure of spirituality with five factors: Awareness of God (19 items), disappointment in relationship with God (7 items), realistic acceptance of God (7 items), Grandiosity in relationship with God (7 items), and instability in relationship with God (9 items).30	2002	Todd Hall
Spiritual Coping Strategies scale	The Likert-type SCS scale comprises 20 items, each represented by the frequency and helpfulness of both religious and non-religious coping strategies.31	2003	Donia R Baldacchino
Spirituality Index of Well Being	Defines spirituality as a sense of meaning or purpose from a transcendent source. 12-item instrument measures perceptions of the spiritual quality of life. The scale is divided into two subscales: the self-efficacy subscale and the life-scheme subscale.32	2004	Timothy Daaleman
HOPE Questions	HOPE Questions were developed as a teaching tool to help medical students, residents and practising physicians begin the process of incorporating a spiritual assessment into the medical interview. HOPE Stands for Sources of hope, strength, comfort, meaning, peace, love and connection; O-the role of organised religion for the patient's P-personal spirituality and practices; E-effects on medical care and end-of-life decisions on their religion.17	2001	Gowri Anandarejah
Spiritual Health and Life-Orientation Measure	Spiritual Health and Life-Orientation Measure (SHALOM) is a 20-item survey that can be used in research and practice. SHALOM has four domains: personal, communal, environmental and transcendental, each of which contains five short statements.33	2010	John Fisher
Spiritual Distress Assessment Tool	The Spiritual Distress Assessment Tool (SDAT) is a 5-item instrument developed to assess unmet spiritual needs in hospitalised elderly patients and to determine the presence of spiritual distress. SDAT has acceptable psychometric properties and appears to be a valid and reliable instrument to assess spiritual distress in elderly hospitalised patients.34	2012	Stephanie Monod
Spiritual Index Scale	The Berg Spiritual Index scale is a guide to a patient-focused, scripted dialogue between a provider and a patient. SI is a self-assessment instrument that investigates the degree of difficulty a person has with eight spiritual injuries.18	2011	Gary Berg
Four FACTs Spiritual Assessment Tool	The Four FACTs Spiritual Assessment Tool combines the LaRocca-Pitts' Four Fs and the FACT spiritual assessment tool into a single tool. F-Categories: Facts (What are the facts of the patient's current medical or clinical; Feelings (How does the patient feel about their current medical or clinical situation?); Family/Friends (Whom does the patient consider to be family and friends?); and Faith (What is the patient's faith, belief, worldview or spiritual practice?).35	2015	Mark LaRocca-Pitts

Annex B

Spiritual Wounds and Injuries Assessment Tool-Provisional

The purpose of this tool is to allow your supporting practitioner to better understand your personal spiritual/religious schema to determine whether you have a Spiritual Wound and Injury (SW&I) as a result of your defence/military service. If so, the tool also helps the practitioner to understand the nature of the SW&I, its causes and its extent. In turn, it will also help the practitioner to determine the best management approaches to your circumstances and how to efficiently work with other practitioners, such as psychologists or medical professionals involved in your care. Please note:

- This assessment is not compulsory for the continued engagement and management with the practitioner(s).
- God, in this sense, refers to a spirit(s) or being(s) you believe control some part of the universe or life and are often worshipped for doing so, or something that represents this spirit or being.
- No value, precedence or authority is attributed to any religion or faith group or lack thereof.
- A Religious/Spiritual Care Practitioner is a multi-faith term that refers to a Priest, Pastor, Imam, etc.
- While the assessment is solely aimed and your care, not all sections need to be completed if the topic or material causes you discomfort.
- This assessment is to be completed by you or your authorised carer/support person (in your presence).
- This assessment form asks for three types of answers.
  - Single Responses where you cross the answer that most accurately describes your circumstances. For example:

    Part 4 – Religious Affiliation

    Agnosticism ☐
    Ancient Church of the East ☐
    Anglican ☐
    Animism ☐
    Apostolic Churches ☐
    Atheism ☐
    Aboriginal Churches ☐

  - Scaled answers

    Do you believe in a God, gods or spirit(s) or being(s) that directly controls some part of the universe/life?

    No ☐ Unsure ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ ☐ Absolutely ☐

  - Free text responses to expand on any answer

Part 1 – About you

Name:

Gender:

Date of birth:

Place of birth:

Language spoken at home:

Highest level of education:

Military Service Record (include dates, unit/ship, rank at time of separation)

Please describe any specific incidents or events that you feel may have affected your mental health or general well-being

Physical Health Concerns

	Do you have or have you suffered from	Do you consider this Service Related?
Cancer	☐	☐
Cardiovascular conditions	☐	☐
Vision conditions	☐	☐
Hearing conditions	☐	☐
Diabetes	☐	☐
Kidney conditions	☐	☐
Musculoskeletal conditions	☐	☐
Neurological conditions	☐	☐
Lung and respiratory conditions	☐	☐

Other chronic conditions: Please describe. Additional information can be added at Part 5:

Mental Health Concerns

	Do you have or have you suffered from	Do you consider this Service Related?
Mood disorders (e.g. depression)	☐	☐
Anxiety disorders	☐	☐
Personality disorders	☐	☐
Psychotic disorders (e.g., schizophrenia	☐	☐
Eating disorders	☐	☐
Trauma – related disorders (e.g. PTSD)	☐	☐
Substance abuse disorders	☐	☐
Other mental health conditions	☐	☐

Please describe. Additional information can be added at Part 5:

Self-Destructive Behaviours

	Do you have or have you suffered from	Do you consider this Service Related?
Have you ever had or acted on any impulses of intentional self-harm, self-injury, self-mutilative behaviour?	☐	☐
Do you have concerns about your alcohol consumption?	☐	☐
Do you have concerns about your anger management?	☐	☐
Do you have concerns about reckless or dangerous behavior?	☐	☐
Do you us recreational or more than prescribed levels of prescription drugs?	☐	☐
Have you ever attempted or undertaken any acts of Nonsuicidal Self-Injury	☐	☐
(NSSI) include self-cutting, burning, head-banging and severe scratching	☐	☐
Have you ever had suicidal thoughts?	☐	☐
Have you ever tried act upon suicidal thoughts?	☐	☐

Other acts: Please describe. Additional information can be added at Part 5:

Part 2 – Religious and spiritual approaches

1. Do you believe in a God, gods or spirit(s) or being(s) that directly controls some part of the universe/life?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

2. Does God directly control, shape or guide your decisions?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

3. Does God directly control, shape or guide your decisions?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

4. Is God the most important presence in your life?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

5. Does God communicate directly with you?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

6. When God communicates with you is the message clear?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

7. Do you believe in a God is a direct force for good in your life?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

8. Do you believe that God knows, sees and hears all of your thoughts?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

9. Do you believe that God can do anything?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. Does God love you?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11. Does God punish you?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

12. Has God failed you?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

13. Have you failed God?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

14. Have you been forgiven for your actions?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

15. Can you forgive God if you feel has failed?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Part 3 – Religious and spiritual approaches (continued)

1 Do you believe in a God, gods or spirit(s) or being(s) controls some part of the universe/life through a faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

2. Does God use through a faith or religious group or RSCP to control, shape or guide your decision?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

Does God use a faith or religious group or RSCP to control, shape or guide what happens in your life?

3. No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

4. Is your faith or religious or RSCP the most important presence in your life?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

5. Does God communicate with you through your faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

6. When God communicates with you through your faith or religious group or RSCP is the message clear?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

7. Do you believe in your faith or religious group or RSCP is a direct force for good in your life?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

8. Do you believe that God empowers your faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

9. Do you believe that your faith or religious group or RSCP intercedes with God on your behalf?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

10. Does God show his love for you through your faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

11. Does your faith or religious group or RSCP punish you?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

12. Has your faith or religious group or RSCP failed you?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

13. Have you failed your faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

14. Have you been forgiven for your actions by your faith or religious group or RSCP?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

15. Can you forgive your faith or religious group or RSCP if you feel it has failed?

No ☐ Unsure ☐ ☐ ☐ To an extent ☐ ☐ Largely yes ☐ ☐ ☐ Absolutely ☐

Part 4 - Religious affiliation

Agnosticism	☐	Humanism	☐
Ancient Church of the East	☐	Independent Evangelical Churches	☐
Anglican	☐	Islam	☐
Animism	☐	Judaism	☐
Apostolic Churches	☐	Latter Day Saints	☐
Atheism	☐	Mandean	☐
Aboriginal Churches	☐	Methodist	☐
Assemblies of God	☐	Nature Religions	☐
Baha'i	☐	New Age	☐
Baptist	☐	New Churches	☐
Bethesda Churches	☐	Pentecostal Churches	☐
Brethren	☐	Presbyterian	☐
Buddhism	☐	Rastafari	☐
C3 Church Global	☐	Ratana (Maori)	☐
Caodaism	☐	Rationalism	☐
Catholic	☐	Reformed	☐
Chinese Religions	☐	Society of Friends	☐
Christadelphians	☐	Revival Centres	☐
Christian Science	☐	Salvation Army	☐
Church of Scientology	☐	Seventh-day Adventist	☐
Church of the Nazarene	☐	Shinto	☐
Churches of Christ	☐	Sikhism	☐
Community of Christ	☐	Spiritualism	☐
Confucianism	☐	Sukyo Mahikari	☐
Congregational	☐	Taoism	☐
CRC International	☐	Temple Society	☐
Druidism	☐	Tenrikyo	☐
Druse	☐	Theism	☐
Eckankar	☐	Theosophy	☐
Ethnic Evangelical Churches	☐	Unitarian	☐
Foursquare Gospel Church	☐	United Methodist	☐
Free Reformed	☐	Uniting Church	☐
Full Gospel Church of Australia	☐	Wesleyan Methodist	☐
Gnostic Christians	☐	Yezidi	☐
Hinduism	☐	Zoroastrianism	☐

Other: Enter religion or faith here

No Faith or religious affiliation

Part 5 – Additional responses

Please add any additional information you wish to disclose.

Notes for evaluation

PRACTIONER USE ONLY

This is only for the practitioner and provides scoring and evaluation calculations and space to complete a free text evaluation.

Once complete, the whole document should be treated as CONFIDENTIAL

Overview

Part 1: client patient details. Information to identify the client and any factors that may influence your later SW&I management approaches.

Part 2: spiritual approaches. Parts 2–3 aim to determine the balance between the individual's spiritual schema and whether it is head or heart-based. This is not disclosed to the client/patient. Part 2 relates to head spirituality. This is based on 15 questions on a 1–10 Likert scale. Initial/draft questions are subject to further consideration.

Part 3: spiritual approaches (continued). As above. Part 3 relates to heart spirituality. This is based on 15 questions on a 1–10 Likert scale. Initial/draft questions are subject to further consideration.

Part 4: religious/faith affiliation. This part aims to give the practitioner an understanding of what faith or religious grouping an individual may feel affiliated with.

Part 5: additional comments. Free text space so that individuals may add any additional information they wish to disclose.

Scoring

Each answer is given a numerical value.

Do you believe in a God, gods or spirit(s) or being(s) that directly controls some part of the universe/life?

No	Unsure			To an extent		Largely yes			Absolutely
1	2	3	4	5	6	7	8	9	10

But each line should only have one rating.

Do you believe in a God, gods or spirit(s) or being(s) that directly controls some part of the universe/life?

No	Unsure			To an extent		Largely yes			Absolutely
☐	☐	☐	☐	☐	☐	X	☐	X	☐

Score Part Two by adding the total of each line.

1. Do you believe in a God, gods or spirit(s) or being(s) that directly controls some part of the universe/life?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	10

2. Does God directly control, shape or guide your decisions?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	8

3. Does God directly control, shape or guide your decisions?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	8

4. Is God the most important presence in your life?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	7

5. Does God communicate directly with you?

No	Unsure		To an extent			Largely yes			Absolutely	
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	7

6. When God communicates with you is the message clear?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	6

7. Do you believe in a God is a direct force for good in your life?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	6

8. Do you believe that God knows, sees and hears all of your thoughts?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	6

9. Do you believe that God can do anything?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	7

10. Does God love you?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	9

11. Does God punish you?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	8

12. Has God failed you?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	7

13. Have you failed God?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	9

14. Have you been forgiven for your actions?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	7

15. Can you forgive God if you feel has failed?

No	Unsure		To an extent			Largely yes		Absolutely		
☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	10

Score Part Three by adding the total of each line **115**

Interpretation

The interpretation of SW&IAT-P is based on the scoring of Parts 2 and 3 but is also shaped by the practitioner's observations and understanding of the client/patient. Generally,

- Higher scores responses on Part 2 of the SW&IAT-P may indicate a **heart-based spiritual** approach by the individual. This may require the RSP practitioner to utilise more spiritual counselling tools that engage with the client/patients to work through issues and responses. In accordance with World Health Organization's (WHO) *International Classification of Diseases (ICD), Eleventh Revision (ICD-11) 2019/2021.* This may include establishing of relationship/engagement with another, hearing the story and enabling pastoral conversation in which spiritual well-being and healing may be nurtured, supported and companioning persons confronted with profound human issues of death and dying, loss, meaning and aloneness. Predominantly a 'ministry of presence and support' pastoral counselling or education (ICD code 96087-00) [Major heading: 1869].
- Higher scored responses on Part 3 of the SW&IAT-P may indicate a **head-based spirituality approach** by the individual. Accordingly, RSPs may draw from the doctrine, dogma, religious ceremony and ritual and the context of religious philosophy and theology. This intervention contains the pastoral expressions of informal prayer and ritual for individuals or small groups, and the public and more formal expressions of worship, including Eucharist and other services, for faith communities and others. Elements of this intervention may include: '(a) private prayer and devotion', bedside 'Communion' and 'Anointing' services, and other sacrament and ritual expressions; (b) public ministry — Eucharist/Ministry of the Word, funerals, memorials, seasonal and occasional services (ICD code 96109-01) [Major heading: 1873]. While one approach may lead, given the results of the SW&IAT-P, RSP will need to be skilled in both areas as a blended approach is more than likely to be necessary.

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Changing Military Medical Standards – Are We Doing Harm?

R Worswick

> *'I am trying to arrange transport for two or three thousand "B" class men; they are absolutely unfit for service. Many of them do not disclose any organic disease upon a carefully conducted clinical examination, but are in and out of hospital, and are quite useless for front line, and practically useless for Home Service.…Far better no reinforcements be sent from Australia as they do no duty, and only cause congestion in our hospitals and Command Depots. The class of reinforcements you are sending are not up to the old standard. Headquarters AIF Depots report that 20 per cent are unfit for the front line.'*
>
> Major General Neville Howse, VC, KCB, Director of Medical Services, Australian Imperial Force, 30 March 1917.[i]

Introduction

Western militaries are facing an existential personnel crisis. Military personnel numbers are declining[i,ii] despite deliberate efforts by some nations to grow military capability in response to increasing geostrategic uncertainty.[2,3] This problem has two aspects—an inability to attract sufficient recruits and retain trained personnel, resulting in higher separation rates. Western militaries have two options to address these challenges. The first is to increase the attractiveness of the 'job offer', to convince more people to join, and to entice serving personnel to stay. Several initiatives attempt to do this, including increased remuneration, improved conditions of service, and use of completion/retention bonuses, but with limited success.[4,5] A key shortfall is that these initiatives are indiscriminate. In many cases, they benefit those who had already decided to enlist or those who had no intention of leaving the military.

If improving the attractiveness of a military career does not solve the recruiting and retention problem, the second option available to Western militaries is to increase the pool of personnel available for military service through initiatives such as changing military entry standards and retention of non-deployable personnel. Some recent changes to entry standards reflect improvements in the management of certain health conditions or the evolution of military roles. In contrast, others take a pragmatic approach to what were arbitrary decisions based on limited evidence. However, other changes represent a deliberate decision to lower entry standards.[6,7] While this may appeal to senior military leaders and bureaucrats who use 'head count' as a measure of effectiveness, there is increasing evidence of unintended consequences. These include increased personnel wastage, increased burden on under-resourced military health services, increased complexity for commanders and personnel managers, reduced military readiness and increased physical and psychosocial harm to military personnel.[8-11] This, in turn, results in increased incapacity among military veterans and an increased burden of care for veteran support systems. This paper examines the unintended consequences of these recruiting and retention initiatives.

Lowering entry standards

There is a long history of militaries setting high standards for enlistment and for good reasons. Military service, particularly conflict, places significant physical and psychological demands on an individual. Within military organisations, there is an imperative to preserve combat power, and one individual's incapacitation can compromise the mission and, importantly, place others at risk. Casualties (particularly non-battle casualties)

i The US Army achieved only 75% of its recruiting targets in FY 2022 and FY 2023 (see U.S. Army Recruiting Command).2 European nations are experiencing similar problems (see https://www.nzz.ch/english/europes-militaries-struggle-to-attract-the-next-generation-ld.1878300).

ii Data from the UK also shows that the UK Armed Forces have consistently fallen short of recruitment targets over the past 5 years (see https://ukdefencejournal.org.uk/armed-forces-recruitment-falls-short-of-targets).

also impose a logistic burden due to the need for evacuation. Thus, pre-enlistment fitness, medical, psychological and aptitude screening contributes significantly to the health and wellbeing of the fighting force.

Pre-enlistment screening serves two broad purposes: one, to identify candidates who are expected to complete training (i.e. screen in suitable candidates based on aptitude and physical fitness), and two, to identify candidates with health conditions that are at risk of deterioration in a military environment (i.e. screen out medically and psychologically unsuitable candidates). Pre-enlistment screening is important for other reasons. Militaries invest significant resources in recruiting and training personnel and want a return on this investment. Recruiting personnel who will not finish training wastes resources, and Western militaries set military entry standards to minimise attrition during training. There is also an ethical and legal perspective to this. Military service is physically and psychologically demanding, and this places individuals at risk of harm. The military has a duty of care (and a legal obligation under Work Health and Safety legislation) not to cause harm to predisposed individuals—*primum non nocere* (first do no harm).[iii] Military entry standards are critical in minimising harm.

There is a common adage that the military reflects the society from which it is drawn. Western societies are becoming increasingly sedentary and obese, and an increasing number of potential military candidates are unable to meet the fitness standards required for enlistment. For example, a 2020 US study found that 77% of young Americans do not meet military enlistment standards due to obesity, drug use, or mental or physical conditions.[5] To address these issues, several Western militaries have increased BMI (body mass index) thresholds for enlistment and 'lowered the bar' on fitness standards.[12] This represents a subtle change to the philosophy of pre-enlistment screening. Removing fitness and medical barriers to enlistment increases the number of candidates who can *commence* training, while accepting some may not *complete* training. However, this ignores the findings of numerous studies that demonstrate a strong association between poor physical fitness and medical discharge due to injury. For example, an Australian study found that the least fit recruits are 25 times more likely to not complete training than the fittest recruits.[13] Similarly, numerous studies have shown a strong positive association between obesity and physical injury.[14,15] By screening in unfit and/or obese individuals, Western militaries are causing harm.

To further increase the pool of candidates potentially available for enlistment, Western militaries have deliberately lowered medical and psychological recruitment standards and increased the cut-off age for enlistment.[16,17] This reflects a paradigm change in the second element of the pre-enlistment screening process (screening out unsuitable candidates). The unintended consequences of these initiatives are becoming increasingly evident. A Royal Commission into Defence and veteran suicide in Australia found that one in five serving members who died by suicide between January 2000 and January 2024, had been assessed as marginal, not recommended or not suitable for service from a psychological perspective[iv,8] It is not uncommon for pre-enlistment physical or mental health conditions to deteriorate upon enlistment due to the physical and psychological rigour of military service. A US study found that one-third of personnel discharged during initial entry training are separated due to a pre-enlistment medical condition and that individuals waived for knee pain and back pain, and depression and related disorders are at high risk of medical separation compared to their peers.[18] Lowering medical entry standards predisposes already at-risk individuals to injury. Thus, these initiatives are also causing harm.

Individuals with pre-enlistment physical and mental health conditions who complete *ab initio* training will require ongoing care during their military service and are more likely to have restrictions imposed on their employment within the military. This, too, has unintended consequences. Military health services are typically structured around ratios of care that presume the force is young and medically (and psychologically) fit. An older and increasingly complex 'military patient' demographic increases both the number and variety of clinicians required to care for the force. The increase in demand for physiotherapy and psychology services among Western militaries is evidence of this.[19-21] The cost of providing healthcare

iii This long-standing principle is reflected in the direction a senior Australian medical officer issued (in October 1915) to all medical staff conducting recruiting medical exams: 'that no man be allowed to pass the standard who is suffering from any disability, likely to be aggravated by service'. (See Butler, 1940)1

iv The Australian Royal Commission found evidence that a significant number of individuals—over 14 000 personnel (approximately 11% of total enlistees)—were assessed as 'not suitable' or 'not recommended' on psychological grounds, yet were enlisted during the 2001–2024 period (see Chapter 3, para 155).8

to military personnel will increase exponentially as enlistment medical and physical fitness standards are lowered.

A significant unintended consequence of lowering entry standards is the flow-on effect on the remainder of the force. Military posting cycles allow personnel to cycle in and out of 'ready' units and into training, staff and other roles. In addition to providing broader military experience and professional development opportunities, these roles provide respite from the physical and mental demands of operational units, and periods of family stability. Recruiting (and retaining) less deployable or non-deployable personnel limits the opportunities for 'medically fit' personnel to rotate out of operational units. Consequently, a smaller proportion of the force must shoulder a larger responsibility for operational readiness, leading to increased injury rates, burnout, low morale and adverse impacts on families and relationships.[8]

Ironically, the 'high achievers' are most impacted by this—their high performance is rewarded with a succession of (physically and mentally) demanding high-tempo roles until they abruptly reach (physical and mental) breaking point. This is the paradox of performance punishment—where purported rewards cause unintended harm—and it is an increasing phenomenon in Western militaries, particularly among NCOs, middle-ranking officers and more highly trained personnel such as special forces. These members are the organisational repository of military knowledge and operational experience. Initiatives intended to remediate military hollowness may well be exacerbating force structure deficiencies.

Lowering entry standards has significant consequences for commanders and managers, who deal with the human consequences of recruiting and personnel policy staff decisions. In addition to needing increased clinical care, these personnel need welfare support, and this is a command responsibility. Individuals with complex medical and psychological conditions require a disproportionate amount of command oversight at the unit level and personnel management intervention at the organisational level. Lowering entry standards necessitates bespoke personnel management solutions that provide increased opportunity for the individual but less flexibility for the organisation. Consequently, commanders spend considerable time managing complex individuals and less time commanding their force.[22]

Finally, lowering entry standards has significant consequences for organisations responsible for supporting veterans and the government funding that underpins this. Funding for organisations such as the US Department of Veterans Affairs (VA) and the Australian Department of Veterans Affairs (DVA) is derived from actuarial estimates that reflect previous (high) enlistment standards and are unlikely to take into account the impact of contemporary changes to recruiting standards. Lowering entry standards means the risk of physical and psychological injury increases. This, in turn, is likely to increase the number of veterans who are incapacitated at transition and unable to undertake civilian employment on discharge, leading to increased reliance on social and financial support. Further, it is well known that medical separation, chronic injury and incapacity adversely affect the mental health of veterans and are known risk factors for veteran suicide.[23,24] Lower entry standards potentiate each of these risk factors.

Retention of non-deployable personnel

Given Western militaries' difficulties attracting sufficient recruits, another method of maintaining personnel numbers is to stop (or reduce) out-flow by retaining personnel beyond (standard) retirement age and personnel with medical conditions that render them non-deployable. These initiatives mitigate the problem of corporate knowledge loss and allow military organisations to maximise the return on their training investment. However, these initiatives have flow-on effects and consequences similar to lowering entry standards.

From a healthcare perspective, older personnel and medically unfit personnel require more medical care and consume more health resources. Military health organisations have historically been oriented towards preventative medicine (treating the well) and acute care in the deployed environment (preserving the fighting force). Retaining older and medically unfit personnel introduces a requirement for chronic disease management and shifts the focus from deployed health care to garrison health care. This is evidenced by the evolution of the defence medical workforce over recent years. The number of uniformed clinicians (the deployable health capability) has remained constant, but there has been significant growth in non-uniformed clinicians supporting military forces in garrison locations. For example, an audit of health services support to the Australian Defence Force revealed a 25% increase in the contracted workforce during the period July 2019 to June 2022.[25] However, there is evidence that this workforce growth is insufficient to address the changing level of risk associated with recruitment policy, including lower entry fitness standards and use of medical waivers.[8] Many non-deployable

personnel require more medical care, which affects health staffing and resources.

Implications for defence health services

Changing military medical standards necessitate change throughout the continuum of military health care, commencing before enlistment. Initiatives to increase the pool of candidates eligible for military service and expedite the enlistment process, increase the risk of adverse health outcomes for aspiring recruits and increase the burden of care for military (and veteran) health organisations. The pre-enlistment medical assessment—physical examination, information gathering and clinical investigations—is crucial to make an informed medical risk assessment. It should not be waived nor deferred until after a candidate is enlisted because doing so places the individual at increased risk of avoidable harm and raises ethical concerns.

The recruiting crisis has led Western militaries to 'accept greater risk' regarding entry standards. However, this is disingenuous. The risk to the military is that the recruit will not finish training, and it will not get a return on its investment. However, as noted by a recent Royal Commission into Defence and veteran suicide in Australia, the real risk is being transferred to the individual, who is at increased risk of injury, increased risk of medical separation, increased risk of lifelong incapacity and increased risk of suicide.[8] While military service is inherently dangerous, military organisations have an obligation not to expose personnel to risks of unnecessary harm, yet lowering military entry standards exposes individuals to harm. This poses several ethical questions. Should an individual be enlisted if they are at increased risk of avoidable harm? If so, what number needed to harm is the military (and society) willing to accept? Further, if an individual is at increased risk of avoidable harm, is the military obliged to gain informed consent during the enlistment process?[26]

Lower entry standards make it necessary for Western militaries to have a process that links medical risk management to the safe employment of personnel across different military roles. This must be underpinned by a standardised medical classification system through which the military exercises its duty of care to the individual, based on a medical assessment of physical and psychological functional capacity, while also providing advice to commanders regarding limitations on employment. Several Western militaries use the PULHHEEMS classification system (or a derivative thereof). Developed in 1943 by the Canadian Armed Forces, it provides a concise and standardised medical assessment of potential recruits and serving personnel, particularly during en masse enlistment (e.g. mobilisation).2[7] Given the increasing complexity of the 'military patient' demographic, it is critically important that a standard classification system is applied through the recruitment process and into service. Importantly, it is critical to understand that its purpose is to inform commanders, not medical staff, because commanders are responsible for the health and wellbeing of their personnel.

Lowering entry standards and retaining non-deployable personnel results in an increased burden of military health care.[28] There is a requirement for additional resources for defence health services and a need to increase the health workforce across the military organisation, particularly at the *ab initio* (recruit) training centres and in locations where non-deployable personnel are concentrated (e.g. headquarters and training establishments). The composition of the health workforce must also change—both uniformed and non-uniformed clinicians—with an increased need for physiotherapists, psychologists, occupational physicians and vocational rehabilitation staff. The lowering of entry standards will increase personnel wastage rates. Therefore, there is also a need for a commensurate increase in the capacity of deployable health capabilities (particularly noting Major General Howse's observation that personnel of lower medical fitness '…do no duty, and only cause congestion in our hospitals and Command Depots').[1] Lowering entry standards will also increase the need for personnel to support medical discharge processes—resettlement training, post-separation health care, injury compensation claims, etc. This will extend into non-defence organisations that care for and administer services to veterans after they have left military service.

Lowering entry standards will necessitate increased health assurance checks to confirm health readiness and ensure that medical classification and employment limitations remain valid, ensuring personnel receive adequate care and that commanders are supported in their welfare and personnel management responsibilities. Unlike civilian clinical practice, where wellness is assumed and the health system is predominantly oriented towards treating the unwell, peacetime military medical practice is focused on caring for the well—confirming fitness to serve through preventative health care and early intervention. Importantly, these processes must ensure commanders at all levels (including government) are provided with a

realistic appraisal of military capability. In days of yore, military organisations required personnel to maintain a high medical classification, and had the liberty of discharging those that did not meet this standard. In the new era, an individual's medical classification is less relevant, but ensuring the medical classification is a true reflection of functional capacity is essential.

There is an urgent need for Western militaries to better understand the health and psychosocial implications of lower entry standards (and, to a lesser extent, retaining non-deployable personnel). As a relatively new initiative, the current organisational understanding of the consequences is informed by intuition, anecdotal evidence, case reports and short-term studies. While there may be a tendency to dismiss this as low-quality evidence, the findings of the recent Australian Royal Commission into Defence and veteran suicide suggest otherwise:

> *'We are concerned that reducing entry standards and granting a high number of medical waivers have the potential to increase the number of separations from the ADF, particularly involuntary separations, and increase the risk of suicide and suicidality for this cohort … Candidates who receive a medical waiver that allows them to join the ADF, by definition have … a higher risk category for physical and/or mental ill-health. The fact that defence does not monitor the progress of these recruits is frankly unacceptable.'*[8]

The defence health services are almost always the first to know when a uniformed member is suffering from physical or psychological distress. Therefore, from an organisational perspective, the defence health services are the 'canary in the coal mine' when it comes to understanding the implications of changes to military medical standards. Consequently, the defence health services should lead organisational efforts to better understand the implications of lower entry standards so this can inform changes to recruiting and retention policies. Initially, these efforts should focus on the *ab initio* training schools—the most vulnerable cohort of military personnel—as this is where trainee attrition rates are highest. Early studies should also follow trainees through the initial employment training schools (with a particular focus on the more physically and mentally demanding roles). The aim is to determine injury and attrition rates for trainees who enter the military under a medical (and/or fitness) waiver, identify those most at risk of harm, and provide the medical evidence to support changes to medical entry standards. Importantly, these findings may also inform changes to current training paradigms because it is becoming increasingly apparent that the status quo is not sustainable.

Finally, there is a need for defence health services personnel to take on an advocacy role, to represent the 'military patient' group who, under military culture, do not have a collective voice. It is critically important that defence clinicians (uniformed and non-uniformed) provide frank and fearless advice regarding potential harms arising from changes to military medical standards. This should start with a clear problem statement: military entry standards have been lowered (out of necessity), and this may be causing harm. Using euphemisms (e.g. 'We are not lowering standards, we are changing them.') fosters a culture of denial. It creates barriers to implementing changes that protect individuals from harm and improve organisational effectiveness.

Conclusion

In response to recruiting and retention difficulties, Western nations are changing personnel policies and military medical standards to increase the pool of potential recruits and to retain trained personnel who do not meet medical standards for deployment. Organisational needs, not medical evidence, drive these changes, and while these initiatives will increase the size of the force, they may not improve the effectiveness of the force. Recent conflicts in Europe and the Middle East confirm the significant physical and psychological demands of warfare. By lowering entry standards and retaining non-deployable personnel, there is a real risk of conflating personnel numbers and military capability. Recruiting and retention initiatives may fill the military establishment, but the reality is that this can hide organisational hollowness, particularly in the combat force.

Importantly, initiatives aimed at increasing the size of the force may have unintended consequences. Military medical standards are set at a high level so that individuals can withstand the rigours of military service and maintain the fighting force during conflict. High medical standards mitigate risk but do not prevent injury, and military forces accept that part of the force will be lost due to injury/illness. Lowering medical entry standards and retaining non-deployable personnel will increase injury rates, causing harm to predisposed individuals. This, in turn, will result in an increased burden on under-resourced military health services, increased complexity for commanders and personnel managers, and increased physical and psychological harm to military personnel. Ironically, initiatives

aimed at increasing the size of the force are likely to increase personnel wastage, incapacity among military veterans and the burden of care for veteran support systems.

Defence health services can (and must) play a leading role in helping commanders and personnel policymakers understand the health and wellbeing consequences of changes to recruiting standards and retention policies. Although these initiatives are relatively new, there is now sufficient data for epidemiological monitoring (albeit retrospectively) to understand the health impacts and to allow a more informed and evidence-based approach to changing recruiting and retention standards. With an obligation to 'first do no harm', defence clinicians are best placed to provide the evidence for change where it is safe to do so while also advising on the need to retain (or introduce) higher medical standards or changes to training paradigms, where it is necessary to protect individuals from harm.

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Psychological Assessment for Military Selection: Past, Present and Future Applications

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Abstract

Psychological assessments for selecting military personnel have played a crucial role in enhancing training effectiveness, ensuring job success and, where possible, reducing mental health casualties in war zones. This article traces the development of psychological assessment for military selection through the World Wars to modern-day procedures. Two main themes emerge from this analysis: firstly, military psychological assessment methods evolve swiftly during war due to the need for mass personnel processing. Secondly, the foundational structures and considerations from these periods of development remain relevant today. However, the theories and tools underpinning psychological assessment for military selection have evolved. Those involved in military psychological selection, therefore, require both an appreciation of its history and an understanding of current theories and tools to succeed in the field, particularly during the rapid development of new procedures. A stepped framework is proposed to guide the implementation and evaluation of psychological assessment processes for military selection. The framework is used to consider the future of psychological assessment for military selection, including in areas such as data aggregation and personality testing that may be targeted for greater effect and efficiency.

Keywords: psychological assessment, selection, military, personality testing, intelligence testing

Introduction

Organisations have long held a vested interest in selecting the right person for the right job, just as individuals have long wanted to choose the right vocation for themselves. For organisations, the right choice can result in decreased costs, increased efficiencies and, a healthier workforce and the possibility of finding those with the potential to become future senior leaders.[1,2] For individuals, it can result in greater satisfaction and, potentially, greater success with one's occupation and career.[2]

Within an organisational setting, the selection decision will often be guided by an assessment of the person-job fit (where a person's qualifications, needs, goals and values match the job) and the person-environment fit (the compatibility between a person and their environment, such as an organisation).[3] This interaction becomes significant for organisations that maintain a linear approach to career progression or offer a unique occupation due to the expected ongoing relationship between the organisation and the individual. Optimising this relationship between organisations and individual workers relies heavily on the effectiveness of initial recruitment and selection procedures.[4]

The military has played a key role in developing current approaches to organisation selection, particularly through psychological assessments. This expertise was driven by wartime demands to efficiently assess and place large numbers of recruits while attempting to minimise mental health issues on the battlefield and achieve mission success. The roles within the military profession of arms are generally unique to that organisation, as many of the roles are either exclusively conducted within its settings (such as for infantry) or have a substantial component of military training involved (such as for military health professionals). The military is, therefore, well placed to significantly influence who gets selected into certain occupations and roles. This is unlike most other professions where the role within one organisation competes with roles in other organisations, thus allowing individuals to move from one to another according to personal needs and preferences.

Understanding the origins of military psychological assessment provides valuable insights into the evolution of psychological assessment for selection within these environments, as well as its ongoing influence on selection practices at a societal level. Accordingly, this article explores the origins

and contemporary applications of psychological assessment in military selection for pre-employment and for selection into key military positions once employed. It consolidates the past, present and future of many psychological approaches to personnel selection in the military into a stepped framework, focusing on key historical events that have accelerated developments within this domain and remain relevant to its continuing evolution. It presents the framework as a starting point for consideration of psychological assessment methods—vital for those developing new assessment considerations for new roles or evaluating procedures that have existed for some time. It also utilises this framework to consider the future of psychological assessment for military selection.

The authors reviewed contemporary and historical literature, including journal articles, book chapters and 'grey' literature (documents not controlled by commercial publishing organisations such as internal reports[5]) that examined the use of psychological assessment for military selection. Literature was included if it specifically discussed psychological theories, procedures or tools used to assess candidates for military pre-employment or selection for key roles within the military. Additional references were utilised when there was a need to describe specific psychological tests or psychological selection procedures as part of the larger approach to psychological assessment for military selection. However, they did not meet the original criteria for inclusion. This additional literature has been restricted to psychology manuals or test administration procedures, or to specific psychological assessment standards and guidelines established by a definitive authority such as the Australian Psychological Society. The manuals and standards are not discussed at any length in this article; rather, they are used to better inform the use of psychological assessment for military selection.

As with much of the literature in this field, the definitions used within psychological assessment in selection have varied across time and place. This can affect the discussion or 'like' comparisons of techniques if not specifically addressed. The definitions used for the purpose of this review have, where possible, been drawn from definitive authorities and are included in Table 1.

Table 1: Definitions used with psychological assessment for selection

Psychological assessment	A behavioural and psychological evaluation, conducted in a certain sequence, of an individual in a particular situation so that the information derived from the assessment can help with making a decision or diagnosis.[46]
Psychological screening	Screening involves the broad identification of unrecognised irregularity, deficiency or disease by applying tests, examinations or other procedures that can be applied rapidly.[47]
Psychological tests	A systematic procedure for obtaining samples of behaviour, relevant to cognitive, affective or interpersonal functioning and scoring, and evaluating those samples according to standards.[8]
Assessment centres	Multiple assessment process involving several individuals undertaking a variety of activities, observed by a team of trained assessors who evaluate performance against a set of pre-determined, job-related assessment criteria.[27]
Negative selection	Negative selection removes unsuitable candidates from the selection pool and selects all others. It will typically focus on looking at the presence or absence of specific key criteria (such as educational levels, intelligence levels and professional qualifications), which are considered the minimum requirement to complete the training or role required. In psychology, it may also look for the presence or absence of current or historical psychopathology or critical events in a candidate's life history to determine the risk of developing psychological problems in the future.[48,49] Negative selection would generally be indicated when an organisation needs to employ many people and can tolerate a certain amount of failure in training or during probation, or if the candidates do not have any previous training or qualifications in the job and will be trained once employed.[50]
Positive selection	Selects those best suited for the role, rejecting all others, including those who may also meet criteria but are not considered to be the best candidate. It will look for the best candidates for the nature of the training or work required based on desired criteria that, in an employment context, is often drawn from job analyses, expert opinion and previous empirical findings.[48] Positive selection, and accordingly, the use of psychological assessment, would be indicated when there is more risk and higher returns associated with the job itself.

History of psychological assessment for the military—World War I

Prior to World War I (WWI), there was little evidence of any methodical approach to selecting recruits for the armies and navies of different countries. However, rulers tended to take an active interest in who was selected for the officer roles, often along the lines of fealty.[6] As standardisation of military selection procedures emerged, they tended to be focused on medical and educational standards for officers, with psychology (a new profession at the time) having limited impact.[6] This shifted with WWI when militaries started considering alternative methods for selecting large numbers of recruits. This shift occurred because the unprecedented scale of WWI demanded the timely mobilisation and deployment of large numbers of personnel. As part of this, medical staff were employed, initially to detect those who were of 'intellectual deficiency, psychopathic tendencies, nervous instability and inadequate self-control'[7(p89)] as part of their broader medical examination of recruits. In America, psychology—then in its infancy as a profession—was initially used to assist with identifying intellectual deficiency.

In 1917, the President of the American Psychological Association, Robert Yerkes, and his colleagues developed a group-administered intelligence screen to help with the war effort. This screen came to be known as Army Alpha, and the results were used by the United States Army to assign more than one million recruits to different roles to minimise training failure.[8] Army Alpha consisted of eight tests that measured verbal, numerical and reasoning abilities, practical judgment and general information (see Table 2 for more details). A second version, the Army Beta, was developed to assess those who were illiterate or did not speak English. Its usefulness in doing so was later questioned due to the heavy reliance on American cultural references unknown to many of Army Beta's target group;[9] demonstrating an early case of what would now be recognised as measurement bias.[10]

Table 2: Historical and contemporary psychological tests used by the military

Army Alpha	A group paper-and-pencil intelligence test consisting of eight subtests measuring practical judgment, general information and verbal, numerical and reasoning abilities, developed to objectively assess recruits entering the US Army in WWI.[8,12]
Army Beta	A group paper-and-pencil test intended to be equivalent to Army Alpha but for use with those who were illiterate or from non-English-speaking backgrounds.[8,12]
Army General Classification – Intelligence (AGCI)	An Australian Army devised group paper-and-pencil test designed to measure intelligence and, therefore, inform recruit allocation to military roles; first used in WWII and based on the Stanford-Binet test (itself an individual intelligence and cognitive-ability test first released in 1916).[20]
Command task	Groups of recruits would be given a practical task such as building a bridge over a stream in front of a panel of observers, and the panel would consider each individual's contribution as well as the quality of their interactions with other group members.[19,25]
Leaderless group discussion	Groups of recruits are given a topic and asked to discuss it with one another in front of a panel of people observing both the quality and quantity of individual engagement in that discussion.[19]
NEO-PI-3	A self-administered paper-and-pencil test with 240 statements on which individuals are asked to agree or disagree, with the intent of objectively measuring normal and abnormal personality traits based on the Five-Factor Model of personality.[46,51]
Progressive matrices	A non-verbal test measuring general intelligence and abstract reasoning, developed in part for use with minority and cross-cultural groups.[46]
Rorschach test	Best known as the 'inkblot test', individuals are shown inkblots in various shapes and colours and invited to talk about what they see, in the belief this would reveal their subconscious emotional state.[8]
Thematic apperception test	A test where an individual is shown a series of pictures, and they respond by writing a story about what they see, in the belief that this would reveal subconscious elements of their life related to personality.[8,52]
Word association test	Individuals are shown a word and invited to respond to it with the first word that comes into their head, in the belief that this would show subconscious conflicts within their personality.[19,52]

Note: This list is not exhaustive.

The original intent behind the use of Army Alpha and Beta was to identify those who were of very low intelligence (what we would recognise today as having an intellectual disability) or had significant mental illness and, therefore, were not suitable for selection into military service.[11] In time, Army Alpha and Beta were also used to stream recruits into different roles, including officer training,[11] due to its ability to screen out those who were unsuitable and provide information on the intellectual capability of each recruit.[7,12] The majority of these roles assumed that virtually no recruit had any previous training in warfighting, so they needed to be capable of learning how to fight as well as adapt to their specific military occupation. This approach was unique for its era and worked well for increasing training success,[13] so much so that the measurement of general mental aptitude within a selection assessment remains one of the key predictors of training success today, particularly with more complex and high-risk roles.[14] However, due to a limited understanding of mental illness at the time and a lack of accounting for combat-related stressors upon the individual's ability to complete their role, it was not successful at predicting success in the field.[15,16] It was also not used to select those for promotion due to a preference for those with seniority (or length of time served).[9] It was initially met with scepticism by some military members who preferred their own selection processes.[9,17] This, in turn, negatively affected the uptake of the tests in the military more broadly[6]

Both the United Kingdom (UK) and Australia's use of psychological assessment during WWI were minimal, as they relied primarily on individual preferences for job allocation.[17] Within the UK, some basic attempts at allocating individuals to specific roles relied primarily on their experiences and personal preferences rather than any scientific attempt to match individuals to roles.[17] For officers, there was a heavy reliance on recruits from the upper middle and aristocratic (in the UK) social classes. However, the high combat casualty rate eventually forced the militaries to consider recruiting more broadly.[17] In Australia, the profession of psychiatry did not exist far outside of the mental asylums of the time, and psychology was a little-known vocation.[13] Both Australia and the UK relied heavily on the unit commander or the unit medical officer to identify individuals already recruited but not coping with the stressors of military training prior to deployment into a war zone,[15,18] essentially making the training period prior to combat a period of 'probation'.[18]

The intervening years between WWI and World War II (WWII) saw a growing interest in the way selection of individuals for the military was conducted, due primarily to the large rates of 'shell-shock' (now known as post-traumatic stress disorder or PTSD) that had emerged from WWI and the accompanying impact this had on government costs for veteran welfare.[15,19] This did not translate to process changes at the time,[17] as the militaries had shifted to a peacekeeping size (i.e., smaller) approach to recruitment and selection.[17] However, Australia did take a close interest in what the other countries were doing for assessment and selection when WWII started, and the selection issues faced in WWI re-emerged.

History of psychological assessment for military—World War II

With the outbreak of WWII, there was a renewed need for the efficient placement of high numbers of military personnel again, and different countries began to study what other countries were doing. After trialling intelligence screening within its training units, a Directorate of Selection Personnel was established for the British Army in 1941 to organise the nation's approach to military personnel selection using psychological processes rather than relying on factors such as personal preferences.[20] With the new system, recruits would enlist into the General Service Corps (i.e. not allocated to any specific job) and then complete their basic training at a Primary Training Centre. While there, they would complete a battery of intelligence and aptitude tests and then be interviewed by a personnel selection officer, who recommended how the individual should be employed in the army. Those recruits who had low test scores or were perceived as being unstable were referred to a psychiatrist who could recommend either limited types of employment or discharge. This system aimed to ensure that service members were placed into jobs that made the most of their particular aptitudes (i.e., person-job fit), with less focus on identifying those who might be a psychiatric casualty.[21] The scheme appeared to be reasonably successful as a negative selection process, with only 1.4% of recruits rejected for intelligence or psychiatric stability concerns during the war.[21] However, despite its success in predicting military training success, the numbers of soldiers later diagnosed with combat exhaustion did not correspond with initial predictions made by psychiatrists at recruiting.[19] Much of this appeared to be due to the methods used by recruiting psychiatrists to determine the potential for developing mental health concerns during or after combat, which were not standardised and separate to the ability of screening to impact training

success. This highlights that while the British had found an acceptable means to assess for success in training, the system had failed in identifying those with mental health vulnerabilities to combat.

Australia, in particular, enjoyed success with its focus on psychological intelligence testing for recruits rather than psychiatric screening. The Permanent Air Force (later the Royal Australian Air Force or RAAF) was the first of the three services in Australia to introduce psychological testing in 1940 to tackle training failures in its potential aircrew.[22,23] A corresponding significant rise in successful completion of aircrew training was noted.[13,22,23] The Royal Australian Navy considered using psychological tests in personnel selection but decided not to pursue this as its intake and retention remained sufficient throughout the war.[22] Within the Second Australian Imperial Forces (2nd AIF, later the Australian Army), a commander of several Army specialist training schools in New South Wales seconded two psychologists to trial aptitude tests for recruitment, similar to those used by the Americans in WWI, and measure their relation to training outcomes. These tests eventually included the Australian Army's own intelligence screen (known as the AGCI; see Table 2), modelled after the Army Alpha and Beta but based more on the intelligence theories of the time.[20] Their early work successfully linked intelligence and aptitude test results with training outcomes. It was promising enough that the test battery was extended to allocating all recruits into various units and specialist arms of the service.[13] The battery of tests included intelligence, clerical (speed and accuracy), space form, and mechanical aptitude, and from this, an ability 'profile' was formed.[20] Psychiatric assessment would take place at this stage but only if the recruit's test scores were unusual (potentially from illiteracy) or from any behaviour observed by the examiners during testing that might suggest mental illness.[20]

By August 1944, this process had matured to the point that recruits that had been psychologically assessed as having a mental age below 11.5 years or having a degree of literacy no better than a grade three child were not enlisted into the Army.[20] This resulted in about 12% of those applying as recruits not enlisted, but the wastage of those deemed to be untrainable dropped from 5% to less than 2%.[20] A postwar review of these techniques suggested that the testing outcomes did not capture intelligence per se when compared to similar (not military) intelligence tests, which did not predict training success in the same manner but was a better indication of training success.[20] This suggests the continuing success of negative selection for assessment purposes regarding military training success when using intelligence and aptitude measures, noting that the assumption was that no prior military training had occurred in those being assessed. But, it was less successful in predicting job success over the longer term,[20] although much of this could again be attributed to lack of control over various job factors.

Officer selection was also redeveloped across the allied nations, mainly as a response to the number of officer cadets failing to complete their officer training and to better assess those interested in officer training but not eligible for consideration under older standards such as education or social class.[19] The British looked to Germany who, due to restrictions placed on the size of their militaries by the Treaty of Versailles after WWI, had subsequently developed a methodical approach to officer selection using psychological procedures.[6] They did this by creating assessment scenarios that tested the whole person rather than just snapshots of various traits,[17] under a positive selection process (see Table 1). As a result, in 1942, the UK approach to psychologically assessing recruits was extended to the establishment of boards to select officer trainees,[20] based in part on the success of the Alpha and Beta tests of WWI,[11] and in part on the German developments in the selection of its military officers.[17]

The British commenced using psychological tests such as the Ravens Progressive Matrices (see Table 2) for measuring intelligence and group tasks such as the Leaderless Group Discussion to test each person's character traits, temperament and abilities under pressure.[19] Known as the War Office Selection Board (WOSB), officer candidates would, over three days, undergo a series of intelligence tests, three personality tests (being the Thematic Apperception Test, the Word Association Test and the Rorschach Test, all of which rely on the psychologist's interpretation of the applicant's answer rather than a simple right or wrong answer[24]), and three 'military tests', including the Leaderless Group Task and the Command Task[19, 25] (see Table 2 for test details). They would then attend an interview with the Selection Board, which consisted of an army officer, a psychiatrist and a psychologist. After complaints about its relevance to selection, the psychologists discontinued the Rorschach Test from the battery[19] but continued with the Word Association and Thematic Apperception tests.

Despite some methodological shortcomings, such as a tendency by WOSB members to defer to the highest ranking person's opinion of candidates,[24] and a general ongoing distrust by some military leaders of psychiatrists and psychologists participating in

the selection of officers[19] (not unlike the scepticism expressed by some military leaders in WWI[17]), the WOSB proved generally popular with the military. It provided a valid stressful situation that could objectively test a candidate's potential in a way that appeared to relate to military service.[26] It was also the precursor to what is known today as assessment centres, where organisations use several methods and multiple assessors to measure an individual's response or output to multiple job-relevant assessment criteria.[27]

Facing similar training and staffing issues, particularly once Japan entered the war, the Australian Army used the WOSB as their model for selecting future leaders as officers. However, while the measure of intelligence, special aptitudes and education were important, the Australian Army also wanted an assessment of a person's qualities that could indicate potential leadership, such as ability, bearing, and personality,[20] based on the assumption that leadership was an innate individual characteristic rather than something to be taught.[6] Like the British system, Australian Army officer candidates spent three days undergoing similar aptitude and intelligence tests, medical tests and leaderless group tasks before being interviewed by a psychologist (for test results), a psychiatrist and two combat officers.[26] Personality tests used by the UK were trialled in Australia, including the Rorschach, but Australia later abandoned them due to concerns about their overall validity.[20,26]

While these procedures covered selection for enlisted and officer trainees, there was interest by numerous countries in expanding the processes further for high-risk and specialised roles such as intelligence and special forces. In WWII, the American Office of Strategic Services (OSS) was tasked with designing a structured method to assess necessary qualities for completing hazardous military jobs.[28] These qualities broadly covered motivation, effective intelligence, emotional stability, leadership and teamwork. Furthermore, the OSS explicitly acknowledged the unpredictable nature of both the roles and the environments within which the individuals would be working and tended towards a 'whole of personality' assessment rather than one targeted at specific job requirements.[28] These processes also borrowed from the WOSB, particularly around having selection staff observe candidates over several days and for leaderless group situations.[25,28] However, it was distinct from other selection methods due to its increased focus on the austere environments where they would eventually send their trainees and the unique skills they would need when they arrived (i.e., person-environment fit).[28] It also specifically considered the diversity of cultures they were recruiting (such as migrants and first-generation descendants), done primarily due to the need for deep undercover work in other countries.

The OSS process represents a significant advancement from the early Army Beta of WWI due to its closely considered approach to diversity as a positive factor, rather than treating potential diversity as a broad 'other' group that must be managed separately from English-speaking individuals. OSS also recognised that the performance of their recruits would depend in part on the personalities of their peers and the temperaments of their supervisors in addition to their traits, and thus selected (as far as possible) those who could manage a wide range of different people.[28] While this was not unlike what the WOSB was trying to achieve with its group tasks, the OSS approach recognised for the first time the impact of others on the individual during combat and selected its individuals accordingly.[28]

The OSS staff attempted to validate their methods via a range of tools including commander reports and a psychological interview with the individual when they returned from their assignments. They found (via the psychological interview) that their developmental history, political and social attitudes, and recent field experiences correlated with their adjustment in the field. However, commander reports were heavily biased towards whether or not they knew or got along with individuals and whether they were attracted to them (generally when the individual was female) and were, therefore, less useful.[28] This indicated the value of a more detailed psychological assessment in selection and demonstrated the importance of standardised assessment tools rather than relying on a single commander's report.

Analysis and contemporary approaches

Over the last decade or so, there has been an increased focus within the military and similar organisations on risk factors such as toxic leadership within the military,[29] and insider risk behaviours that can lead to counterproductive workplace behaviours, sabotage or worse.[30,31] As a result, psychology assessment procedures are increasingly being used where there is a lack of background information available (such as at recruiting) and a high level of risk of failure concerns where the outcomes could be dangerous, such as command appointments[29] and special forces.[14,32] Similarly, there is a shift away from the assumption that if a person has been found suitable for selection into a role or position once, that individual will always remain suitable.[31] Instead, more organisations are tending towards

re-assessment occurring at certain career stages or time served to be re-selected for the same role, in recognition of the impact of combat, life stressors or organisational factors potentially impacting a person's suitability for the job.[31] This approach reflects an increasing awareness of risk and how it may manifest in the military role, including how the stressors within the role itself may impact a person's ability to continue working in that role. Even in this area, reviewing the ongoing suitability for the role has elements of the work of the OSS in WWII, where they found the experience of the role can have an impact upon subsequent adjustment.[28]

A modern form of the WOSB is still used by the Australian Army today, and similar methods are used by other militaries worldwide.[33] Leadership research that was emerging at the time also appears to have influenced the development of subsequent WOSBs and assessment centres, primarily due to its emphasis on situation factors such as group composition, nature of the task, and early findings that intellectual capability, achievements, participation and sense of responsibility were associated with leadership.[6,34,35]

Much like the WOSB's impact on the modern-day assessment centres for organisations, the OSS methods also form part of the foundations for selecting high-risk personnel today.[14,32,36] Specifically, they also recognised the difficulties in developing selection methods or criteria for jobs and roles that were vague or not yet fully formed and where traditional methods such as biographical information on education or previous work experiences were unhelpful in predicting future job success.[28] Instead, they tend towards a more generic assessment with far more detail obtained to cover a wide range of known and estimated risks.[14]

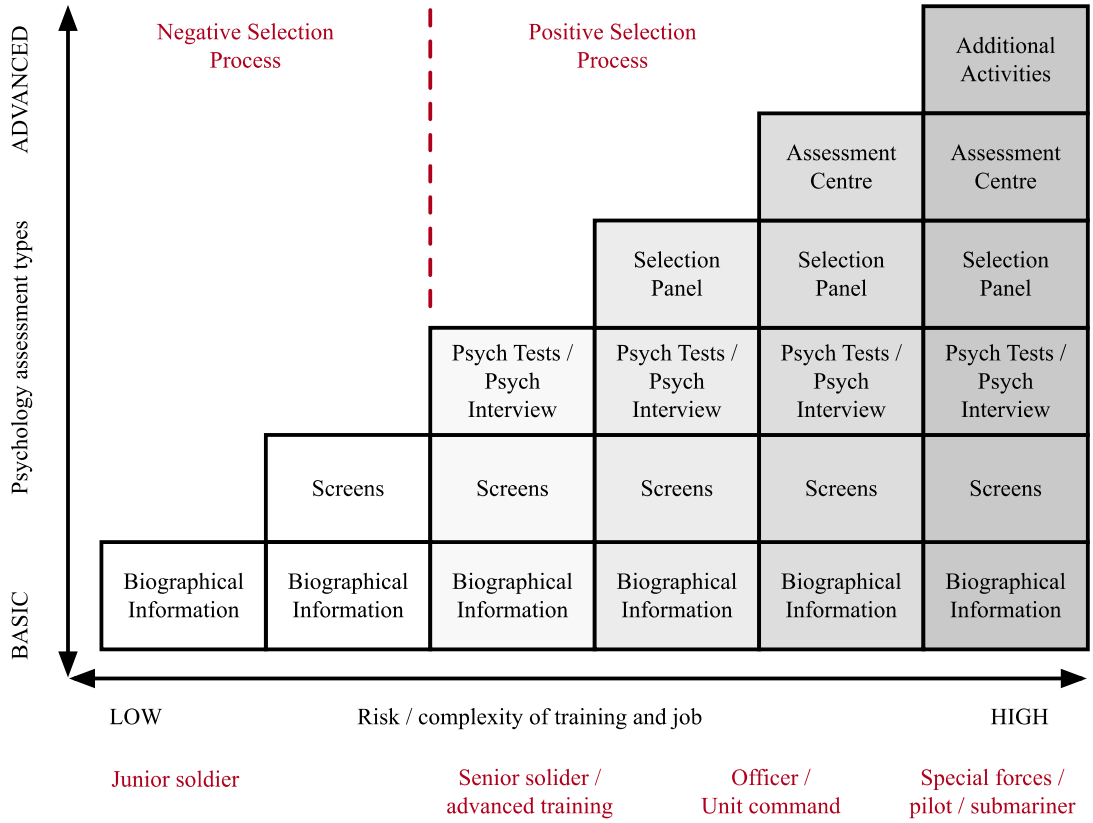
Of significance is how the work done by Yerkes and his colleagues in WWI[7,12] has impacted the subsequent approach to psychological assessment and selection. In particular, the ability of group-based intelligence screening to predict the success of training across a broad range of roles and vocations, from infantry soldier through to officer and high-risk positions, has led to a heavy focus on cognitive screening and assessment.[37] While we believe this has arguably increased in importance with the growth of information technology and similar technological advances in many military roles and vocations, it has potentially done so at the expense of non-cognitive psychological assessment approaches.

Personality testing has historically proven less reliable at predicting training success or future performance than other factors, hypothesised due to its early base in psychopathology rather than wellness.[6] This has shifted in recent times with two considerations: the first being the advent of the Five-Factor Model of personality, which has incorporated most of the previous trait models of personality into one larger theoretical structure,[38] with numerous accompanying validated tools such as the NEO-PI-3 (see Table 2) to measure it. Secondly, personality testing in high-risk roles has changed somewhat. Global personality traits are now measured to provide a broad overview of the individual to inform further assessment rather than having specific personality traits mapped against specific job requirements.[14] This has been found to enhance the validity of selection decisions for high-risk personnel[14] and selection for key roles such as unit command.[29] More recent developments in personality assessment and measures have indicated their increasing value in predicting 'soft' criteria such as interpersonal skills (vital for higher risk roles such as commanding officer and special forces where interaction with others is a key aspect of the role)[29,36] conscientiousness in completing their role,[14,37] and attrition.[37]

Several themes can be inferred from how the military has approached psychological assessment for military selection. Overall, there is genuine value for militaries to utilise psychological assessment tools and processes to select people for both the organisation and specific roles, as it has a positive impact on minimising training failure. This value can be significant in an age of budget restraints and economic costs. It has also provided some of the earliest examples of 'scaling up' and 'scaling down' of psychological assessment in a selection context, thus ensuring that the type of assessment is suitable for the various considerations of individual ability, person-job-environment fit and positive vs negative selection. This, in turn, forms the ethical basis of much of the use of psychological testing and assessment today.[10,27,39] Much like a set of building blocks, psychologists and organisations can visualise the use of psychological assessment in a military context as a stepped process, with the basic assessment types providing the foundations for the more advanced assessment types depending on the risk and complexity of the role, as shown in Figure 1.

There are also contemporary examples of the need to establish psychological assessment selection criteria for military roles where the nature of the role and tasks are emerging and thus not yet fully realised or understood. Cyberspace is a rapidly emerging domain within warfighting, and the ADF was initially required to set up psychological assessment methods for selection into cyber roles without a clear reference point or understanding

Figure 1: Stepped approach to psychological assessment in military selection



of how the jobs may evolve.[40] The essential criteria that were eventually substantiated included motivation, interpersonal ability such as teamwork, cognitive ability and maturity (including resilience and emotional stability)[40]—criteria not unlike those established by OSS during WWII,[28] and requiring a higher level of psychological assessment type due to the level of risk associated with the military role. Given the criteria's enduring use across various high-risk roles and decades, this also suggests that they may be emerging as solid factors for success in any military role that involves some level of risk or uncertainty. However, further work would be required to substantiate this.

Future focus

Our review of the evolution of psychological assessment in military selection has uncovered several pertinent themes that must be considered in the future of military psychological selection. Chief among them is that the most significant advances have occurred when the militaries have been pressured to recruit and select large numbers rapidly. This has forced psychology (and psychiatry) to look to the theories and tools of the day and make (sometimes significant) adjustments to them so they can be used to process numbers quickly and accurately.

As the roles have become more nuanced and complicated, so too have the requirements for more nuanced and complex psychological methods for selection, as shown in Figure 1. Importantly, it also points to the requirement to review these selection methods to not just validate their claims to what they purport to measure (for example, the measure of intelligence claiming to show job success but measuring training success) but also that those measures have kept pace with developments in psychology more broadly (such as the use of personality measures in high-risk roles). These lessons are learned repeatedly throughout history and are likely to be 'rediscovered' once again when the next rapid military expansion or change in roles for deployment is required.[19] The stepped framework, outlined in Figure 1, provides a structure in which to map new and emerging psychological assessment methods to ensure enough information is gathered, but not so much that the privacy of the individual is ignored or that psychological resources are deployed unnecessarily.

Many considerations of the 'future of psychology' tend to be incremental; they look at what has gone before, such as paper-and-pencil tests, and imagine it being administered via computer instead.[41] Much of the discussion in this area then focuses on the reliability

and validity of such new application methods. This is a vital aspect of psychological selection methods, and its importance in maintaining confidence in psychological assessment for selection is significant. However, there runs a risk that this is the only aspect that may be considered – essentially going back and 'cleaning up' after a large and significant body of work has already occurred. This is not unusual and, in fact, is encouraged as a process of 'lessons learned',[42] particularly during eras of peacetime in the military. But this may be a version of analysing the trees and missing the forest before them. The validation of what has occurred is important, but so is the bigger picture of the work conducted, its implications for developing both psychological theory and tools, and where this may lead.

Evolutions such as the use of computers have allowed for processes to be automated or administered differently—test responses may be entered and graded by a computer program or interviews conducted over video links. This does not essentially challenge the concepts underpinning psychological assessment for selection, simply its application. Roles within the military have changed, sometimes quite significantly, in response to technological and warfighting developments. Again, the processes used to select into these roles have not shifted, but the tools have evolved and, in many cases (such as appreciation of risk), have become more nuanced. We also continue to use the training period to inform our overall selection assessment. In most cases, we rely on realistic training to provide a real-time environment to determine the same characteristics for negative and positive selection.

We know it is challenging to accurately predict the medium- to long-term outcomes of a person's success (or otherwise) in a job or career. This is because numerous factors that can impact it are either beyond the individual's or the organisation's control, or cannot even be measured, let alone predicted.[43,44] However, with the rapid expansion of both Large Language Models (LLMs) within Artificial Intelligence (AI) and the prolific use of online data of individuals that inform the algorithms of many organisations, there exists the potential to harness this new, unprecedented level of information to inform an entirely new approach to psychological selection. There may be variables that we have not previously considered or have been unable to measure that are crucial to ensuring the best person-job-environment fit for a more extended period than we have currently. Similarly, there may be ways we can either see real-life behaviour in real time or, in the case of the military, use realistic simulated scenarios to determine the future actions of individuals and groups without requiring paper-and-pencil testing or similar. This is suggestive of a more pre-theory (a broad concept that focuses on a field of research) vs post-theory (which gives the concept a specific meaning and makes it quantifiable)[45] approach to developing psychological selection. Arguably, the military is one of the best-placed organisations to embrace both pre- and post-theory, given its history of innovation in psychology assessment for selection during conflict. Further, Figure 1 provides a structure to consider the developments that occur, particularly within pre-theory approaches to psychological assessment. However, these must be done under strict ethical guidelines and within a theoretical framework to ensure that post-theory consolidation occurs rapidly and accurately.

In conclusion, the military has been at the forefront of developing psychological assessment procedures for job selection—particularly for large recruitment drives, leadership roles and high-risk roles— still in use today both within the Australian military and across the developed world. Out of necessity, psychological assessment procedures tend to evolve rapidly during conflict, with group intelligence screening for mass recruitment emerging during World War I and broader assessment procedures developing during World War II. Many of the foundational structures and considerations from these periods of development remain relevant today. This stands testament to the robustness of the procedures and the applicability of those traits identified during times of war throughout other organisational domains. However, the theories and tools underpinning psychological assessment for military selection have evolved. Therefore, those involved in military psychological selection require both an appreciation of its history and an understanding of current theories and tools to succeed in the field, particularly during the rapid development of new procedures. A stepped framework is used to consider the future of psychological assessment for military selection, suggesting areas such as data aggregation and personality testing that may be targeted for greater effect and efficiency.

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Injuries, Physical Fitness, and Body Mass Index in a Population of U.S. Army Reserve Personnel

A Schuh-Renner, T Grier, O Mahlmann, R Waring, M Canham-Chervak

Abstract

Introduction: US Army Reserve personnel are expected to meet the same fitness and readiness standards as their Active Duty counterparts, but little is known about health factors among Reservists. This investigation presents data on injuries, fitness and body mass index (BMI) for Reservists participating in a new health and fitness program.

Methods: Twenty-one US Army Reserve units were selected to participate. Electronic surveys were administered in 2021 to collect baseline data on recent injuries, fitness and demographics. Demographics and injury details were summarised. Differences in injury prevalence by BMI and aerobic fitness (Army Combat Fitness Test (ACFT) 2-mile run time) were reported.

Results: Among the 2095 baseline survey respondents, most were male (72%), white (60%) and 30 ± 10 years old on average. More than a quarter of men (28%) and over one-third of women (35%) reported at least one injury in the previous 12 months. Commonly reported injuries included strains (19%) and sprains (12%), often involving the lower back (21%) or knees (19%), and were frequently attributed to running (22%) or weightlifting (18%). Over half of respondents (57%) passed the ACFT. About one-quarter of men (24%) and 16% of women were classified as obese. Men and women classified as obese had an injury prevalence 1.6 times higher than those with normal BMI ($p<0.001$). Likewise, injury prevalence among women with slower 2-mile run times was 1.6 times higher than the fastest runners ($p<0.05$).

Conclusion: Injuries in this sample of Reservists were similar to those reported in other military populations despite differing exposures and demographic distributions. Maintenance of a healthy weight status should be emphasised for Reservists, along with appropriate physical training resources for military duties. These results should inform future public health programming in the US Army Reserve.

Introduction

The United States (US) Army Reserve Command (USARC) is a unique population that is not often included in standardised US Army medical data surveillance. Nearly 170 000 US Army Reservists serve in units located across all 50 states and five territories.[1] Most US Army Reservists serve part-time, one weekend per month and two weeks per year, often holding civilian occupations in addition to military service. However, Reserve personnel may be deployed to full-time Active Duty (AD) service.[1] As a result, US Army policy requires Reservists to meet the same fitness and readiness standards as their AD counterparts, including successfully completing the Army Combat Fitness Test (ACFT). The ACFT consists of six events; each individual event must be passed to pass the test.[2] Reservists are required to pass the ACFT annually in order to remain active and be eligible for promotion.[3]

Despite the importance of readiness for all military troops, most US military health surveillance and investigations are focused on AD personnel. Therefore, less is known about injuries, physical fitness and other health factors among US Army Reserve personnel.[4] Medical encounter surveillance indicates that injuries are the leading reason for medical visits at Military Treatment Facilities among US Army Reserve personnel,[5] though this does not capture injuries treated outside of the Military Health System. Previous studies of Reservists indicated that, on average, Reservists are older,[6] have higher body mass index (BMI),[6,7] spend less time performing physical training,[8] and are less physically fit based on physical fitness test performance[4, 8] when compared to AD personnel. Studies of Reserve members from the Australian and British Armies have suggested similar trends and also explored injury data,[9-14] but comprehensive details about injuries and fitness

among US Army Reservists have not been previously reported in the literature.

Injuries are consistently a leading reason for medical care among AD Army Soldiers, leading to over 2 million medical encounters and 8 million days of limited duty annually.[15] A majority of injuries among AD Soldiers (~70%) are musculoskeletal overuse injuries,[15] often resulting from physical training. Higher BMI and slower 2-mile run times (i.e., lower aerobic fitness) have been associated with increased injury risk in AD US Army populations.[16-18] However, these relationships have not been extensively investigated for Reserve personnel. This article summarises relationships between injuries, physical fitness and obesity among a cohort of US Army Reservists.

Methods

This project was reviewed and approved as public health practice by the Public Health Review Board of the authors' institution (PHRB #20-876). Informed consent was obtained from all respondents prior to participation. An electronic survey was administered from July–December 2021 to US Army Reserve units participating in the baseline portion of a new health and fitness program, and results were briefly described previously.[19] USARC identified 21 participating units. Data collected included demographics, recent ACFT performance,[20] and details about injuries in the previous 12 months. Survey data was used for all metrics for consistency, as self-report is the most feasible way to collect comprehensive injury data for this population since Reservists may not always utilise Military Treatment Facilities for medical care.

Injuries were defined as bodily tissue damage resulting from an external energy transfer, either occurring suddenly (acute) or gradually developing over time (overuse), in accordance with the standardised military surveillance injury definition.[21] Respondents provided information for up to two of their most physically limiting injuries in the 12 months prior to survey administration, including injured body area, type of injury and activity causing the injury. The five most frequently reported injury types, injured body regions and injury activities are summarised.

SPSS© v.26 was used for all statistical analyses. BMI distribution and ACFT performance statistics are presented and stratified by sex. BMI categories were defined by the Centers for Disease Control and Prevention[22] and Army Body Composition Regulations,[23] using reported height and weight. ACFT pass/fail status was determined using 2021 scoring standards,[24] and only respondents reporting complete data for all events were included in the analyses. ACFT 2-mile run performance was binned into equal quartiles for analysis. Injury prevalence is reported by BMI and ACFT 2-mile run performance for both sexes. Chi-square tests were used to analyse statistically significant differences in frequency data. Unless noted, averages are reported as mean ± standard deviation (SD). Statistically significant differences were identified by $p<0.05$.

Table 1. Demographics of Pilot Program Reservists

Categories	n (%)
Sex	
Male	1517 (72)
Female	563 (27)
Prefer not to answer	15 (1)
Race	
White	1251 (60)
Black	593 (28)
Other	251 (12)
Age	
<25	706 (34)
25-34	784 (37)
35-44	384 (18)
≥45	221 (11)
Rank	
Junior Enlisted (E1-E4)	980 (47)
Senior Enlisted (E5-E9)	632 (30)
Junior Officer (O1-O4)	410 (20)
Senior Officer (O5-O6)	47 (2)
Warrant Officer or Other	26 (1)
Marital status	
Single, never married	1047 (50)
Married	806 (39)
Other/unknown	242 (11)
Highest education level	
High school or less	980 (47)
Associate's degree	358 (17)
Bachelor's degree or higher	708 (34)
Other/unknown	49 (2)

Table 2. Leading injury types, injured body parts and injury activities by sex (n=858 injuries among Pilot Program Reservists)

Male respondents n=589 injuries n (%)		**Female respondents n=269 injuries n (%)**	
Injury type			
Strained muscle	120 (20)	Strained muscle	43 (16)
Sprained joint	80 (14)	Overuse muscle pain	27 (10)
Pain	66 (11)	Sprained joint	25 (9)
Runner's knee (pain on/around the kneecap)	41 (7)	Pain	25 (9)
Overuse muscle pain	31 (5)	Fracture	10 (4)
Injured body part			
Lower back	128 (22)	Knee	54 (20)
Knee	119 (20)	Lower back	49 (18)
Shoulder	67 (11)	Shoulder	38 (14)
Ankle	45 (8)	Ankle	20 (7)
Foot	32 (5)	Foot	18 (7)
Injury activity			
Running	128 (22)	Running	62 (23)
Weightlifting	106 (18)	Weightlifting	45 (17)
Lifting heavy objects	65 (11)	Lifting heavy objects	35 (13)
Sports	31 (5)	Walking/hiking	13 (5)
Walking/hiking	19 (3)	Sports	21 (8)

Table 3. Army Combat Fitness Test (ACFT) performance by event and sex (n=1187 Pilot Program Reservists with complete ACFT data)

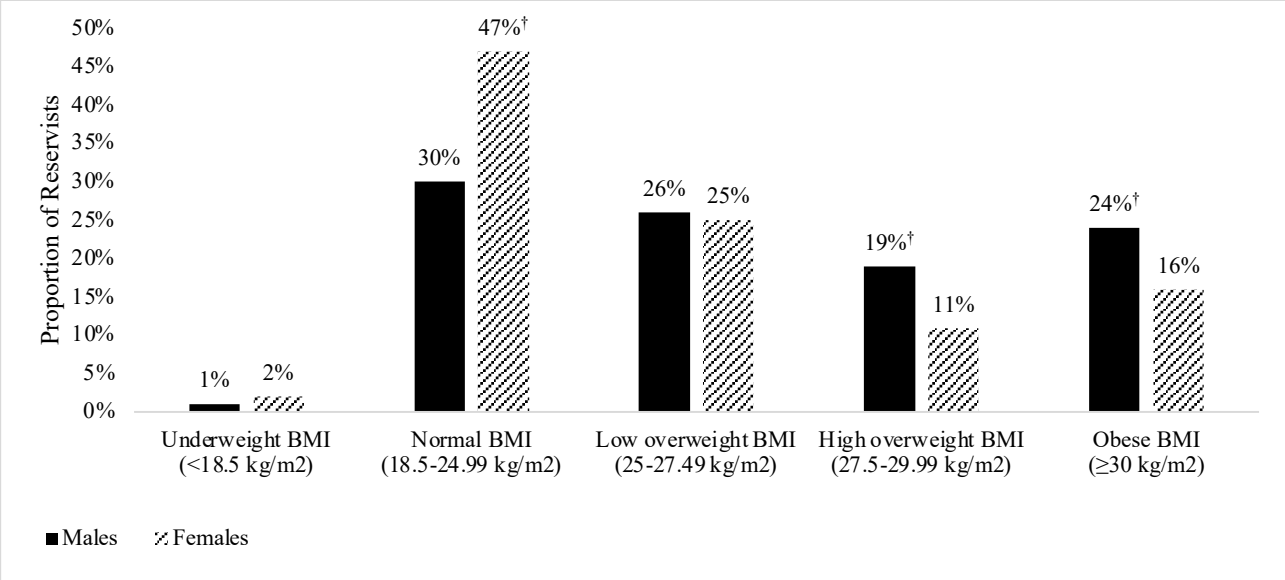
ACFT event	**Males**			**Females**		
	Participants (n)	**Average performance**	**Pass (%)**	**Participants (n)**	**Average performance**	**Pass (%)**
Deadlift (pounds)	914	202 ± 70	94	273	156 ± 38	91
Power throw (metres)	914	9.5 ± 2.5	99	273	6.1 ± 2.5	83
Hand-release push-ups (repetitions)	914	29 ± 14	99	273	19 ± 10	99
Sprint-drag-carry (minutes)	914	2:24 ± 1:26	91	273	2:46 ± 0:38	74
Leg tuck (repetitions)	911	7 ± 6	94	273	2 ± 4	47
Alternate: Plank*	21	-	81	85	-	77
2-mile run	881	17:47 ± 2:53	92	268	20:07 ± 3:11	71
Alternate: bike or row†	33	-	55	6	-	50
Overall¥	914	-	78	273	-	48

*In this version of ACFT, those who failed the leg tuck event could participate in an alternate plank event.

†ACFT participants on profile for the 2-mile run event could participate in an alternate aerobic event.

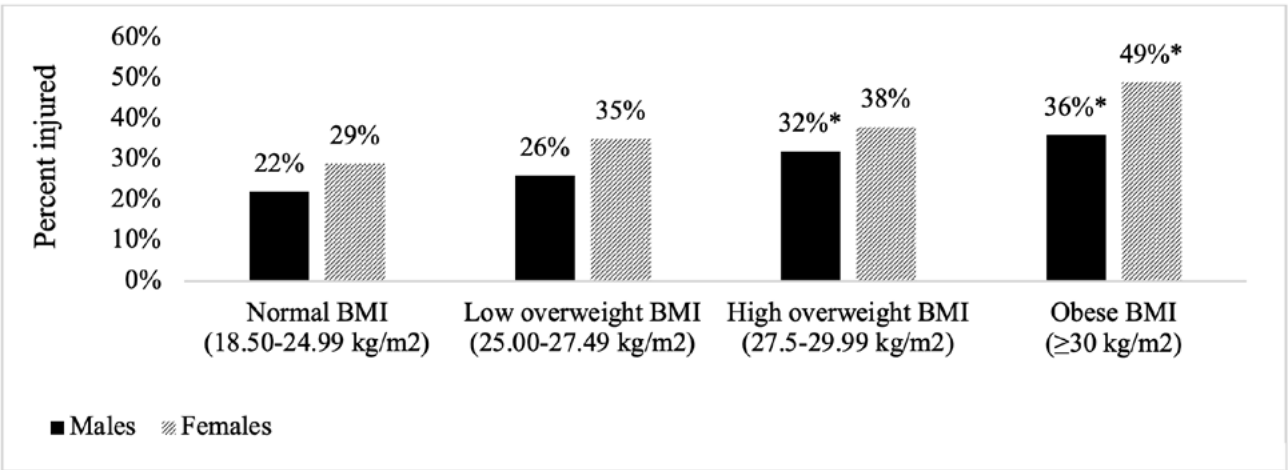
¥Passing all events was required to pass the ACFT overall.

Figure 1. Distribution of BMI by Sex (n=2,080 Reservists; Males n=1,517, Females n=563)



†Indicates that the proportion of Reservists in the BMI category is higher compared to the proportion for the other sex ($p<0.001$).

Figure 2. Percent Injured by BMI (n=2,080 Reservists; Males n=1,517, Females n=563)



*Indicates that the proportion of Reservists reporting at least one injury is higher than the proportion injured among those who reported normal BMI ($p<0.05$).

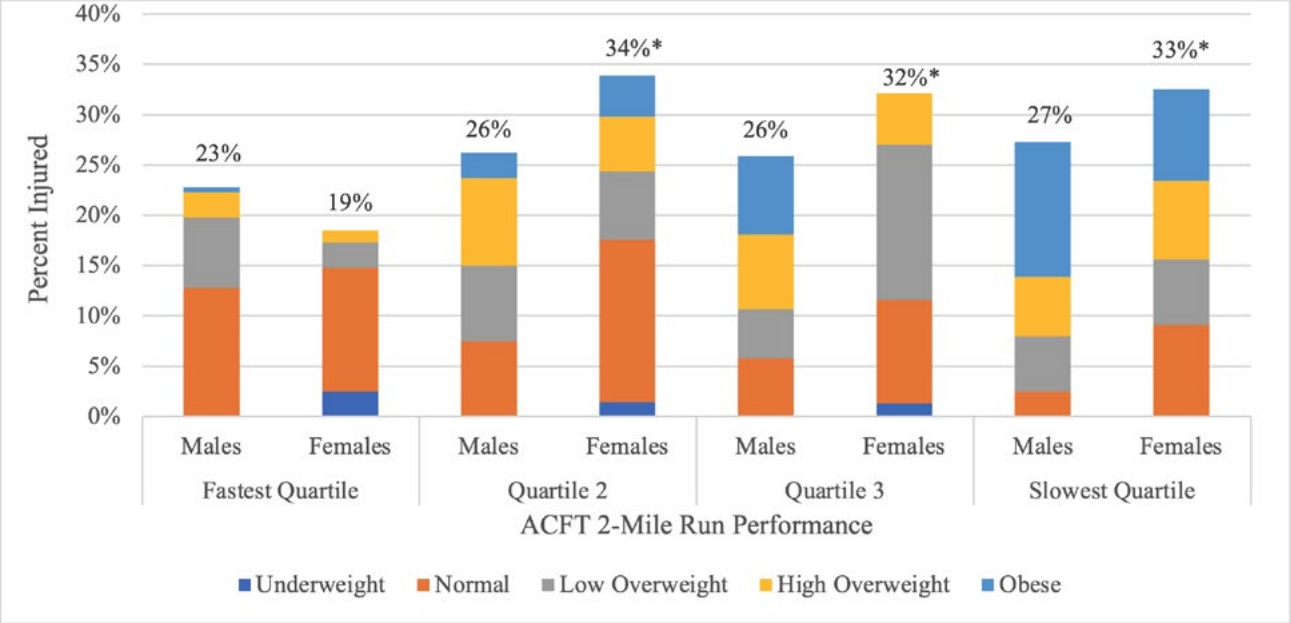
Normal BMI: n=477 males, n=263 females

Low overweight BMI: n=400 males, n=153 females

High overweight BMI: n=289 males, n=61 females

Obese BMI: n=366 males, 92 females

Figure 3. Percent Injured by ACFT 2-mile Run Performance, with BMI distribution



*Indicates that the proportion of Reservists reporting at least one injury is higher than the proportion injured among those with the fastest ACFT 2-mile run performance ($p<0.05$).

Fastest quartile: n=242 males ≤15.8 minutes, n=81 females ≤18.5 minutes

Quartile 2: n=239 males 15.9-17.7 minutes, n=74 females 18.6-20 minutes

Quartile 3: n=243 males 17.8-19.5 minutes, n=78 females 20.1-21.6 minutes

Slowest quartile: n=238 males >19.5 minutes, n=77 females >21.6 minutes

Results

There were 2095 survey respondents who provided sufficient responses for sex, height, weight and recent injuries. Most survey respondents were men, white, enlisted, and single (Table 1). The average age was 30 ±10 years old. A diverse distribution of military occupational specialties was represented, with the most common specialties being military police (21%), medical (21%) and engineering (19%).

Over one-quarter of respondents (30%, n=626) reported experiencing at least one injury in the previous 12 months. Respondents provided information for a total of 858 injuries (589 among male respondents (69%), 269 among female respondents (31%)). The five most frequently reported injured body regions, injury types and injury activities are summarised in Table 2 by sex. The leading reported injury type for both sexes was strained muscle, followed by sprained joints for men and overuse muscle pain for women. The most frequently injured body parts for both sexes were the lower back and shoulders. Activities frequently associated with injuries included running, weightlifting and lifting heavy objects. Overall injury prevalence was 28% and 35% for males and females reporting at least one injury, respectively.

Table 3 shows event performance and pass rates for respondents' most recent ACFT. Over half of respondents (52%, n=1094) reported participating in an ACFT and provided complete data for all six events. Compared to female respondents, male respondents had higher pass rates for all events ($p=<0.001$-0.06), except hand-release push-ups for which both sexes had the same pass rate. The sprint-drag-carry, 2-mile run and leg tuck/plank events had the lowest pass rates for both sexes. More male respondents reported performance consistent with overall passing scores than female respondents ($p<0.001$).

The average BMI was 27 ± 4 kg/m^2 among male respondents and 26 ± 4 kg/m^2 among female respondents. BMI distributions for both sexes are shown in Figure 1. A higher proportion of female respondents were in the normal BMI range compared to male respondents ($p<0.001$, Figure 1). In contrast, higher proportions of male respondents had BMIs classified as overweight and obese compared to female respondents ($p<0.001$, Figure 1).

When considering the impacts of BMI on injuries in this population, both male and female respondents with higher BMIs had higher injury prevalence

(Figure 2). On average, male respondents with BMIs classified as high overweight or obese had a higher injury prevalence compared to male respondents with normal BMI (p=0.006 and p<0.001, respectively). Similarly, female respondents with BMIs classified as obese reported a higher injury prevalence compared to female respondents with normal BMI (p<0.001).

Sixty-one percent of respondents (n=1272) reported completing an ACFT 2-mile run event in the previous 12 months. Female respondents who reported the fastest 25% (quartile (Q)) run times had a lower proportion of reporting injuries compared to slower female runners (Q1 vs Q2 p=0.30, Q1 vs Q3 p=0.049, Q1 vs Q4 p=0.04; Figure 3). A similar trend was noted for male respondents, but differences were not statistically significant (Q1 vs Q2 p=0.36, Q1 vs Q3 p=0.41, Q1 vs Q4 p=0.25). For both sexes, a significantly higher proportion of injured Reservists in the slowest run quartile were obese (p<0.05) compared to other run quartiles.

Discussion

This study is one of the first to report demographic, injury, fitness and BMI data among US Army Reserve personnel, a unique and understudied military population. Population demographics indicated a higher proportion of females and an older average age than in AD Army.[15] Demographics in this subpopulation were similar to those reported in a 2022 USARC report summarising the full Reserve population.[25]

The most frequently reported injured body regions and injury types in this Reserve population were similar to those typically observed among full-time AD Service Members.[26] Reservists predominantly reported injury types consistent with cumulative musculoskeletal overuse injuries, which is also the most common category of injuries among AD personnel.[15,26] Activities associated with Reservists' injuries were primarily related to physical training and occupational exposures, which are similar to injury activities often reported in AD military populations.[16,26] The 30% injury prevalence in this population, however, was lower than what has been observed in analyses of Army AD medical records,[15] and lower than self-reported injury prevalence in many previous studies of AD populations.[27,28] This may be expected because Reservists, given their part-time status, may perform less physical training and could therefore experience fewer training-related injuries.[4,8] Studies of AD and Reserve populations in other countries have also observed similarly lower injury rates for Reservists compared to AD.[10,11] Women had a higher prevalence of injuries in this population (35% injured) compared to men (28%), which reflects a similar trend observed among US Army AD Soldiers,[15] and also in another study among Reservists.[4]

Reserve personnel in this population reported lower ACFT event performance than has previously been reported for AD Army Soldiers.[15] Previous studies have also shown that Reservists experience more fitness test failures compared to AD.[4,8] These differences suggest that the Reserve health and fitness program should focus on improving physical fitness.

About one-quarter (24%) of males and 16% of female Reservists in this population reported height and weight consistent with a BMI classified as obese, which is higher than the reported obesity prevalence for AD service members[15] but lower than the obesity rate among US adults.[29] Another previous study similarly observed that a sample of US National Guard and Reserve members had higher obesity rates than AD military.[30] A BMI classified as obese has been associated with lower performance on the US Army Physical Fitness Test.[31]

The associations between injuries, physical fitness and BMI have seldom been explored for US Army Reserve members. This analysis showed that the prevalence of injuries for both sexes was higher with higher BMI or slower 2-mile run performance, which is consistent with relationships previously observed among AD Army Service Members.[17]

Reservists are expected to meet the same fitness standards as AD Service Members[2] but with much less oversight of physical training. Therefore, it has been suggested that additional fitness programs may be needed to encourage more effective physical training among Reservists.[9,32] One proposed suggestion for Reservists is a mixed training approach with three 50-60-minute weekly exercise sessions that combine aerobic, anaerobic, muscle strengthening and occupation-specific tasks.[32] Another recommendation is to encourage small group training with other Reserve personnel when possible, to build a similar community training focus as AD personnel.[9,32] Regulation and enforcement from leadership would be necessary if specific training activities were required.

Increasing physical training among Reservists may be challenging because exercise is primarily conducted during personal time and using personal resources. Despite this, a previous study found that Reservists reported existing levels of physical training that, on average, exceed national exercise

recommendations.[7] However, another study observed that AD Service Members participated in more high-intensity interval, resistance and vigorous physical training than Reservists.[8] Therefore, to improve strength and power, Reserve personnel should perform physical training that includes vigorous cardiorespiratory activities (e.g., running, sprints, high-intensity interval training, etc.) and at least two days a week of muscle-strengthening exercises. Ensuring access to physical fitness instructors can help Reservists train specifically for US Army duties. These physical training adjustments may enable Reservists train in a similar manner to their AD counterparts. However, mental and physical demands resulting from civilian occupations should also be considered when planning individual fitness programs for Reservists, in addition to their military service and training requirements.

Strengths and limitations

This is one of the first known investigations of demographics, physical fitness, injuries and BMI among US Army Reserve members. However, there are some limitations to note. The study population was a subset of Reservists from the Southeast region of the US; data may not represent all Reservists, and future work should analyse outcomes in a broader sample of Reservists if possible. Also, the calculated BMI outcome cannot differentiate between lean body mass and fat mass; however, previous studies have found BMI to have moderate to strong correlations with body fat percentage (0.65–0.95), including among military personnel.[33,34] Finally, although self-reported survey data may be subject to recall bias, previous analyses have shown that military survey respondents accurately report their injury, height, weight and fitness test performance information.[35,36] However, a previous study found that when military members were asked to recall past injuries, recall decreased as time passed,[35] so injuries reported in this population may have been underestimated.

Conclusion

This work provides important information about health factors in an understudied military population. US Army Reservists reported similar injuries as those often experienced by their AD counterparts, predominantly overuse lower extremity injuries resulting from physical training. About one-quarter of males (24%) and 16% of females reported having a BMI classified as obese, and a significantly greater proportion of those with higher BMIs reported at least one injury. Female respondents with the fastest ACFT 2-mile run times had the lowest proportion of reporting at least one injury compared to slower female respondents. Given these observed relationships between injuries, BMI and aerobic fitness, health and fitness programs for US Army Reservists should emphasise maintenance of healthy weight status and appropriate physical training for US Army duties.

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Needed Evolution in Afloat Teleradiology and Imaging Capabilities

M Ng, S Beall, D Becerra

Introduction

The concept of telemedicine dates back nearly 120 years, when William Einthoven won the Nobel Prize for transmitting the first EKG via telephone over 1.5 km.[1] Teleradiology has since evolved to allow specialists to review medical imaging remotely, facilitating faster and higher-quality patient care.[2] While ordering physicians can provide preliminary reads, the American College of Radiology recommends that all emergency department images be interpreted by a radiologist within 30–45 minutes, setting a gold standard that afloat care should strive to emulate.[3]

Plain film radiology has been available on amphibious naval vessels since the late 1980s. Over the past 35 years, advancements in afloat teleradiology have enabled medical teams to transmit images to shore for radiologist interpretation. These images guide patient management, influencing decisions on medical evacuation (MEDEVAC), duty status and treatment pathways. Teleradiology improves quality and efficiency, enhances time to treatment and refines treatment modalities, elevating care standards.[4] However, challenges remain in report turnaround time, radiologist availability, and imaging capabilities as we prepare for future Near Peer Adversary (NPA) conflicts.

Improved quality and efficiency of care at sea

Teleradiology is an essential yet underappreciated tool in the austere shipboard medical environment. It is often assumed that embarked medical providers can interpret radiographs without immediate radiologist support and that delayed reports will not significantly impact patient care. However, this assumption must be challenged as naval forces prepare for future conflicts.

Several studies have highlighted teleradiology's impact on care quality. Archbold et al. found that teleradiology improved musculoskeletal injury management in 35 of 46 referrals and altered treatment for eight patients, leading to cost-effective care[5]. In resource-limited settings, approximately two-thirds of teleradiology consultations improve quality, with nearly one-quarter leading to changes in management[2,6]. This underscores teleradiology's role in reducing misdiagnosis and preventing inappropriate treatment.

Beyond reducing misdiagnosis, teleradiology minimises unnecessary MEDEVACs. Stoloff et al. reported that telemedicine, including teleradiology, influenced MEDEVAC decisions in over one-third of cases.[2] Another study demonstrated a reduced incidence of missed bone fractures and unnecessary patient transfers.[7] Unwarranted MEDEVACs deplete personnel, increase risk through helicopter transport, and drive up costs from host-nation hospital fees. Expanding teleradiology services through military and civilian partnerships can mitigate these issues, with service costs offset by overall savings.

The most important aspect of austere military care relates to both combat and non-combat-related trauma. Trauma care in austere military settings relies on rapid decision-making with limited clinical information.[8] An immediately available radiologist can provide critical interpretations of chest and pelvic radiographs, potentially determining life-saving interventions when shipboard providers have limited trauma imaging experience.

Logistic considerations

Teleradiology's rapid expansion in the private sector over the past three decades has been driven by the need for after-hours coverage of urgent studies.[4] These services have reduced report turnaround times by up to 60% and decreased patient transport costs.[9,10] Additionally, teleradiology addresses the growing shortage of radiologists in austere and military settings.[11]

One key advantage of expanded teleradiology at sea is improved patient care, reducing unnecessary MEDEVACs and ensuring personnel remain mission-capable.[2] Teleradiology also allows images to be transmitted ahead of a patient's evacuation, enhancing medical decision-making at the receiving facility.[8]

However, challenges to include civilian teleradiology centres exist. Licensing requirements dictate that teleradiologists be licensed in both the state of care and image evaluation, complicating matters for shipboard patients at sea.[4] While this is not currently an issue with Department of Defense (DoD) radiologists, expanding services to private providers will require careful licensing agreements. Contracting with non-DoD entities will also necessitate considerations such as volume-based compensation models with bonuses and penalties as quality assurance measures.[4]

Afloat teleradiology experience

We retrospectively reviewed the radiology report turnaround times on the USS Wasp between 15 February and 14 October 2024, which revealed significant delays. Of the 8-month review period, 6 months were spent deployed at sea, while 2 months were spent pier-side in the United States US. Data were collected from the ship's radiology log and MedWeb software (Burlingame, CA), measuring read times from image upload to report receipt.

The average read time was 7.6 days ± 0.6 days, increasing to 7.8 days ± 0.6 days during deployment. The standard deviation of approximately 12 days highlights the unpredictability of report turnaround. While shore-based systems routinely provide reads within 24 hours, shipboard delays represent a clear quality-of-care issue. Real-time diagnostic imaging access is crucial, particularly in operational environments where decisions must be made rapidly.

Walter Reed National Military Medical Center's (WRNMMC) Department of Radiology is solely responsible for processing all US Navy shipboard radiologic exams. Given the fleet's size, this creates a substantial workload. While a dedicated staff radiologist provides daily reports, no overnight coverage exists for consultation or official reports. This absence of 24/7 radiologist availability significantly limits capabilities. In future naval conflicts, where combat may occur at any hour, immediate radiologist consultation—independent of time zones—will be critical for medical teams making urgent care decisions.

Our ship's medical department experienced the largest mass casualty event at sea since 2017. Plain film radiology was the most utilised diagnostic tool, particularly for orthopaedic injuries. This event occurred outside normal radiology staffing hours, leading to delayed assessments. While one missed clavicular fracture did not result in patient harm, immediate radiologist access could have expedited care. Additionally, a pneumothorax patient required daily chest X-rays for monitoring, but lengthy report turnaround times made timely assessment impractical. These cases illustrate the need for off-hours teleradiology services to support shipboard providers in real time.

Needed evolution: From improved consultation access to computed tomography afloat

Teleradiology is not a new technology, but its application in the US Navy has lagged behind civilian advancements. Fortunately, modern infrastructure can enhance shipboard radiology by reducing urgent image reporting times and improving communication between providers and radiologists.

The Navy should collaborate with private teleradiology firms to expand urgent image reading services. Relying solely on WRNMMC for fleet-wide radiologic interpretation places an excessive burden on a single department already tasked with supporting the largest tertiary military hospital in the world. Warships operate in remote maritime regions, often far from shore-based tertiary care centres. Given the unpredictable nature of shipboard medical care, access to civilian off-hours teleradiology services is essential for maintaining high-quality care.

Beyond expanded teleradiology, the most pressing need in shipboard radiology is the addition of computed tomography (CT) scanners on large-platform warships. CT imaging would enhance diagnostic accuracy, particularly for suspected appendicitis, traumatic brain injuries and cervical spine injuries.

Abdominal pain management in austere settings can also benefit significantly from CT imaging. Rosen et al. found that pre- and post-CT diagnoses matched in only 37% of cases, emphasising the value of CT in reducing diagnostic uncertainty.[12] When evaluating suspected appendicitis, CT imaging correlates with lower morbidity rates, regardless of final diagnosis.[13] Limited shipboard resources often lead to precautionary MEDEVACs, increasing costs and personnel losses.

In trauma settings, CT is now the gold standard for cervical spine evaluation, with plain radiographs offering an alarmingly low sensitivity of 45–60%.[14] In future conflicts, warships will serve as casualty receiving centres, where CT will be crucial for triaging and managing trauma patients.

Expanded teleradiology services would mitigate concerns about afloat providers interpreting CT scans without radiologist support. Adding CT

capabilities would improve adherence to trauma guidelines, reduce unnecessary MEDEVACs and provide long-term cost savings.

Conclusion

Teleradiology is a crucial but underutilised tool for enhancing quality and efficiency in shipboard medical care. Warship-based providers would benefit from improved access to timely radiology consultations, allowing real-time decision making that could significantly impact patient outcomes. Beyond improved consultation efficiency, advancing shipboard imaging capabilities—mainly through the addition of CT—should be a priority in modernising naval medical departments.

CT could improve care quality, reduce diagnostic uncertainty and decrease the need for urgent MEDEVACs, ultimately lowering costs and increasing mission readiness. The Navy must continue to refine and expand its teleradiology services and shipboard imaging capabilities to provide the highest standard of care in future maritime conflicts.

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Importance of the Spleen to Survival from *P falciparum*

G D Shanks

Abstract

P falciparum infections carry a considerable mortality risk, but the nature of the 'immunity' gained from infection experience is uncertain. Although anaemia may contribute some protection against mortality, the function of the spleen appears critical to controlling *P falciparum* parasitemia and increasing survival. Melanesian reports suggest that survival advantages of *P vivax* infections and genetic polymorphisms, such as alpha-thalassemia, are expressed through enhanced splenic function. Overwhelming infections in post-splenectomy patients further indicate non-specific splenic immunity. The co-evolution of *P falciparum, P vivax* and *Homo sapiens* has likely devised a rough balance between parasite growth and host survival.

> *While the army of defence is recruited from connective tissue in every part of the body, the spleen seems to have a special function to perform which cannot be assumed by the liver or any other depot of the reticulo-endothelial system.*
>
> L W Hackett 1937[1]

In the Southwest Pacific during World War II, the mortality rate for *P falciparum* malaria in soldiers was usually <1:1000, except in units cut off from medical supplies.[2] 'Australian soldiers retreating from Rabaul, New Britain died at high rates (20%) when their quinine ran out in 1942.[3] Japanese soldiers from the non-endemic island of Nauru fared particularly poorly (26% mortality) after hostilities ceased in 1945 when mixed with their comrades who had survived the war on the highly malarious island of Bougainville.[3] This was despite being treated with quinine by experienced medical officers (see Figure 1). Extraordinary mortality from *P falciparum* appears to be limited primarily to first infections, but there is little understanding of the nature of subsequent tolerance or immunity. Comparison of modern West African and Melanesian populations indicate that mortality in Melanesia is much less than under similar exposures in Africa.[4] Extensive epidemiology studies of malaria in African children still yield highly variable mortality information.[5] Despite significant advances in immunisation against malaria, it is challenging to demonstrate mortality differences directly due to malaria vaccines.[6] Some mortality differences appear to be due to non-specific immune actions.[7] The original indicator of malaria immunity was splenomegaly. Non-specific protection provided by spleen moderating *P falciparum* parasitemia may explain some of these disconnections between historical experience and epidemiological data.

Figure 1. Surrendered Japanese soldiers repatriated from Nauru to the Solomon Islands, where they first encountered malaria in October 1945. Nearly universal infection with *P falciparum* led to more than a quarter dying from malaria within five weeks despite treatment with quinine by experienced medical officers.[2] Australian War Memorial photo P00001.249, now in the public domain.

Classical studies of malaria spleens in the early 20th century indicated two types of splenomegaly.[1] Soft spleens turgid with blood were acute, transitory and usually found in early age groups with few infections. Hard spleens were caused by more chronic infections and mobilisation of phagocytes indicative of immunity. Spleen surveys were done on school children to give some direct indication of malaria infection rates in a geographic area recently. Epidemic malaria with *P falciparum* was marked by high mortality rates occurring in a non-immune population and was associated with low rates of splenomegaly. Thus, the presumed association of

splenomegaly, relative malaria immunity and low mortality.[1]

One key difference between West African and Melanesian malaria is the presence of *P vivax* in Asia. However, doubts about the limitations of *P vivax* prevalence in Africa have been recently expressed.[4,8] The two plasmodium species have co-evolved in Asia, with a third of falciparum infections triggering vivax relapses despite the rarity of simultaneous mosquito infections.[9] Soldiers with chronic vivax infections during World War II developed splenomegaly, although this was suppressed by continuous chemoprophylaxis with mepacrine.[10,11] An enlarged spleen caused by *P vivax* may clear subsequent parasitemias better than one without such experience, as was suggested by studies using heated autologous blood to track the removal of stiff erythrocytes from falciparum malaria patients treated with quinine in hospital.[12] *P falciparum* patients with splenomegaly cleared heated erythrocytes much faster than those without pre-existing splenomegaly, implying a survival benefit from splenomegaly leading to lower peak parasitemias. Malaria patients without splenomegaly did not clear parasites quickly until quinine was given, implying that a shift in splenic function only occurred after the addition of chemotherapy. Co-evolution means a balance of competing interests to maximise transmission of both parasite species and host survival. Splenomegaly induced by early *P vivax* infection protecting against lethal *P falciparum* would be one possible means to achieve such a mutually advantageous outcome.

That such co-evolution has occurred in Melanesia was suggested by epidemiology studies in children from Vanuatu.[13,14] The genetic polymorphism alpha-thalassemia produces disordered haemoglobin chains, mild anaemia and splenomegaly. Splenomegaly is more common in homozygous alpha-thalassemia (Relative Risk RR 1.5) and heterozygous alpha-thalassemia (RR 1.2) than controls, as is clinical malaria but not actual parasitemia. The Darwinian selection of alpha-thalassemia strongly indicates a survival advantage possibly generated by early *P vivax* infections protecting against mortality from later *P falciparum*.[4,13,14] Increased filtration of parasitised erythrocytes by the spleen is a plausible mechanism suggesting an evolutionary mechanism justifying earlier infection with a more chronic parasite. Multiple other haemoglobin polymorphisms appear to have been selected in malarious areas such as Southeast Asian Ovalocytosis (SAO), which was shown to protect against cerebral malaria in Papua New Guinea, but the smaller SAO series did not show distinct splenic differences.[15] Additional New Guinea studies showed SAO protection against *P vivax* infection indicates that polymorphism selection could be operating by multiple mechanisms.[16]

Studies from severe malaria in African children are also suggestive that the spleen has a critical role in survival after *P falciparum* infection. In a study of 104 African children with severe malaria, the spleen size (as measured by sonography and standardised by body surface area) in those dying was found to be comparable to community controls and significantly smaller (roughly half) than those who survived severe malaria.[17] The suggestion was that those with larger spleens were more capable of arresting the course of parasitemia, but it was uncertain what this meant regarding previously acquired immunity. Spleen size in severe malaria patients due to severe malaria anaemia was larger than those with cerebral malaria indicating the sequestration of large numbers of erythrocytes in the spleen.[17] In an extensive study from urban Mali, clinically measured splenomegaly was associated with improved survival in children with severe malaria.[18]

That the spleen is important to survival during *P falciparum* infection is most dramatically demonstrated in infections in splenectomised patients.[19] Although the four patients reported from Thailand were all successfully treated with standard chemotherapy, pigmented schizonts in the peripheral blood indicated the lack of normal splenic function of removing such parasites. Further studies from Thailand show that asplenic patients do not clear dead parasites from their circulation, emphasising the spleen's importance in parasite removal.[20] Sickle cell disease (SCD) is a special case similar to surgical splenectomy, as nearly all SCD children become functionally asplenic from repeated splenic infarcts. Epidemiological studies indicate that although SCD does not increase the incidence of malaria, SCD children hospitalised with malaria in East Africa are much more likely to die than those without SCD.[21] The relationship of the spleen to *P falciparum* infection is complex and modified by other immune factors. In a retrospective severe malaria study from Thailand, splenomegaly was roughly twice as common in cerebral malaria patients as those without complicated malaria but still had a high parasite biomass.[22] A previous clinical trial in African children with cerebral malaria showed the opposite finding that those with enlarged spleens cleared *P falciparum* faster, resolved coma quicker and survived at higher rates (each 1 cm increase in spleen size resulted in a decreased mortality ratio of 0.8; CI 0.7-1.0).[23] Bigger, however, is not always better, as in the case of hyperreactive malarial splenomegaly syndrome (HMS).[24] This obscure syndrome likely is generated by chronic malaria antigenic stimulation and carries

a considerable mortality risk, with more than one-third dying of all causes over three years. Splenic function is important, and the size of the spleen is only an indirect and imperfect indicator of the spleen's ability to perform its protective functions.

Is anaemia an indirect measurement of increased splenic activity during malaria infection? Moderate anaemia, often seen with iron deficiency, is common with either splenomegaly or malaria infection. Interestingly, moderate anaemia is one of the few protective factors discovered during a large meta-analysis of severe malaria specifically concerning mortality.[25] Although the mechanism of such protection (Odds Ratio 0.87, CI 0.80-95) is unknown, it is at least possible that moderate anaemia is a marker for increased splenic activity and, as such, may reflect malaria parasites being more effectively removed from circulation. Survival during falciparum infection could, therefore, be a function of decreased peak parasitemia.

Mortality during *P falciparum* infection is a complex interplay of multiple factors, but non-specific protection from the spleen is part of the equation. Increasing splenic activity by various mechanisms may incrementally contribute to host survival. The Darwinian selection of a variety of hemoglobinopathies (Sickle Cell, SAO, alpha-thalassemia) by malaria may be partially explained by the removal of stiffened erythrocytes by the spleen, creating a less permissive environment for *P falciparum*. *P vivax* may contribute to survival by enabling enlarged spleens to better handle *P falciparum*. Rather than specific immunity to certain antigens, the picture resembles a composite of non-specific cellular immunity centred on the spleen, incrementally increasing survival. How might such a mechanism be tested? Mortality studies are inherently challenging, requiring large populations and sound medical surveillance systems that may indirectly lower mortality simply by increasing access to medical care and transportation. However, more efforts to determine what factors genuinely determine malaria mortality are vital, otherwise, costly public health programs may end up expending scarce resources on programs unlikely to influence the most important survival endpoint.[6]

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Blending Power with Force: The Power of Mindfulness and its relevance to the Australian Defence Force

J Leung, A Dhir, P Ramjee

Introduction

The Commander of the coalition forces in Iraq, US Army Major General Walter Piatt, had the job of walking the tightrope every minute of his role. On the one hand, there was the relentless pursuit of enemies, while on the other lay the delicate diplomacy with tribal leaders to restore peace. At his disposal, he had the use of extensive force using a trove of modern weaponry and streams of tech-generated data.

In his own words, Major General Piatt stated that his best decisions relied on a tool so ancient yet replete with power. He often began daily operations by breathing deliberately, slack-jawed, staring steadily at a palm tree. Some may describe the practice as mindfulness, while others might call it meditation.[1] Ultimately, this practice allowed him to become grounded in the moment by creating a deep sense of present-moment awareness.

Mindfulness is a time-honoured concept in many spiritual and religious traditions. Over the last 40 years, western psychology has started to recognise many benefits of mindfulness training, and it has become a tool used in resilience training as well as an effective intervention in a range of psychiatric disorders.[2] The simple definition relates to three aspects. First, mindfulness is a process of awareness, not thinking. It involves paying attention to experience 'in the moment' instead of being caught up with random, 'fleeting' thoughts. Second, it involves a particular aspect of openness and curiosity, even if the experience is unpleasant. Third, mindfulness involves flexibility of attention: the ability to consciously direct, broaden or focus attention on different aspects of experience.

In this article we attempt to delve further into the relevance and potential application of mindfulness for the Australian Defence Force (ADF).

Challenges for the evolving ADF

The words 'employability' and 'deployability' are familiar to anyone exposed to a military environment. These terms are used as surrogate markers to indicate an individual's readiness to function efficiently and effectively in the field and for the ADF, this is paramount. For an individual to succeed in the field, they require more than just rigorous technical and physical preparation; they also depend heavily on mental resilience.[3] As far as the physical preparedness of its members is concerned, the bar is already set high upon entry. The processes and assessments at intake have already separated the physically fit from the unfit. However, matters pertaining to mental health are subtle and create somewhat of a sticking point. It is a matter of ongoing and ever-increasing concern that members of the Defence Force are reporting significant mental health issues despite having such high standards of physical fitness. Depression, anxiety, attention-deficit/hyperactivity disorder, post-traumatic stress disorder (PTSD), drugs and alcohol dependence are just some of the more prevalent mental health challenges that face members of the ADF. However, the cause for most concern is the high rates of Veteran suicide and suicidality. According to the latest report by the Australian Institute of Health and Welfare, the rate of suicide was highest in ex-serving males who were 24% more likely to die by suicide than non-serving Australian males.[4]

Despite the ADF's best efforts and intentions, mental health and resilience remains an area of ongoing concern. A sound body is not fully competent without a sound mind; this is where mindfulness warrants greater attention.

In recent years, mindfulness-based interventions (MBIs) have experienced exponential growth in research development. There have been multiple systemic reviews and meta-analyses

that have demonstrated the benefits of MBIs as a complementary adjunctive intervention for veterans with PTSD and other psychiatric disorders.[5-7]

Mindfulness in the military setting

Mindfulness has been practised for centuries, derived from the Buddhist practice of *sati*.[8] The health benefits of mindfulness became more recognised in the late 1970s through work done by Jon Kabat Zin. He started this practice at the University of Massachusetts Medical Center to help patients with chronic pain that had been labelled as 'hopeless' by their treating specialists. Jon Kabat Zin firmly believed that patients had to be deliberately involved in their own healing. Subsequent studies have revealed significant health benefits in many fields for those practising mindfulness regularly.[9,10]

Several scientific studies have since been delivering high-quality outcomes suggesting consistent efficacy of this relatively 'benign' practice for physical health and the development of mental abilities such as better focus, better decision making and resilience. Specific to the military, a study published in the American Journal of Psychiatry highlighted the beneficial role played by mindfulness-based training in building resilience in the US Marines undertaken prior to deployment.[4] Johnson et al. demonstrated that marines who participated in 8 weeks of mindfulness-based mind fitness training showed enhanced interoceptive awareness and improved response to and recovery from stressful training.[11]

The strategic benefits derived from the practice of mindfulness are not limited to the scope of assisting small groups of elite soldiers to accomplish their mission, as was highlighted in a study by Fraher et al.[12] The authors describe the term 'mindfulness in action' as a skill that encapsulates 'comfort with uncertainty' and 'positive orientation towards failure', attributes that can benefit commanders and soldiers alike, in any situation. This ability to make better quality decisions considering situational concerns and priorities is a skill that can be developed. In a world full of distractions where our attention span has been gradually shrinking, many decisions we make are reactionary. They are reactions and not responses. Responses require thoughtful consideration and situational awareness, and this is where the role of mindfulness comes in. Anxiety, depression, PTSD and addictions are reactions in a broader sense and warrant a more integrated approach in their handling.

In addition, mindfulness has been shown to improve leadership, team building and communication effectiveness. Allowing military leaders to develop situational awareness, including understanding themselves, their emotions, their blind spots and their ability to be empathetic, enhances their ability to make more impactful and meaningful decisions. This also directly influences their ability to communicate effectively and build team morale. Arendt et al. showed a positive link between leaders who practised mindfulness and the wellbeing of their followers.[13]

The current consensus within the military is that mental resilience is a dynamic state comprised of different components that can change depending on the situation, context and individual, all of which can be cultivated through appropriate training.[14] Current models of mental resilience training focus on developing the core skills of emotional, cognitive and behavioural control, explicitly in a military and operationally relevant context right from the initial stages of a soldier's career. An empirical model was initially trialled in the British Army between 2014 and 2016 as a framework to develop a Mental Resilience Training syllabus. Seven basic psychological skills were taught to soldiers, including goal setting, dealing with negative thoughts, positive self-talk, emotional regulation, arousal reduction by understanding the physiology of anxiety and fear, pain tolerance by accepting and embracing pain, and mental rehearsal and positive imagery. Initial evaluations of this training were extremely positive, and it was subsequently rolled out across the entire British Army Recruitment and Training Division.[15]

Figure 1. Psychological model of mental resilience[15]

Delivering mindfulness to the ADF: challenges and possibilities

> *'It's not what you learn, It's the way you learn it that matters'*
>
> JR Rim

Defence organisations across the globe are giving serious consideration to incorporating mindfulness

for their members. Major General Piatt has reasonable grounds to believe that practising mindfulness helps develop new ways of readiness for the forces. He referred to this training as doing 'mental push-ups' for developing the resilience 'muscle'.[1] Multiple studies have examined the impact of mindfulness training in managing prolonged and repetitive stress during deployment, showing that even short periods of mindfulness training can reduce performance lapses and enhance a soldier's ability to manage stress.[16,17] Mindfulness can be taught relatively quickly, with allocations made for self-practice and refreshers. COVID-19 has unveiled the possibility of learning such skills in a hybrid fashion, either face-to-face or online.

It is acknowledged that the ADF has been receptive to mindfulness-based training. The Royal Australian Airforce (RAAF) have trialled corporate-based mindfulness training as part of resilience training, and HQ Forces Command has commenced a weekly lunchtime mindfulness drop-in session. Australia's Special Operations Command have also incorporated a mindfulness module in their Human Performance Optimisation Program as has the Royal Australian Navy through its Navy People Wellbeing Program.[3] The feedback has been reassuring, setting the stage for a wider application of this tool. Ultimately, delivering mindfulness training to the broader defence force organisation in a structured and measured manner would allow all members to benefit from enhanced interpersonal integration and collaboration.

The views expressed herein are the views of the authors only and not those of the ADF or The Australian Army.

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Chronic Pain in Veterans - A Way Forward

S Menon, F Davies, A Colwell, J Firman

Abstract

Chronic pain is three times more prevalent in veterans than in the non-veteran population, with a link to trauma and mental health conditions. At the 45th International Committee of Military Medicine (ICMM) World Congress, the Department of Veterans' Affairs (DVA) hosted a pre-congress workshop to address the barriers that both veterans and healthcare providers face in managing chronic and persistent pain. This commentary aims to summarise the learnings from the pre-congress workshop and discuss further strategies to support providers and veterans in accessing best-practice care.

Introduction

Chronic pain continues to be managed inadequately and remains a cause of increasing morbidity within the veteran population, with close to 90% of transitioned and regular ADF (Australian Defence Force) members reporting some degree of pain intensity and disability.[1] The pathways for providing care for chronic pain are complex, and the barriers are multifactorial. Chronic pain often presents with or is compounded by mental health conditions such as post-traumatic stress disorder, anxiety and depression in up to 85% of veterans.[2] The ICMM workshop aimed to consider the barriers that both veterans and healthcare providers face in accessing and providing high-quality care for chronic and persistent pain, and to identify actions that the DVA can take to support best-practice care in the Australian healthcare system.

Background

Despite the recent introduction of a national strategy for health practitioner pain management education,[3] it remains challenging to translate education into the effective real-world management of complex chronic pain. In the military subgroup in particular, a complex management issue remains for many healthcare providers. While a recent randomised controlled trial looking at long-term outcomes has shown that an interdisciplinary pain management program can produce significant and sustained improvements in pain-related disability in veterans compared to standard care,[4] these can be difficult to access.

In recent years, guidelines have reinforced an emphasis on non-opioid treatments as first-line for chronic pain.[5] While opioids are effective for short-term pain management, they are not recommended for long-term use due to the effects of tolerance, dependence, addiction and opioid induced hyperalgesia. Education and self-management techniques, such as relaxation, acupuncture, massage, nutrition and exercise, have been an important part of treatment. Encouraging patients to independently manage their symptoms by promoting their own self-efficacy through lifestyle changes has been shown to reduce healthcare costs and medication use.[6]

The impact of mental health conditions on the development and perpetuation of chronic pain is also of critical importance in veterans. The recently published Monash report reviewed the association between chronic pain and mental health and found 'consistent data suggesting an increased prevalence of chronic pain among ex-serving personnel and overlap of chronic pain with mild traumatic brain injury, post-traumatic stress disorder, depression and anxiety'.[7] DVA already provide veterans with access to fully funded treatment for all mental health conditions regardless of the link to service through Non-Liability Health Care (NLHC).

Workshop design

Session 1

The workshop was attended by 73 participants, providing DVA with an opportunity to gain insights and expertise from health providers worldwide. Session 1 welcomed a panel of expert speakers comprising a Pain Specialist, Specialist Pain Physiotherapist and a Psychiatrist to lead the discussion through a fictitious case study of a veteran's journey through chronic pain and coexisting mental health conditions.

Participants were able to respond to an interactive platform on personal devices.

Outcomes of Session 1

The understanding of the definition of chronic pain, also known as persistent pain, between health providers varied. However, there was a consensus around the International Association for the Study of Pain (IASP) definition of ' pain that persists or recurs for longer than 3 months and can last for several years' also noting their recently revised definition as either primary (main presenting problem) or secondary (due to an identifiable underlying cause).[8]

Chronic pain was acknowledged to require treatment in its own right and should go beyond direct treatment of the underlying condition. The complex interplay with the military compensation system, which addresses pain as a symptom, was noted. Additional biopsychosocial factors which can influence the perception of pain and treatment outcomes include a loss of identity, loss of camaraderie, financial stress and relationship pressures; treatment of chronic pain was deemed to incorporate all these factors.

The panel reiterated that a multidisciplinary evaluation, including a psychological assessment, was crucial, and participants agreed that a patient-centred approach should be adopted, encouraging the formation of a 'therapeutic alliance' and helping veterans accept mental health support early in the treatment plan. The panel discussed how other forms of psychological counselling, such as cognitive-behavioural therapy (CBT), should be utilised to 'cope with the emotional strain and break the cycle of pain amplification through stress and fear'.

Treatment should also focus on substance addiction, weaning of opioid use and augmentation with other pharmacological or non-pharmacological modalities of pain management, including psychotherapy, nerve blocks and neuromodulation. Physical rehabilitation with an emphasis on graded exposure to activity should be utilised to overcome fear-avoidant behaviours and movement-related anxiety.

A new concept introduced was 'clinical yarning', a culturally sensitive communication framework utilised in healthcare for Aboriginal and Torres Strait Islander Peoples, which employs a 'yarning' approach (an informal two-way exchange of information via storytelling) to engage with the patient's background and health concerns.[9] Workshop participants discussed how this could be easily adapted for use between healthcare clinicians and the veteran population to establish trust, improve communication and engagement of veterans with self-management plans.

Session 2

Participants engaged in round table discussions to generate insights around three main questions from a veteran, provider and mental health lens:

1: What are the barriers to accessing best-practice pain management?

2: What are the solutions to address these barriers?

3: How should DVA prioritise these solutions?

Outcomes of Session 2

The major barriers for veterans in accessing chronic pain management were noted to be awareness of programs/services in place, limited access in the community to non-pharmacological treatment modalities, and a perception that these treatment options are less effective. Financial limitations, inadequate social support and a lack of transportation can be added challenges, particularly for those living in rural or remote locations. Participants raised the issue of cultural norms within the defence force, treatment avoidance due to a perceived risk to one's career and the stigma attached to having a mental health diagnosis. Figure 1 below represents responses from participants and highlights the complexity of the issue.

For providers, a major barrier faced is the limited understanding of DVA processes and knowledge of support services. Health workforce shortages have impacted the availability of multidisciplinary facilities and care coordinators. The biggest challenge faced in the Australian population is providing integrated multimodal care across broad geographical regions with differing demographics, as well as the funding and resources required to develop and maintain such programs.

Solutions suggested by participants centred around the following themes:

- Access and availability of multidisciplinary team (MDT) care
- Funding
- Veteran education
    - Promotion of health literacy programs and support services
    - Utilisation of avenues such as ex-service organisations and veteran-specific peer-support groups

Figure 1. Barriers for veterans in accessing pain management – participant responses

- Provider training
  - Access to evidence-based programs for GPs specific to veterans' health
- Promote early intervention
  - Triage and care co-ordination
  - Transition support for veterans with chronic pain
  - Engage community support services
- Improvements in DVA administrative burden
  - Streamlined, simplified processes
  - Appropriate remuneration and invoice processing

The consensus among participants was that DVA's focus should be on improving healthcare access and providing education on available support services for veterans. The launch of the Veterans Healthcare eLearning Platform 'VetsHelp', a DVA-initiated support service in collaboration with Medcast®, was very well received. Education for GPs to improve their understanding of the interplay between chronic pain and mental health issues in veterans, as well as increased support during transition, could assist in veteran engagement. DVA should also prioritise improvements in administrative workload for veterans and providers.

Conclusion

The ICMM workshop commentary emphasised the importance of a holistic approach to the management of chronic pain and the importance of addressing mental health and other co-morbidities in the veteran population. There was general agreement on what constitutes best-practice care, with the priority being the early identification of at-risk individuals, a patient-centred approach to care and the involvement of a multidisciplinary team. Unfortunately, significant barriers to optimal care still exist. While acknowledging funding limitations, solutions focused on the need for education of both veterans and healthcare providers as a key step in ensuring that the proper care is accessed. Participants suggested that DVA could further support these initiatives by improving the funding and administrative framework to better support optional models of care.

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A Cure for Phantom Limb Pain?

Dr Kylie Hall

A new surgical management of the nerves now prevents neuroma formation and prevents severe pain PLP.

Phantom limb pain (PLP) arises from the absence of distal neural connections at the severed nerve, representing a form of neural "rewiring" after amputation. Nearly everyone who undergoes amputation will experience PLP, and for most, the pain is severe. While various strategies have been attempted to ease its intensity, success has generally been limited. The pain typically persists for several months—sometimes longer—and may recur, especially during periods of stress.

When a nerve is transected, neuroma formation is a natural part of the healing process. Unfortunately, these neuromas often become painful, making it difficult for individuals to wear prostheses and limiting their activities due to discomfort or fear of pain.

Encouragingly, a new surgical approach to nerve management now offers the promise of preventing neuroma formation and the development of severe PLP, representing a significant advance in post-amputation care. The surgery can be performed at the time of amputation, or many years after, with good results.

A Medical Perspective of the VETS Act: Changes, Challenges, and Chances

Dr Fletcher Davies[1]

1 Department of Veterans' Affairs, Melbourne, Australia

Biography:

Dr Fletcher Davies completed his medical degree at the University of Adelaide and spent the next 15 years working in acute hospital medical throughout South Australia and Victoria. After completing Masters Degrees in both Public Health and Healthcare Management, he joined the Department of Veterans' Affairs (DVA) in 2013.

While at DVA, he has contributed to the design of the current claims processing IT system, rationalisation of provider-facing paperwork, the development of a governance framework for clinical advisers, and the implementation of an assertive case management program for vulnerable veterans. He has been in the role of Principal Medical Adviser, Compensation since 2019.

The Veterans' Entitlements, Treatment, and Support (VETS) Act was passed in February 2025 and will be fully implemented on 1 July 2026. From this date, all new claims will be considered under an improved MRCA. The move to a single Act provides a chance to simplify and speed up claims processing. Significant changes include the introduction of provisional liability, coverage for all 'on-duty' injuries, simplified date of effect determination, expanded gold-card eligibility, and a streamlined review pathway. Challenges exist in managing 'grandfathered' and transitional arrangements, conversion of historic DRCA assessments, and optimising service periods for presumptive acceptance.

This presentation will discuss the impact of these changes on both veterans and their healthcare providers, and implementation strategies to manage the challenge of transition to a single Act. It will highlight the opportunities that these changes will create to reframe the Compensation process as one which better promotes recovery, good health, and overall wellbeing, rather than focussing on illness.

A Transferable Framework for Moral Injury: An Interdisciplinary Psychology and Chaplaincy Model from Emergency Services

Mr Jesse Winter[1]

1 Fire Rescue Victoria, Melbourne, Australia

Biography:

Jesse Winter is a Chaplain with Fire Rescue Victoria and a registered provisional psychologist. As an Emergency Services Foundation scholarship recipient (2024), he is researched how chaplaincy and psychology can address moral injury within emergency services. Jesse's post-graduate studies in theology and psychology and professional expertise in Chaplaincy & Mental health lays a foundation to his research and reports on interventions for populations experiencing potentially morally injurious events.

Background

While Moral Injury (MI) is commonly understood as occurring in military personnel and is often associated with discrete, high-stakes deployment events, this presentation argues that moral injury can occur beyond these settings, such as Public Health and Disaster responses. Significant and analogous challenges exist for Australian First Responders. Australian emergency services personnel face unique, career-long, and cumulative

exposure to Potentially Morally Injurious Events (PMIEs). Critically, MI in this cohort is not only incurred by operational events alone, but also by organisational betrayal, a critical issue of Human Factors, leading to a workplace moral injury which is often experienced through profound embitterment and externalising guilt. This context may provide a valuable understanding of moral injury sustained by military members, outside of PMIEs, during routine garrison duties, and can impact long-term Veterans' health and wellbeing.

Approach
This presentation introduces an enhanced framework for understanding moral injury, positing that injury occurs not just from exposure to a Potentially Morally Injurious Event (PMIE), but from a failure to psychologically and spiritually integrate the event into one's existing moral schema—a process heavily influenced by an individual's spiritual and moral maturity. Left unaddressed, this can lead to "Moral Drift": an insidious erosion of character where the injured individual's ideals shrink and they even perpetuate moral injury. The consequences directly impact operational effectiveness by compromising team cohesion, impairing integrity, morals, ethical decision-making, and increasing psycho-social risks to health and safety.

The presentation will explore key clinical considerations, including the challenge of addressing the inappropriate yet intractable guilt that can manifest in both internalising and externalising presentations. Ultimately, it argues that fostering an individual's spiritual health is foundational to developing the moral maturity required for moral resilience. This serves as a powerful mechanism for both preventing moral injury and as intervention supporting recovery. This is achieved through a psycho-spiritual, values-developmental approach that, while aware of the cognitive impacts of trauma, offers a more holistic alternative to purely cognitive models often used in PTSD Treatment.

Model Components
The proposed model offers a human-centric, interdisciplinary approach that structurally integrates two professional disciplines, moving beyond physical health or skills training to provide truly holistic care.

- Psychological Support: Psychologists provide essential clinical governance, offering risk assessment for suicidality, diagnosis and treatment of co-morbid conditions like PTSD, and evidence-based modalities for trauma processing.
- Chaplaincy Support: Chaplains address the vital bio-psycho-social-spiritual dimensions, facilitating meaning-making, fostering spiritual health and moral maturity and development for moral resilience, and guiding healing processes like forgiveness that are essential for resolving the inappropriate guilt and betrayal inherent to MI.

Interventions & Implications for Military
This framework translates into practical, tiered interventions, including adapting evidence-based group programs and establishing peer-led moral distress sessions. By addressing the multifaceted nature of MI, this model offers a transferable strategy that transcends conventional boundaries. It provides a robust framework for fostering career-long moral resilience, supporting overall medical fitness, preventing moral drift, and cultivating an ethical environment for all uniformed personnel who serve with moral integrity.

Accelerated Healing: Preliminary Outcomes from a 4-Day Intensive Trauma Treatment Centre (ITTC) Program for Veterans Using EMDR 2.0 and Prolonged Imaginal Exposure

Dr Michelle Parker-tomlin[1,2], Dr Grant Blake[1]

1 Intensive Trauma Treatment Center, Brisbane, Australia,

2 Griffith University, Gold Coast, Australia

Biography:

Dr Michelle Parker-Tomlin is a Clinical Psychologist and Head of Clinical at the Intensive Trauma Treatment Centre, where she supports the development and delivery of a high-impact, intensive evidence-based trauma intervention program. With over a decade of clinical experience, she has worked across diverse settings including public hospitals, university, primary health networks, community mental health, private practice, and intensive treatment programs. Her work spans both frontline clinical delivery and clinical research, with a strong focus on innovative models of care.

As a military veteran herself, she brings a unique, lived understanding of service-related trauma to her practice. Her personal and professional experiences drive a deep passion for advancing accessible, effective, and compassionate care for all people affected by trauma. She has a particular interest in intensive therapies and their potential to reduce

barriers to care, increase treatment engagement, and accelerate recovery.

She is also a Clinical Supervisor and communication skills facilitator, affiliated with Griffith University, where she supervises Clinical Psychology interns enrolled in Master's and PhD courses and medical students. Her current clinical work focuses on implementing EMDR and Prolonged Imaginal Exposure within immersive treatment formats. She continues to contribute to clinical innovation, training, and research to improve trauma care.

Dr Grant Blake is a Clinical Psychologist and cofounder of the Intensive Trauma Treatment Centre (ITTC), where he serves as Clinical Director and lead therapist. Since 2018, he has delivered intensive trauma-focused treatments using various models, including EMDR-only protocols and blended approaches, tailored to individuals with complex trauma. He maintains a private practice on the Sunshine Coast (Qld) and provides independent medicolegal reports across criminal, family law, and personal injury matters—often involving trauma-related conditions and symptom validity assessment. He is an Accredited Medical Practitioner for WorkSafe Tasmania, evaluating psychiatric injuries and permanent impairment.

Dr Blake's research background spans fitness to stand trial, malingering detection, and violent extremism, and he currently holds adjunct research positions at Swinburne University's Centre for Forensic Behavioural Science and the Forensic Child and Youth Mental Health Service (Qld). He has served as an expert witness in multiple jurisdictions including the Federal Circuit Court and Supreme Courts of QLD and TAS. His core clinical and research interests include forensic assessment, PTSD, violence risk, and deception detection. He is lead author of the ANZ Evaluation of Fitness to Stand Trial – Revised.

Psychological trauma remains pervasive among military veterans, often resulting in chronic post-traumatic stress disorder (PTSD), depression, and anxiety. While traditional weekly psychological therapy formats can be effective, they are often prolonged and subject to logistical barriers such as accessibility, stigma, and dropout. To address these limitations, ITTC implemented an innovative, intensive 4-day trauma treatment program that integrates Prolonged Imaginary Exposure (PE) and Eye Movement Desensitization and Reprocessing (EMDR 2.0), offering a concentrated and therapeutically rich alternative for those desiring rapid intervention and symptom relief.

The intensive program consists of 16 alternating 90-minute therapy sessions conducted over four consecutive days, delivered in a structured, immersive format. PE emphasises detailed narrative engagement with trauma memories to ensure clients are adequately prepared for deeper processing work. This approach reduces avoidance behaviors and helps desensitise clients to distressing memories, which can significantly lower emotional reactivity. EMDR 2.0 builds on the classical EMDR protocol by incorporating optimised working memory taxation, flexible bilateral stimulation, and an adaptive pacing strategy to enhance desensitisation and memory processing efficiency.

To date, the ITTC intervention has been delivered to a pilot sample of veteran and non-veteran clients. While early clinical impressions are promising, showing noticeable significant reductions in PTSD and often comorbid mental health symptoms post-treatment, the small sample size limits definitive conclusions. To support interpretation of these early outcomes, we reference comparable data from the Psytrec model (Voorendonk et al., 2020), which similarly employed an intensive, multi-modal trauma therapy format over a condensed time frame. In their study involving 308 patients diagnosed with PTSD, Psytrec reported symptoms of both PTSD and CPTSD significantly decreased from pre- to post-treatment resulting in a significant loss of International Trauma Questionnaire (ITQ)-based PTSD and CPTSD diagnoses (85.0% and 87.7%, respectively). No adverse events occurred in terms of suicides, suicide attempts, or hospital admissions. These findings, and others like it, provide a meaningful benchmark for interpreting our preliminary data and reinforce the potential efficacy of intensive trauma treatment models.Participants in our pilot cohort reported high satisfaction with the format, particularly citing the value of immersive engagement, continuity of care, and the perceived acceleration of symptom relief. The dual-modality approach appears to capitalise on the strengths of both techniques: PE builds emotional tolerance to trauma memories. EMDR 2.0 facilitates rapid desensitisation and processing of trauma memories. Furthermore, for the ITTC, no adverse events or dropouts have been recorded, highlighting the feasibility and tolerability of the program, even among those with complex trauma histories.

This intervention model offers significant implications for healthcare systems, where timely, effective, and scalable mental health interventions are critically needed. Intensive therapy formats, once considered unorthodox, are increasingly supported by empirical evidence and offer an important avenue for reliable fast interventions, reducing waitlists, enhancing access, and improving engagement among hard-to-reach or 'treatment resistant' populations.

ITTC future research will expand these findings by evaluating the real-world effectiveness of intensive trauma therapy compared to traditional long-term psychological treatments for Veterans and non-veterans with PTSD. Using a prospective cohort study with long-term follow-up data of up to 24 months. Our early evidence suggests that a 4-day intensive model integrating EMDR 2.0 and PE is not only feasible but potentially transformative in treating trauma. Furthermore, no adverse events or dropouts were recorded, highlighting the feasibility and tolerability of the program, even among those with complex trauma histories.

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An Exploration of the Role of Military Advanced Practitioners and Their Potential Employability in the Deployed Pre-Hospital Environment: A Mixed-Methods Study

Dr Elizabeth Paxman[1]

1 RAAF, Australia

Biography:

Bio: Sqn Ldr Paxman ARRC PhD, MSc, BSc, Dip HE RN

Squadron Leader Elizabeth Paxman Nursing Officer specialising in Emergency (EM) and Pre-Hospital Care. She served 16 years in the UK Royal Air Force (RAF) before transferring to the Royal Australian Air Force (RAAF). Posted to 3 Aeromedical Evacuation Squadron.

After completing a Diploma in Adult Nursing, she worked in the NHS before commissioning into the Princess Mary's Royal Air Force Nursing Service, graduating from RAF Cranwell in 2008. During her RAF career, she undertook multiple operational deployments, including with the Medical Emergency Response Team (MERT) in Afghanistan and the British Army Training Unit Kenya.

Between deployments, she completed an MSc in Advanced Practice, qualifying as an Advanced Clinical Practitioner, and was the RAF Specialist Nurse Advisor for Advanced Practice and Defence Pre-Hospital Nursing. She completed her PhD at the University of Southampton, which focused on the role and employability of Advanced Practitioners in deployed military healthcare.

Introduction

International research and clinical experience suggest that the Advanced Practitioner (AP) role could significantly benefit Defence by enhancing the delivery of pre-hospital emergency care (PHEC) in operational environments. Defence forces worldwide have trained a small number of APs, yet there remains a lack of research defining their operational role and their specific contribution to deployed pre-hospital care. This study, based on UK PhD research, explores the potential role of military APs and their employability in deployed PHEC settings, with findings applicable to Defence healthcare systems, including Australia's Defence Force.

Methods & Results

This research employed a two-phase, mixed-methods approach to determine the necessary skills for APs in deployed PHEC roles. The first phase used a Delphi study to identify essential clinical skills. Findings indicated that APs should be proficient in sedation, independent blood administration, ultrasound, and advanced airway management. However, consensus was not reached on all procedures, with intubation and chest drain insertion remaining contested.

The second phase utilised qualitative methods to examine the experiences of military APs and the perceptions of healthcare professionals working alongside them. Three major themes emerged:

1. Current Experiences & Training – Participants reported variability in training pathways and a lack of formalised career progression for military APs.
2. Support & Working Relationships – Trust, role clarity, and professional hierarchies influenced APs' integration within multi-professional teams. The absence of a structured employment strategy created uncertainty in working relationships.
3. Future Role & Employability – Participants universally recognised the potential value of military APs but identified challenges regarding role definition, governance, and operational integration.

Conclusion

Both existing literature and civilian healthcare experience demonstrate that AP roles offer valuable

opportunities in emergency and operational settings. Within Defence, APs could enhance PHEC and retrieval capabilities by bridging the skills gap between paramedics, nurses, and PHEC doctors. While the AP role in military operations remains undefined, findings suggest that formalising their employment strategy could improve workforce capability, patient care, and career progression for military healthcare professionals. The insights from this research provide a foundation for Defence forces, including Australia's, to consider the strategic integration of APs into deployed healthcare models.

An Update on Drone Warfare & Ukraine – Rapidly Evolving Challenges in Military Medicine

GPCAPT Jeff Stephenson[1]

1 Royal Australian Air Force, RAAF Richmond, Australia

Biography:

GPCAPT Stephenson has thirty-eight years' experience working within Defence Health.

He has deployed to East Timor, Banda Aceh Sumatra and the Middle East. He has performed aeromedical evacuations from most countries in our Pacific arc, including Bali, as well as from the Middle East and Europe.

He was awarded an Order of Australian in 2008 for Meritorious Service in the fields of Operational and Garrison Health.

He is currently the:

- *Chair of the ADF Medical Officer Professional & Continuing Development Committee;*
- *The Clinical Director of Primary Health Care for Air Force Health Reserves;*
- *A Regional Senior Aviation Medical Officer for the Institute of Aviation Medicine; and,*
- *The Senior Medical Advisor to RAAF Richmond.*

He is a graduate of the Australian War College Thinking Strategically course and an observer member of the NATO Interallied Confederation of Reserve Medical Officers.

GPCAPT Stephenson has a Master's degree in Aerospace Medicine, a diploma in Aeromedical Retrieval and Transport and is an inaugural Fellow of the College of Aerospace Medicine. He also has a medical degree from the University of Sydney.

GPCAPT Stephenson's current focus is on shaping Defence Health to align with the current geopolitical environment. He is vitally interested in the strategic and tactical implications of drone warfare.

Drone warfare has become the new philosophy of warfare. Drones, AI, machine learning and cybersecurity are exponentially changing the battlefield. New iterations of drone technology and counter measures are occurring on a two-monthly cycle. Kill zones now have a 50 km bandwidth, with drones the primary strike tool inflicting 70 per cent of personnel injuries and 75 per cent of equipment and vehicle damage. Perfidious warfare ensues, with maiming and disabling preferred over killing. Health personnel and evacuation systems are deliberately targeted, with Role 1 and 2 health facilities regularly overwhelmed.

At ICCM 2024, GPCAPT Stephenson spoke of Drones being "A Paradigm Change in Military Medicine". Much has changed in the last twelve months. The future is now here. This new philosophy of warfare must be assimilated into our tactics, techniques and procedures. GPCAPT Stephenson provides an update on the myriad lessons learnt from drone warfare and details the most contemporary clinical takeaways from the Ukraine conflict and how it impacts the Australian Defence Force.

Beyond Force Protection: Environmental Health and the Operational Advantage in Complex Battlespaces

Dr Andrew Mathieson[1]

1 Australian National University, Canberra, Australia

Biography:

Dr Andrew Mathieson is a highly experienced UK trained, Environmental Health Officer with over 40 years of service in civilian, academic, and operational contexts . He brings a unique dual perspective, having also served for more than 30 years in the UK Reserve Army, including multiple deployments and training missions in complex and high-risk environments. Andrew has dedicated his career to promoting the critical role of environmental health in maintaining operational capability, public health resilience, and mission success.

Throughout his career, Andrew has championed the importance of early intervention, prevention, and timely technical support in both military and civilian settings. His expertise spans water and sanitation safety, food hygiene, environmental protection, risk communication, and disaster preparedness. As a senior academic, he has mentored the next generation

of public health and defence health professionals, embedding field-based insights into environmental health education and training programs.

Andrew's work has taken him across diverse global settings, including support to civillian, UN and Defence missions in Africa, Asia, Pacific and the Middle East. His longstanding commitment to service, education, and evidence-based practice underlines his belief that environmental health is not only a support function—but a strategic asset in both peace and conflict.

Environmental health (EH) capabilities have long been understood as essential to force protection, reducing disease non-battle injuries (DNBI), and enabling sustained operations. However, in future high-intensity, multilateral missions—characterised by contested logistics, degraded infrastructure, and multinational coalitions—EH plays a more strategic and dynamic role. This presentation explores how environmental health provides operational advantage in complex battlespaces by enhancing interoperability, maintaining combat effectiveness, and supporting mission resilience across joint and coalition forces.

Modern military operations are increasingly taking place in congested, degraded, and austere environments, (consider the Indo-Pacific and other littoral zones) where climate, geography, and infrastructure pose severe health and operational risks. Environmental hazards—including contaminated water, inadequate waste disposal, vector-borne diseases, and industrial pollutants—can quickly degrade the health of deployed personnel if not rapidly assessed and mitigated. EH personnel are uniquely trained to provide early risk identification, rapid response, and scalable mitigation, which are critical in forward operating environments. Their contributions range from water testing and field sanitation to managing public health outbreaks and environmental intelligence gathering.

In multilateral operations, where interoperability is a decisive factor, EH professionals also function as enablers of harmonised standards, practices, and risk communication across allied forces. Shared environmental health protocols—such as water potability thresholds, vector control methods, and hygiene standards—are essential for integrated logistics, force sustainment, and trust across nations. When environmental health capabilities are embedded early in planning and operations, they facilitate a unified approach to health surveillance, reduce operational friction, and enable coalition partners to operate from shared infrastructure with confidence.

Moreover, EH plays a significant role in shaping the "information advantage" in operational theatres. Environmental data collection and analysis—such as air, water, and soil sampling—can provide early warning of threats not visible through conventional intelligence, particularly in grey zone or hybrid conflict scenarios. This data-driven capacity contributes not only to health protection but to situational awareness and strategic decision-making.

The paper draws on lessons from recent exercises and deployments, including multinational engagements in the Indo-Pacific, to highlight both the enablers and limitations of current EH force elements. It argues for the elevation of EH within the broader health and logistics planning cycle, investment in interoperable technologies and training, and the establishment of shared doctrine to align allied capabilities. Environmental health must be reframed not as a support function but as a critical enabler of readiness, resilience, and multinational cohesion in modern warfighting.

As global strategic competition intensifies and climate-driven instability increases the likelihood of complex humanitarian and kinetic missions, militaries that integrate environmental health as a core operational capability will be better positioned to project and sustain force across domains. Future battlefields will reward not only lethality and mobility but adaptability, integration, and survivability—domains where environmental health delivers tangible and enduring effect.

Beyond Insomnia: A New Era of Sleep Health Screening in the NZDF

FLTLT Amy Davis[1]

1 New Zealand Defence Force

Biography:

FLTLT Amy Davis (MSc) is a Registered Psychologist with the NZDF, currently serving in the Directorate of Psychology. She began her career in the intellectual disability sector, where her research examined attributional bias in employment barriers for people with intellectual disabilities. In 2020, she joined the RNZAF to apply her skills in a military setting.

Amy has contributed to a wide range of Defence research, including training design for EOD operators, the predictive validity of CBAT scores, the selection of mental skills inventories for coaching, and culturally authentic leadership for Māori personnel. One of her proudest contributions has been to research on gender equity in Defence, exploring the experiences of NZDF

women and the organisational impacts of mandated gender representation on senior boards.

She is passionate about applying psychology to real world military problems, especially those that fall through the cracks of traditional medical or performance models. Her current research and advisory work aims to equip Defence leaders with data driven strategies to build sustainable, high performing teams.

Amy has recently completed further study in sleep and circadian science for health practitioners and is currently upskilling in psychological medicine, with a focus on perinatal psychology, through the University of Otago.

The New Zealand Defence Force (NZDF) is modernising its approach to deployment screening by shifting from a deficit based sleep model to a strengths based framework. Historically, the Insomnia Severity Index (ISI) has been used to screen for sleep concerns. "While the ISI is clinically valid for identifying insomnia, it provides a limited perspective, as insomnia represents only one of more than 80 recognised sleep disorders and does not reflect the broader role of sleep in supporting overall health and operational performance.

To address this, the NZDF is introducing the RU SATED model into deployment questionnaires. RU SATED is a brief, validated, multidimensional tool that assesses six core dimensions of sleep health: Regularity, Satisfaction, Alertness, Timing, Efficiency, and Duration.

While it is not a diagnostic tool, it provides a structured indication of when further assessment may be required. This shift supports a more holistic understanding of sleep in the military context, recognising not only the risks of poor sleep but also the protective value of good sleep patterns across the force.

This presentation will outline the rationale behind the change, the limitations of disorder-based screening, and the implementation process currently underway. It will also highlight the broader strategic opportunity RU SATED presents for enhancing readiness, guiding future research, and embedding sleep health as a pillar of sustained performance in Defence.

Building Expeditionary Health Readiness through Bush Dentistry

FLTLT Alexis Dieu[1]

1 RAAF, Darwin, Australia

Biography:

FLTLT Alexis Dieu completed a Bachelor of Biotechnology (Honours) in Drug Design and Development in 2008. She spent seven years working in ISO17025-accredited laboratories, contributing to preclinical drug development and pain research. Motivated by a desire for more direct clinical impact, she transitioned from academia to dentistry, completing her dental training in 2018. Over the past four years, while posted in Darwin, she has worked closely with the Northern Territory Government to deliver oral health services to remote Indigenous communities across the NT. In 2023, she spearheaded the development of a remote clinical placement program to strengthen dental teams' expeditionary readiness and clinical capability in austere, resource-limited environments. This initiative significantly enhanced her operational preparedness and played a key role in the successful delivery of oral health services during Exercise Kummundoo 2024 in Kununurra, remote Western Australia.

Bush dentistry is a colloquial term referring to the delivery of oral health services in remote Indigenous communities of the Northern Territory (NT), Australia. In addition to the typical challenges associated with remote healthcare, such as security concerns, logistical limitations, and constrained access to resources, health professionals must also navigate language and cultural barriers unique to each region.

Depending on the size of the community, local health centres often provide capabilities comparable to Role 1 enhanced military health support, including aeromedical evacuation. I have led teams comprising myself and a dental assistant to multiple austere locations across the NT, delivering dental care and engaging with communities on behalf of both the Northern Territory Government and the Royal Australian Air Force (RAAF).

This form of service delivery closely parallels Humanitarian Assistance and Disaster Relief (HADR) operations, exposing dental personnel to complex case management outside the typical Defence demographic. It also serves as a valuable training opportunity, fostering core expeditionary competencies such as resilience, adaptability, task and time management, clinical confidence, decision-making, teamwork, interoperability, and effective communication.

In this presentation, I will highlight the unique advantages and challenges of operating in remote health clinics, and discuss how these experiences cultivate critical thinking and problem-solving skills—key attributes for developing agile, effective leaders in both military and civilian health contexts.

Developing a Platform Agnostic HADR Capability in the RAN

CMDR Scott Squires[1]

1 RAN, Sydney, Australia

Biography:

CMDR Scott Squires is an Emergency Physician with the Australian Defence Force (ADF) Medical Specialist Program. Scott is posted to the Maritime Operational Health Unit, HMAS Penguin as the Director of Clinical Services. Scott originally entered the ADF as part of the Graduate Medical Scheme. Over the past 27 years of service, he has deployed extensively overseas in remote and austere environments, throughout the Middle East and Asia-Pacific regions.

Over the past 25 years the ADF has deployed extensively in support of international and domestic HADR operations.

In the RAN, our amphibious platforms have been the mainstay of such support and this has been one of the roles of the LHD class ships, since their commissioning.

Our experience in support of HADR operations in non-LHD platforms identified that there was a shortfall in capability in such platforms, for HADR taskings.

This presentation will describe our experience in recent HADR operations that lead to the development of a MOHU HADR equipment cache.

This cache, has equipment, medication and consumables to support HADR taskings that is light, rapidly deployable and platform agnostic.

Embedding Cultural Change through a Systems-Based Alcohol Management Framework in the Australian Defence Force

Mr Lucas Liew[1], Ms Kylie Druett[1]

1 Australian Defence Force, Sydney, Australia

Biography:

MAJ Lucas Liew is a Psychology Officer who commissioned into the ADF in 2019. As a Psychologist, MAJ Liew has posted to JHC-SQ MHPS and later in 2021 1 PSYCH UNIT in Townsville where he deployed to OP ACCORDION. In 2022, MAJ Liew posted to 4 HB and was involved in developing a new psychological capability in support of 3 BDE training and supported the DWEP – NQ team. Specifically, the Diversity Leadership Camp, building familiarity to psychological practice to young Australians and First Nation people applying to the Defence. In 2023 he was the OIC of the AHTT at ASH, instructing on mental health subjects throughout the school whilst conducting, maintaining, and improving AAPSYCH courses. Currently, MAJ Liew is the SO2 at the MH&W Initiatives Directorate within DPG, within the Alcohol Tobacco and Other Drugs portfolio. Beyond work, MAJ Liew has an interest towards the computer science, medical literature, and dungeons and dragons.

Kylie Druett is a psychologist and acting/Director of the Mental Health and Wellbeing Initiatives Directorate at Defence. She is responsible for the development and implementation of initiatives that empower personnel and the organisation to improve the mental health and wellbeing. Kylie led the development of the Defence Alcohol Management Framework . Her career spans non-government and state health services in the sectors of domestic violence, child protection, suicide prevention, sexual assault, mental health and AToD. Outside work she advocates for systemic reform in support offered to families bereaved by domestic violence homicide.

The Defence Alcohol Management Framework (DAMF) represents a significant evolution in Defence's approach to alcohol-related harm. Informed by extensive consultation with stakeholders across health, command, policy, and military police domains, the Framework offers a systems-based, ecological model to review and guide policy, leadership, and behavioural change.

The DAMF builds upon previous strategies, including the original Alcohol Management Strategy (ADFAMS), and aligns with the Mental Health and Wellbeing Strategy, Suicide Prevention Action Plans,

and the Defence Cultural Blueprint. It acknowledges the complex cultural, environmental, and individual drivers of alcohol use and introduces a structured approach to prevention, early intervention, and recovery.

The Framework is organised around five core principles – SAFER:

- Strengthen prevention and recovery
- Align organisational policies, protocols, and standards
- Facilitate a low-risk drinking culture
- Evaluation of evidence and effectiveness
- Reinforce positive leadership practices.

These principles are operationalised across three interconnected levels: Enterprise, Team/Group, and Individual, creating a unified direction for policy, training, culture, and health integration.

Through this multi-level approach, the Framework supports proactive alcohol management, promotes informed low-risk drinking behaviours, reduces stigma around help-seeking, and integrates family and broader wellbeing considerations. The accompanying 'blueprint for action' nested within the Framework, ensures accountabilities, implementation pathways, and evaluation mechanisms are embedded into Defence's future alcohol management efforts.

This presentation will provide an overview of the Framework's structure, conceptual underpinnings, consultation process, and its alignment with Defence's wider strategic wellbeing agenda. It will also share insights into leadership engagement, cultural considerations, and implementation opportunities across diverse workplace settings.

Ethical Relevance of the Geneva Conventions and International Humanitarian Law in Medical Operations: Case Studies from Ukraine and Gaza

LTCOL Erin Shelley[1]

1 Australian Army, Adelaide, Australia

Biography:

LTCOL Erin Shelley commissioned in 2009 and was has undertaken a wide range of appointments throughout her career, which have included postings at the Tactical Electronic Warfare Fleet – Land Program Office, the 9th and 10th Force Support Battalions and secondment to the Australian Intelligence Corps.

In 2016, LTCOL Shelley transferred to the Royal Australian Army Medical Corps and has been the Adjutant, Army School of Health, Staff Officer Grade Two of the Military Employment Classification Review Board, Officer Commanding/Health Centre Manager of the Robertson Health Centre and the Military Assistant to Head of the Defence Taskforce supporting the Royal Commission into Defence and Veteran Suicide. LTCOL Shelley's current appointment is as the Senior Health Officer, 10 Brigade.

LTCOL Shelley has an extensive academic background and her operational service has predominately in the Middle East. LTCOL Shelley has Bachelors' of Applied Social Science (Management) and Arts (International Aid and Development), as well as Masters' in Management Studies (Human Resource Management), Strategy and Security and Defence and Military Studies. LTCOL Shelley has served on Operation MAZURKA, Operation ACCORDION and Operation SLIPPER.

Ethical Relevance of the Geneva Conventions and International Humanitarian Law in Medical Operations: Case Studies from Ukraine and Gaza

The Geneva Conventions and broader international humanitarian law (IHL) form the foundation of legal and ethical conduct in armed conflict, particularly in the protection of medical personnel, medical facilities and the wounded. This abstract explores the ongoing relevance and ethical imperatives of these legal frameworks by examining medical operations during two modern conflicts: the war in Ukraine and the conflict in Gaza. The following case studies reveal persistent violations of medical neutrality, a principle enshrined in the Geneva Conventions, and underscore the urgent need for reinforced adherence to IHL in modern warfare.

Ukraine's healthcare infrastructure has faced unprecedented levels of violence since Russia's full-scale invasion in February 2022. The World Health Organization (WHO) has reported over 1,900 attacks on Ukrainian healthcare facilities: the most recorded in any single humanitarian crisis. Hospitals, ambulances and medical workers have been consistently targeted by missile strikes, often through so-called 'double tap' attacks that harm both the injured and their rescuers. One notable case involved a Russian drone strike on the Panteleimon Hospital in Sumy that resulted in numerous civilian casualties, including medical personnel. These attacks contravene the core IHL mandate to protect the wounded and those offering care without discrimination or delay. Despite these risks, Ukraine's medical response remains active, with paramedics and humanitarian organisations

such as the Red Cross striving to maintain services under fire. The legal and ethical relevance of IHL here is demonstrated by its consistent invocation in war crimes documentation and international advocacy aimed at protecting health services.

Similarly, the ongoing conflict in Gaza, particularly since October 2023, has seen significant breaches of IHL with catastrophic implications for the civilian population. Israeli military operations, combined with a blockade and large-scale population displacement, have led to the collapse of Gaza's healthcare system. The WHO and the United Nations Office of the High Commissioner for Human Rights (OHCHR) have reported over 670 attacks on medical facilities, including deliberate strikes on hospitals and ambulances. These attacks have resulted in hundreds of deaths among medical personnel, patients and civilians seeking refuge in healthcare facilities. The Israel Defense Forces (IDF) have argued that some hospitals were used for military purposes by Hamas, yet the principle of proportionality and precaution under IHL remains paramount. Even when medical facilities are allegedly misused by combatants, they retain a high threshold for loss of protection under IHL. Furthermore, ethical standards dictate that humanitarian corridors and the neutrality of medical care must be respected at all times.

Both conflicts exemplify how medical neutrality is not merely a legal abstraction but a humanitarian necessity. Violations in Ukraine and Gaza have led to immense suffering and have prompted widespread condemnation by international bodies. The WHO, ICRC, and other human rights organisations have all underscored the ethical imperative of respecting medical operations in conflict zones. These cases illustrate that while IHL is often flouted, it continues to serve as a vital framework for holding perpetrators accountable and guiding ethical conduct in war.

The Geneva Conventions' protections for medical missions remain ethically indispensable in modern conflicts. They reflect a collective moral understanding that care for the wounded, whether combatant or civilian, must transcend the hostilities of war. The persistent violations observed in Ukraine and Gaza highlight the need for renewed commitment to these principles. Upholding IHL in medical operations is not only a legal imperative but an essential affirmation of shared humanity amid the devastation of war.

Far-Forward Oxygen Delivery in Tactical Combat Casualty Care: A New Approach Using Rugged Chemical Oxygen Generation

Mr Alex Charlesworth[1]

1 Owen International Pty Ltd, Artarmon, Australia

Biography:

Alex is a Program Manager at Owen International, with over 20 years of experience in the Australian Defence sector. Originally from the United Kingdom, he holds an Honours degree in Chemistry with Pharmaceutical Chemistry from Heriot-Watt University in Edinburgh. After relocating to Australia, Alex has built a career supporting the delivery of advanced Defence capabilities, transitioning from a background in technical sales to senior program management.

At Owen International, Alex plays a leading role in the delivery of complex systems across major Defence platforms. His recent work includes capability delivery for the Hunter Class Frigates and LHDs, as well as managing ongoing system upgrades across multiple ADF platforms. His experience spans program delivery, stakeholder engagement, and systems integration in high-stakes operational environments.

Alex has deep expertise in life-support technologies, particularly Chemical Oxygen Generators from Molecular Products, where he has supported system specification, compliance, and deployment for military use. His blend of technical acumen and program leadership enables him to navigate the evolving needs of Defence programs with precision and foresight.

He remains focused on enhancing ADF operational capability through innovation and robust delivery frameworks, especially within the SME landscape.

Background

In Tactical Combat Casualty Care (TCCC), the ability to deliver oxygen at the point of injury (POI) is critical to reducing mortality and morbidity. Early oxygen therapy mitigates hypoxaemia—one of the key contributors to preventable battlefield deaths. This is particularly relevant in polytrauma, blast injury, thoracic trauma, and for the up to 80% of Chemical, Biological, Radiological, and Nuclear (CBRN) casualties who benefit from immediate oxygen therapy. Despite this, oxygen delivery in far-forward or austere environments remains limited due to the weight, fragility, and explosive risk of traditional compressed gas cylinders.

Challenge of Conventional Systems
Compressed oxygen cylinders are heavy, require regular inspection and maintenance, and pose logistical challenges in air transport and field resupply. More critically, they are vulnerable to ballistic impact, creating safety risks for medics and patients alike. These limitations have historically precluded their use at the POI, leaving a critical gap in care capability for frontline medics.

Emerging Evidence on Oxygen Therapy
Recent trials and guidelines, including the TRAUMOX2 trial (2023) and updated TCCC Guidelines (2024), reinforce that early, titrated oxygen therapy can significantly improve trauma outcomes. A growing body of evidence advocates for controlled, low-flow oxygen (<6 L/min), which reduces the risk of hyperoxia while conserving limited oxygen supplies—especially relevant in dismounted or prolonged field care scenarios. The emphasis is shifting from high-flow blanket administration to targeted, judicious use based on SpO_2 and clinical status.

The Rugged Oxygen Generator (ROG)
In response to this capability gap, the Rugged Oxygen Generator (ROG) has been developed—a novel, portable, chemical oxygen generator engineered specifically for use in austere and combat environments. Originally adapted from proven naval technology used in submarines and mine rescue chambers, the ROG is designed to provide safe, immediate, and reliable oxygen at the POI.

Each ROG unit delivers ≥96% oxygen at a consistent flow rate of 6 L/min for 15 minutes—enough to bridge critical transport delays or sustain a casualty until advanced care is reached. It is activated by a simple mechanical mechanism, requires no batteries or electronics, and has an extended shelf life with zero maintenance. Critically, unlike pressurised cylinders, the ROG cannot explode or combust when exposed to ballistic or explosive threats.

The ROG has been independently tested to MIL-STD-810G/H standards for environmental and mechanical durability. It remains functional after exposure to shock, vibration, temperature extremes, and projectile impact, making it suitable for carriage in combat medic packs or vehicle IFAKs. At just over 2 kg, it is lightweight and compact enough for dismounted operations.

Operational Advantages
The ROG presents a step-change in oxygen availability in tactical environments, offering:

- Safe storage and use in proximity to munitions or fire
- Shelf-stable and logistically simple deployment
- Compatibility with CBRN protocols and enclosed environments
- No risk of overpressure injuries or equipment failure due to impact

Conclusion
In the golden hour of trauma care, the ability to deliver oxygen safely, immediately, and effectively at the point of injury is now achievable. With the increasing emphasis on conservative, controlled oxygen therapy and the operational demands of expeditionary and peer-threat environments, the ROG provides a practical and scalable solution. By removing the logistical and safety barriers of compressed gas, the ROG empowers medics to deliver life-saving oxygen in places previously thought impossible—whether under fire, in tunnels, or within contaminated zones.

References

- Kirkman et al. (2024) Portable Oxygen Systems in Austere Environments
- The TRAUMOX2 Trial (2023)
- Committee on TCCC Guidelines (2024 Update)

Female Veterans' Perspectives on the Impact of Chronic Pain and Challenges to Obtaining Optimal Health Care.

Dr Rebecca Mellor[1], Ms Kelly Brown[1]

1 Gallipoli Medical Research, Greenslopes, Australia

Biography:

Dr Rebecca Mellor is a Principal Research Fellow at Gallipoli Medical Research, working within the Healthy Veterans Research Program. Her research focuses on improving the health and wellbeing of veterans by identifying and addressing key contributors to disease burden. With a background as a musculoskeletal physiotherapist and a clinician scientist, Dr Mellor brings a strong translational focus to her work. She has previously conducted research at the University of Queensland and the Centre for Military and Veterans Health, and has published over 40 peer-reviewed papers and two book chapters. Her

work is driven by a commitment to promoting holistic, evidence-based approaches to enhance veterans' quality of life.

Since 2011, the number of females in the Australian Defence Force (ADF) has grown substantially. By 2021, women comprised 21.2% of the Regular ADF. Female service members experience a higher rate of injuries than males. Contributing factors include physiological and biomechanical differences, use of equipment tailored to male physiques, heavy load carriage, and female-specific health concerns. Additionally, women in the military face elevated rates of post-traumatic stress disorder (PTSD) and military sexual trauma (MST), associated with more severe pain symptoms. As more women transition into civilian life, a growing cohort will require support for a range of complex, service-related health issues. However, civilian health care providers may not fully understand military culture or specific needs of female veterans. This gap in understanding can lead to suboptimal management of health conditions. Furthermore, both healthcare providers and veterans often lack awareness of the full scope of entitlements available through the Department of Veterans' Affairs (DVA).

This qualitative study explored female veterans' experiences of chronic pain and the challenges they face accessing appropriate care. Conducted through six online and in-person focus groups, the study involved 23 ex-serving female ADF members with chronic pain (mean age 52 years). Participants had served in the Navy (30%), Army (44%), or Air Force (26%) for an average of 6.6 years. Chronic pain duration ranged from 4 to 60 years. Data were thematically analysed using an inductive approach, resulting in four overarching themes: 1) The pain journey, 2) barriers to optimal care, 3) experiences with DVA, and 4) facilitators for better care.

Under Theme 1, participants described how pain can stem from basic training injuries or overuse strain. Causes included using poorly-fitted gear, enduring physically demanding tasks e.g. rucksack marches, and meeting high physical training standards. Many described the profound biopsychosocial impacts of pain, particularly on daily functioning, mental health, and quality of life. Pain interfered with work and day-to-day activities. Comorbidity was highlighted, with several women discussing a vicious cycle in which chronic pain worsened mental health, in turn exacerbating pain. Military culture and perceived societal stigmas also shaped how participants managed their pain. The ingrained "push through" mindset discouraged and stigmatized help-seeking, often delaying diagnosis and intervention.

Theme 2 explores how, when seeking care, many veterans encountered systemic barriers, such as difficulty navigating healthcare systems, difficulty accessing services, and health professionals' lack of understanding of military life and DVA processes. Many were unaware of available DVA-funded treatments and entitlements, as were some providers. Other factors included financial outlay, location, timing factors, poor social support, and the burden of self-advocacy.

Theme 3 describes experiences with DVA. While some shared positive experiences, navigating the DVA system was described as a slow and stressful process. Frustrations arose with time delays, challenges accessing supporting evidence, fighting for condition acceptance and gender bias in policies. Risk of misuse of the system was acknowledged.

Despite these obstacles, participants identified helpful management strategies, and offered suggestions for improving healthcare delivery for female veterans (Theme 4). These included training clinicians in military cultural awareness including female specific risk factors, providing holistic and trauma-informed care, facilitating continuity of care, and increasing awareness of available services.

This study highlights the complex interplay between chronic pain, military service, and gender, and underscores the need for targeted, veteran-informed healthcare approaches. Findings reinforce the importance of improving education for primary care providers, fostering military cultural competence, and addressing systemic barriers to better support the health and wellbeing of female ADF veterans. Recommendations for the development of education materials are presented.

Force Health Protection Health Superiority as a Battlefield Multiplier

WO Lee Matthews[1]

1 *Australian Defence Force School Of Health, Latchford Barracks, Australia*

Biography:

Warrant Officer Class 1 Lee "Snowy" Matthews has served 29 years in the Australian Regular Army. He began as a rifleman with the 5th/7th Battalion, Royal Australian Regiment before transferring to the Royal Australian Army Medical Corps as a Preventive Medicine Technician - motivated by his own experience contracting malaria during a deployment to East Timor.

Throughout his career, WO1 Matthews has delivered force health protection across multiple domestic and international operations. Now posted to the ADF School of Health as the Preventive Medicine Manager, he focuses on developing training that is practical, relevant, and grounded in lived operational experience. His goal is simple: steady, meaningful improvements that keep soldiers safe, healthy, and in the fight.

Imagine a war where the soldiers didn't get sick or injure themselves… In Large Scale Combat Operations (LSCO), where adversaries contest every domain, sustaining combat power demands not only superior trauma care but also rigorous prevention of Disease and Non Battle Injuries (DNBI). The "River Story" parable illustrates the imperative of shifting effort upstream to prevent losses rather than solely downstream rescue. It explores asymmetric healthcare in war—using preventive health as a force multiplier, and examines why commanders often default to treatment emphasis. Key health capabilities for littoral LSCO are identified, with guidance on allocating resources in a preventive-to-reactive care ratio. A hypothetical model quantifies combat effectiveness improvements as DNBI rates drop from the accepted 60% to 30%, detailing potential operational scenarios. The brief concludes by outlining how commanders can harness health protection to give them a competitive edge in achievement of battlefield supremacy.

From Past to Present: How Pre-Service Trauma and Current Cognitive and Behavioural Processes Shape PTSD Risk in Military Personnel

Prof Jennifer Wild[1,2,3], Dr Katrina Moss[1,4], Dr Zoe Jenkins[1], A/Prof Lisa Dell[2]

1 *Directorate of Health Research, Joint Health Command, Department of Defence, Canberra, Australia*

2 *Phoenix Australia Posttraumatic Centre for Mental Health, Department of Psychiatry, University of Melbourne, Melbourne, Australia*

3 *Department of Experimental Psychology, University of Oxford, Oxford, United Kingdom, Oxford, United Kingdom*

4 *Australian Women and Girl's Health Research Centre, University of Queensland, Brisbane, Australia*

Biography:

Jennifer Wild is Professor of Military Mental Health at Phoenix Australia, University of Melbourne, the Australian Defence Force, and Visiting Professor of Experimental Psychology at the University of Oxford. Her area of expertise is in developing interventions to prevent the onset and persistence of PTSD and major depression in high risk occupations at risk of trauma, such as military members, and in developing and evaluating evidence-based interventions for anxiety and stress disorders. She is dedicated to improving treatments so they are more precise and effective and reach the people who need them most. She has written over 100 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. Professor Wild regularly appears in the media giving advice rooted in science for preventing the onset and persistence of trauma-related mental health problems.

Background

Individuals who enter high-risk professions, such as military service, often report histories of trauma exposure, including exposure to childhood trauma. These early traumatic events are associated with increased vulnerability to post-traumatic stress disorder (PTSD) when faced with additional trauma. It is unclear which psychological processes may protect against or increase the risk of developing PTSD when service members encounter new potentially traumatic events. Our study examined how cognitive and behavioural processes, particularly rumination, social support and coping strategies, influence PTSD risk in military recruits with varying levels of pre-service trauma exposure.

Method

Participants were Australian Defence Force (ADF) members recruited between November 2009 and 2016 who were followed for five years as part of the Longitudinal ADF Study Analysing Resilience. 2,456 participants completed questionnaires assessing trauma exposure, PTSD symptoms, rumination, social support, and coping strategies at four time points: after training, and at three annual follow-ups. Pre-service PTEs were categorised as low (0-3 PTEs), high (4+ PTEs), and childhood abuse. We used random-effects logistic regression with predictors entered in sequential steps, beginning with demographics (gender, rank, service), followed by pre-service PTEs, during service PTEs, cognitive-behavioural factors (social support, coping strategies), and finally, cognitive processes (rumination). The study was approved by the Australian Defence Human Research Ethics Committee (protocol number: 556-09).

Results

The model showed the largest improvements in fit with the addition of social support and coping

strategies, and again with the addition of rumination. Exposure to potentially traumatic events during service significantly increased PTSD risk across all pre-service trauma categories. Risk was highest amongst those with pre-service childhood abuse (OR=1.79, 95% CI [1.25, 2.58], p=0.002) and those with 4+ pre-service PTEs (OR=1.51, 95% CI [1.1 7, 1.95], p=0.001). Low to moderate levels of positive social support were associated with significantly increased risk. Risk was also significantly elevated among those who employed few coping strategies or who used avoidance-based coping. Each one-point increase in rumination was associated with 32% higher odds of developing PTSD symptoms. Regarding trauma exposure patterns, service-related traumatic events increased PTSD risk regardless of pre-service trauma history. However, individuals with 4+ pre-service traumatic events showed elevated PTSD risk only when exposed to additional service-related trauma. Those with childhood abuse histories showed elevated PTSD risk even without exposure to trauma during their early years of service. When exposed to traumatic events during service, their risk level was comparable to individuals with high pre-service trauma exposure.

Discussion

The findings suggest three potential vulnerability pathways to probable PTSD symptoms: childhood abuse creates an enduring vulnerability even without additional trauma exposure; multiple pre-service traumas create vulnerability that is activated by service-related trauma; and trauma during service can create risk regardless of pre-service trauma history. Importantly, the substantial improvements in model fit when adding cognitive and behavioural processes suggest that social support, coping strategies and rumination play a significant role in determining PTSD symptom outcomes. Interventions targeting modifiable cognitive and behavioural processes may help to reduce PTSD risk across all groups.

Note: The opinions expressed in this abstract are that of the authors/presenters, and not of the Department of Defence.

Gender Differences in Reintegration and Adjustment to Civilian Life Among Ex-Serving ADF Members

Dr Jie Hu[1,2], Dr Pilar Rioseco[1,3], Dr Karolina Alichniewicz[1,2], Dr Andre Tan[1,2], Dr Camila Guindalini[1,2]

1 *Gallipoli Medical Research, Greenslope, Australia*

2 *School of Medicine, The University of Queensland, Brisbane, Australia*

3 *School of Public Health and Social Work, Queensland University of Technology, Queensland, Australia*

Biography:

Dr Jie Hu is a Research Fellow at the Gallipoli Medical Research and an Honorary Research Fellow at the University of Queensland. Dr Hu has over 15 years of experience in public health and health services research across academic, community, and government settings in Australia, New Zealand, and China.

Her expertise spans mixed-methods research, systematic reviews, data linkage, statistical and health economic analysis, and program evaluation. She has led and contributed to projects focusing on veteran health, Indigenous health, mental illness, and primary care services, with a strong emphasis on collaborative, culturally sensitive approaches. Dr Hu has authored multiple peer-reviewed publications and regularly presents research findings at academic and community forums. Committed to evidence-informed health policy and practice, Dr Hu's research aims to improve health outcomes for vulnerable populations through rigorous data analysis, stakeholder engagement, and strategic knowledge translation.

Background

A significant number of women have served in the Australian Defence Force (ADF) and transitioned to civilian life, comprising approximately 14% of the total veteran population. While the transition presents challenges for all ex-serving members, female and male veterans may encounter distinct psychosocial and health-related stressors. These differences may stem from variations in military experiences, occupational roles, and broader social expectations. Understanding gender-specific reintegration factors is essential for informing targeted support strategies and enhancing outcomes. This study explores gender differences in reintegration and adjustment among ex-serving ADF members, focusing on psychosocial, physical and mental health challenges.

Methods
This study utilised data from a sample of 724 ex-serving ADF members who completed an online questionnaire capturing demographic and military service details, along with reintegration and transition experiences. Psychosocial adjustment and cultural reintegration challenges were measured using the 21-item Military-Civilian Adjustment and Reintegration Measure (M-CARM), which assesses difficulties across five psychosocial areas: purpose and connection, help seeking, beliefs about civilians, resentment and regret, and regimentation. Physical and mental health were assessed using a range of validated instruments, such as the 21-item Depression Anxiety Stress Scale (DASS-21), the Walter reed functional impairment scale (WRFIS), the World Health Organization Disability Assessment Scale (WHODAS), and the Nightmare Distress Questionnaire (NDQ). Gender differences were analysed using independent t-tests for continuous variables and Chi-squared tests for categorical variables. Multiple logistic regression models were employed to identify associating factors for self-reported reintegration for female and male veterans separately.

Results
Female participants comprised 21.4% of the sample (155 out of 724). Compared to male participants, they were younger (42.4 vs 45.2 years; $p < 0.05$), less likely to be in a marital or de facto relationship (67.7% vs 82.8%; $p < 0.001$) or have children (61.9% vs 79.8%, $p < 0.001$). They also reported shorter service duration (12.5 vs 16.5 years; $p < 0.001$), although time since discharge was similar. Women were less likely to have served in combat roles (51.6% vs 67.8%; $p < 0.001$) and more likely to be medically discharged (43.9% vs 33.2%; $p < 0.05$). Additionally, fewer female veterans served in the Army (47.1% vs 65.2%; $p <0.001$), while more had served in the Navy (32.3% vs 19.7%; $p = 0.001$).

Female participants reported a lower prevalence of sustained injuries and PTSD diagnoses. However, no significant difference was observed in findings from other health and functioning measures. Rates of self-reported successful reintegration rates and perceived difficulty of transition were also similar. Nevertheless, female veterans reported significantly higher total M-CARM scores (mean = 66.8, SD = 17.9) than male veterans (mean = 63.4, SD = 16.5; $p < 0.05$), indicating fewer psychosocial challenges. A smaller proportion of female participants reported difficulties in the beliefs about civilian domain (72.3% vs 81.7%, $p = 0.013$) and the regimentation domain (56.8% vs 69.1%, $p = 0.005$), compared to their male counterparts.

Among both women and men, reintegration were significantly associated with unemployment, a reduced sense of purpose and connection, and challenges related to problematic regimentation behaviours. For women, having been medically discharged was also significantly associated with reintegration challenges. For men, negative beliefs about civilian life and a longer duration since discharge were significantly linked to greater challenges.

Conclusions
This study identified substantial gender differences in demographic characteristics, service experiences, psychosocial challenges during reintegration. While female and male veterans may report similar reintegration success overall, their experiences are shaped by differing factors. These findings underscore the importance of gender-sensitive transition services and support strategies that are tailored to the distinct needs of ex-serving ADF members.

Governance is Not a Dirty Word

LTCOL Tara Miller[1]

1 Department Of Defence, Australia

Biography:

Lieutenant Colonel Tara Miller commissioned into the Royal Australian Army Medical Corps in 2006 as a Pharmaceutical Officer. She has held diverse leadership roles across health, logistics, and operations, including deployments on Operations ACCORDIAN and OKRA. Promoted to Major during her first deployment, she later commanded the 3rd Health Support Company, driving cultural change and leadership development. She has supported major domestic operations including Op BUSHFIRE ASSIST and Op COVID ASSIST, and currently serves in Defence People Group on SERVOP C.

Lieutenant Colonel Miller holds degrees in Pharmacy and Organisational Leadership and is a registered Consultant Pharmacist. Her civilian experience spans logistics, finance, and governance. Promoted to Lieutenant Colonel in 2023, she completed Australian Command and Staff College – Remote the same year.

She is married to Stephen, with whom she shares four children and a lively household of pets. Outside of work, she enjoys reading, dancing, and community engagement, including running a successful non-fiction book club.

Governance is Not a Dirty Word: Enabling Enterprise Mental Health and Wellbeing Through Balance, Communication, and Leadership

In Defence, the promotion of mental health and wellbeing is increasingly recognised as foundational to capability, resilience, and operational readiness. Yet, the governance of wellbeing programs is often misunderstood—seen as bureaucratic overhead rather than a strategic enabler. This presentation reframes governance as a vital tool for delivering enterprise-wide wellbeing initiatives that are effective, inclusive, and aligned to strategic intent.

Governance, in this context, is how we make decisions, stay accountable, and ensure that wellbeing efforts are meaningful, measurable, and people-centred. When done well, governance provides clarity of purpose, supports leadership, and fosters trust across the organisation. It will support the achievement of a wellbeing program that is not just well-intentioned, but well-executed—delivering value for money, confidence in delivery, and outcomes that matter.

We begin by exploring the cost of poor governance in programs and projects. We will present several examples to illustrates how unclear roles, fragmented oversight, and lack of stakeholder engagement led to duplication, disengagement, and missed opportunities to support people – these examples are the Volkswagon emissions scandal and the UK NHS Mid Staffordshire Trust. Without clarity, ownership, and feedback loops, even the most promising initiatives can falter.

Reimagining this scenario with effective governance reveals a different outcome: clear responsibilities, inclusive design, and open communication channels. Adaptive risk management and collaborative leadership transform the initiative into a responsive, trusted program that supports both individual wellbeing and organisational goals. This contrast highlights governance as a mechanism for strategic alignment, transparency, and continuous improvement.

We then explore how governance can act as an enabler—not a blocker—of wellbeing promotion. Good governance connects stakeholders across project, clinical, command, and support domains. It fosters understanding, opens space for innovation, and supports wellbeing initiatives that reflect both strategic priorities and the lived experience of Defence personnel. A case study will demonstrate how governance supports rapid adaptation, morale preservation, change adoption and continuity of support.

Governance also strengthens change management. Models like ADKAR and Kotter gain traction when supported by structured governance. By embedding communication, stakeholder engagement, and people-centred design into governance processes, resistance is reduced and ownership is increased. This is especially critical during wellbeing reforms, capability transitions, or the rollout of new enterprise programs.

However, governance must be proportionate. Over-governance leads to bureaucratic drag, decision paralysis, and disengagement—often referred to as "death by working group." Under-governance results in unclear authority, inconsistent messaging, and risk exposure. Mis-governance—where processes exist only to tick boxes—erodes trust and wastes resources. An example of excessive governance illustrates how well-intentioned oversight became a barrier to meaningful action, adding complexity without value.

We introduce the concept of the "Goldilocks Zone"—governance that is just right. Fit-for-purpose, agile, and accountable governance supports wellbeing promotion, psychological safety, and mission outcomes. It is deliberately designed, continuously improved, and tailored to the environment. Whether at the project or program level, proportionate governance ensures value for money, responsible use of public funds, and alignment with strategic goals. The example we will use of good governance is the Norwegian oil fund.

We conclude with a call to action: challenge the narrative. Governance isn't a dirty word—it's your tool for delivering excellent wellbeing outcomes in an uncertain world. In Defence, where wellbeing underpins capability, governance provides the confidence, clarity, and connection needed to lead effectively and care responsibly.

Implications for Australia of the 2025 Update to NATO STANAG 2939 Minimum Requirements for Blood, Blood Donors and Associated Equipment

Brigadier Michael Reade[1], Mr Paul Naveau[1]

1 Joint Health Command, Canberra, Australia

Biography:

BRIG Michael Reade

Brigadier Reade is an intensive care physician, anaesthetist and clinician scientist, appointed in 2011

as the inaugural Professor of Military Medicine and Surgery at Joint Health Command. From 2015-2018 he was additionally the Director of Clinical Services of the 2nd General Health Battalion, and from 2019-2022 he was Director General Health Reserve - Army. Since 2022 he has been Head of the Greater Brisbane Clinical School of the University of Queensland, overseeing teaching at UQ's 10 Brisbane teaching hospitals, >200 general practices and the university campus. He remains an advisor to Joint Health Command on research and education, represents Australia on the NATO Blood Panel, and Chairs the Five Eyes Science & Technology Collaboration Military Medicine Panel. His research programs cover trauma systems design, blood and fluid resuscitation in trauma, and traumatic brain injury.

Mr Paul Naveau

Paul Naveau is the Director of Health Materiel, Logistics and Pharmacy for Joint Health Command. In that role, held since 2012, he is charged with the delivery and management of health materiel across Defence and is responsible for the engagement with key government agencies and organisations for the delivery of health materiel products and services into Defence.

On 26 February 2025, the North Atlantic Treaty Organisation (NATO) Blood Panel approved the final draft of an update to the 2018 Standardisation Agreement (STANAG) 2939 Minimum Requirements for Blood, Blood Donors and Associated Equipment. Australia, one of five NATO Partner Interoperability Advocacy Group (PIAG) nations, contributed to this update, ensuring congruence with Australian civilian and military requirements. New elements of the updated 2025 STANAG and its Standard Related Document that are particularly relevant to Australia include:

- Definition of three categories of blood for transfusion: Category 1 (obtained from regulated blood suppliers in NATO and PIAG nations); Category 2 (obtained by NATO / PIAG forces in the Area of Operations, using NATO-mandated protocols), and Category 3 (sourced from a host nation, outside the control of a NATO / PIAG military force). Category 3 blood was added to match the new transfusion policy of the Australian National Trauma and Critical Care Response Centre.
- Agreement that if Category 1 blood and blood components are acceptable within the regulatory framework of the supplying nation and the STANAG, they would be acceptable for use by NATO. This overcomes a major barrier to interoperability.
- Requirement to test Category 1 blood for pathogens that match Australian standard practice (i.e. HIV 1/2, Hep B, Hep C), with additional optional testing according to prevalence of disease in specific populations (e.g. addition of West Nile virus, malaria).
- Retention of cryopreserved blood components, with guidance for planners on when these would be preferred to other alternatives, such as the distributed maritime or deployed contingency operations of particular relevance to Australia.
- Definition of Emergency Blood Collection and Contingency Blood Collection within Category 2 blood, with considerations for the establishment and use of an Emergency Donor Pool. Along with these definitions, retirement of the term "walking blood bank".
- Endorsement of technical considerations for testing Category 2 universal donor whole blood, including threshold anti-A and anti-B levels, nature and timing of testing for infection, and use of RhD-positive red cells in females of child-bearing age. Acceptance that Category 2 blood need not be subjected to Nucleic Acid Testing prior to transfusion, which matches current Australian deployed capability.
- Requirements for informed consent from both donor and (where possible) recipient that match civilian Australian criteria.
- Adoption of three types of donor screening questionnaire, to be used in three distinct circumstances: a. Category 1 blood, and establishment of an Emergency Donor Pool in the nation of origin: to use whatever questionnaire is used by national civilian blood services. In many nations, including Australia, these questionnaires have become less risk-averse, e.g. allowing donations from males who have sex with men. The NATO policy endorses these changes in the context of the high-sensitivity testing for transfusion transmitted infection available in the national support base, avoiding the potential problem of military policy conflicting with domestic civilian policy. b. from pre-screened donors immediately prior to donation in the operational environment. This questionnaire asks about current health, and about risks that might have been introduced subsequent to high-sensitivity testing. The additional risk questions (e.g. regarding sexual activity, recent tattoos) are designed to exclude a larger proportion of potential donors, due to the lower sensitivity of deployed testing methods. c. From donors who have not been prescreened.

This questionnaire asks about current health and about lifetime risks that would increase the probability of a potential transfusion-transmitted infection, again noting the lower sensitivity of deployed testing methods.

- A minimum standard training curriculum for personnel collecting, processing and transfusing Category 2 and 3 blood.

The ADF will no doubt wish to consider these policies when revising its own Transfusion Manual.

Invictus: Recovery, Rehabilitation, and Reintegration for Current and Former Serving Personnel through the ADF's Adaptive Sports Program

Mr Brian Heilbronn[1,2]

1 James Cook University, Townsville, Australia,

2 Australian Army, Townsville, Australia

Biography:

Brian Heilbronn is currently the Head of Strength and Conditioning for the Australian Defence Force's Adaptive Sports Program (ASP), a role he has assumed since February 2024 where he has overseen the preparation for the 2024 Warrior Games and 2025 Invictus Games. Brian is also a Lecturer in Exercise and Sport Science and Exercise Physiology at James Cook University and leads JCU's Veterans' Sports Performance Program. With nearly 20 years of service in the Australian Army, Brian has transitioned from a full-time infantry soldier to an active reservist in a specialist officer role, focusing on human performance optimisation. Brian is undertaking a PhD, examining the physiological demands of occupational training in infantry soldiers, in collaboration with the Australian Army. Brian is an accredited ASCA Professional Level 2 coach and TSAC Level 1 trainer, with experience across weightlifting, powerlifting, athletics, NRL match officials, and general, adaptive, and tactical/occupational strength and conditioning, and has delivered presentations at numerous ASCA Coach Accreditation courses both in Australia and internationally.

The Australian Defence Force (ADF) Adaptive Sports Program (ASP) is a multi-sport initiative for wounded, injured, or ill current and former ADF personnel. It features both domestic and international events, with teams for the Invictus Games and Warrior Games selected from ASP participants. The ASP supports recovery, rehabilitation, and reintegration, while promoting lifelong involvement in sport.

Previously the Powerlifting coach for the ASP at the 2017 and 2018 Invictus Games, Brian Heilbronn returned in 2024 as the Head of Strength and Conditioning - A newly created role in the ASP for the 2024 Warrior Games and 2025 Invictus Games campaigns. Drawing on firsthand experience, Brian has witnessed the profound, life-changing impact the ASP has had on athletes he has worked with within the program.

This session will explore the unique challenges faced by the ASP staff in managing highly diverse teams of adaptive athletes, including varying fitness levels and training backgrounds, multiple sport demands, and chronic injuries. Brian will outline how the strategic use of technology, data, athlete education and a multidisciplinary approach created an environment that supported sustainable physical preparation, recovery, and performance. These strategies not only enhanced athletes' health and fitness but also fostered long-term engagement in physical training and healthy lifestyle habits.

By sharing insights from his experiences, Brian will illustrate the powerful role the ASP can play in the recovery, rehabilitation and reintegration of current, transitioning, and former ADF personnel. This presentation is suited for those interested in working with, or participating in, adaptive sports or those seeking to understand how programs like the ASP contribute meaningfully to the broader continuum of care for wounded, injured or ill ADF personnel and veterans.

Leading Minds Left Behind: Why the Mental Health of Leaders Can't be an Afterthought

Dr Kylie Tuppin[1]

1 Private Practice & Australian Army, Australia

Biography:

Kylie Tuppin is a clinical psychologist with a background in military psychology, working in mental health and occupational psychology roles and in capability management. She holds a PhD in Organisational Psychology, and Masters degrees in Clinical Psychology and War Psychiatry. She is the Managing Director of KT Psychology and Consulting, where she works with people managing a wide range of psychological concerns, and consults in psychological selection and personnel management, including leadership and high-performance development. She also holds a strong interest in individual and organisational wellbeing practices. Kylie has served

for more than 25 years in the Australian Army as a psychology officer, and throughout her career has gained expertise in strategic personnel and health policy, recruitment and selection, clinical assessment and counselling, and service delivery management. She has deployed several times in support of military operations to war zones, peacekeeping and disaster responses.

Effective organisational leadership plays a pivotal role in shaping the mental health and wellbeing of individuals and teams, influencing not only psychological outcomes but also performance, cohesion and retention. Leaders set the tone for organisational culture, psychological safety, and the prioritisation (or neglect) of wellbeing initiatives. In high-demand and reactive contexts like the military, where psychological strain is often normalised and operational readiness is paramount, leadership is especially critical. Numerous studies have demonstrated that supportive command environments correlate with reduced incidences of mental illness such as PTSD, increased help-seeking, and stronger unit functioning. Yet, paradoxically, the mental health of leaders themselves is frequently overlooked, despite their central role in both managing the wellbeing of others and ensuring mission success.

This presentation explores the unique psychological demands that can heighten the vulnerability of leadership to mental health challenges, and the impact of these challenges upon their individual performance and the performance of their team. It focuses on the impact of uncontrollable external events on leaders' wellbeing and functioning, even when it does not result in mental illness, through three key parts:

1) Identification of leadership-specific wellbeing factors, spanning organisational demands (such as decisiveness, emotional control, and constant availability) and individual traits (such as environmental mastery), considered within frameworks of resilience and wellbeing from an individual and organisational (military) perspective. The use of performance as a measure of wellbeing is also examined.
2) Presentation of data from a PhD study examining the long-term career trajectories and wellbeing of 1,393 Australian Army officers. The study assessed how operational deployment experiences influenced future promotion recommendation outcomes, with a particular focus on how negative events may impact mental health and in turn their longer-term performance. While overall deployment experience temporarily affected career intentions but not progression, exposure to potentially traumatic events was linked to short-term negative impacts on promotion board outcomes, even in the absence of reported distress at the time of the deployment. This suggests that such events can place a significant amount of pressure on leaders that potentially affects outcomes, even when they maintain positive wellbeing behaviours.
3) A broader discussion of these findings in light of organisational wellbeing frameworks and current mental health policy practices, with implications for how military institutions understand, support and sustain the mental health of their leaders. This is also considered against broader organisational factors such as unit performance. Thus, leader wellbeing is not just an individual consideration, it is a lever for collective good health and high-performing organisational culture. This presentation argues for deeper insight into resilience and coping among leaders, and stronger organisational measures to protect their psychological wellbeing.

Maximising Military Healthcare Capability: Evolving Perioperative Nursing Roles for a Dynamic Future.

LCDR Jen Evans[1], LEUT Cassandra Felsher

1 Navy Health Services, , Australia

Biography:

LCDR Jen Evans; Nursing Officer, RAN. Perioperative Nurse Surgeons Assistant (PNSA) and Perioperative CNS – Cardiothoracics.

**27 years experience perioperative nursing. Main focus is Cardiothoracic Surgery, special interest in Adult Congenital Heart Surgery.*

**2013 qualified PNSA and works as an assistant in Cardiothoracic surgery.*

**2003 joined the RAN as a specialist Nursing Officer. Deployed with the ADF. Most recently deployed to Iraq and involved with the NEO evacuation of Afghanistan. Previously deployed to Afghanistan and Banda Aceh*

**Currently SO2 Nursing (Periop/Medical/Mental Health) NHS SERCAT3-5 command structure.*

Since 2002 volunteered with Open Heart International, completing 36+ trips providing paediatric cardiac surgery to children in Rwanda, PNG, Fiji, Tonga, Vanuatu, Tanzania, Bolivia. A love of working

in austere environments with limited resources, including clinical teaching to non-English speaking health professionals.

LEUT Cassie Felsher RAN - Perioperative Nurse Specialist, Nursing Officer, Perioperative Nurse Surgical Assistant

**10 years experience perioperative nursing, Main focus on General Surgery.*

**2024 qualified PNSA and works as an assistant in General Surgery.*

**2020 joined the RAN full time as a Specialist Nursing Officer and has deployed with the ADF. Most recent deployment to PNG and IPE, HMAS Adelaide. Currently completing consolidation year to develop her as a surgical assistant.*

Background
The aim of this presentation is to explore how the Perioperative Nurse Surgical Assistant (PNSA) role is evolving as an integral role in the civilian setting, and discuss how it will maximise military healthcare capability to meet the increasingly dynamic healthcare demands of the future. In military healthcare, where teams often operate with limited resources in austere and unpredictable conditions, the integration of PNSAs offers a significant opportunity to build a more adaptable and resilient perioperative workforce. Historically, PNSA's have played a role in the military environment during conflicts including World War I & II, Vietnam and Korea. However, due to an extended period of peacetime there has been a loss of institutionalised memory and capability decay of this nursing role.

Context
In the perioperative setting, every team member contributes to the safe and effective delivery of surgical care. Integrating PNSAs who are highly skilled, advanced practice nurses into the operating team provides the opportunity for optimising performance and flexibility. The PNSA has developed specialist skills and expertise proven to provide quality surgical care equivocal to a medical surgical assistant, with the advantage of insights and expertise into the perioperative nurse role. The PNSA has the flexibility to optimise staff workload and resource utilisation as their scope spans the perioperative continuum, including pre-operative assessment, intraoperative surgical assistance, and post-operative wound care.

Impact
The future of military healthcare is dynamic, requiring innovative approaches to maximise existing resources and enhance capability in challenging and continuously evolving environments. Nurses are essential to the functioning of healthcare systems globally, and in the military, they play an equally pivotal role. To meet the demands of this dynamic setting, military nurses must be supported to work at the top of their scope of practice. This will facilitate strengthening and extending the capability and capacity of healthcare delivery in the military environment. PNSAs have demonstrated their ability to enhance operating capability in civilian settings by performing surgical assistant roles traditionally carried out by medical doctors.

Outcome/Significance
Empowering military nurses to adopt advanced practice roles such as the PNSA can directly enhance surgical readiness, support operational effectiveness, and strengthen the overall capability of military health services. Finally, increasing awareness of PNSAs may facilitate the realisation of the benefits associated with their integration into military healthcare capability.

MCAT, MERT, JECC? Developing Platform Agnostic Critical Care Retrieval Training in the ADF

CMDR Scott Squires[1], GCAPT Adam Storey, WCDR Allan Turner

1 RAN, Sydney, Australia

Biography:

CMDR Squires is the DCS of MOHU. He is an Emergency Physician and has deployed extensively to the Middle East and Asia Pacific Region.

GCAPT Storey is the DCS of HSW. He has extensive experience in aviation, hyperbaric and operational medicine. GCAPT Storey is one of the senior instructors on the RAAF MCAT course.

WCDR Turner is presently posted to the RAAF HOCU. He is an Emergency Physician with extensive operational experience and is a senior MCAT instructor

Timely evacuation of casualties is one of key components of battlefield medicine and one of the most challenging, especially in non permissive environments.

In critically unwell patients, damage control resuscitation should occur as far forward as possible and there needs to be a means to be retrieve these casualties to a higher echelon of care.

For such casualties, Retrieval teams should be appropriately trained in both critical care and austere medicine.

At present in the ADF, the RAAF MCAT (Military Critical Care Aeromedical Evacuation Team) Course is the only course which trains and certifies team members to be able to provide a critical care retrieval capability (fixed wing). This is largely for Strategic AE.

There is no equivalent training for Forward or Tactical rotary wing or land based retrieval.

A small number of ADF Medical Officers and Nursing Officers have undertaken Rotary Wing Critical Care training by completing the UK MERT (Medical Emergency Response Team) course and the US JECC (Joint En-route Care Course). There is no ADF certification process for these courses that then leads to a cadre of personnel, unlike MCAT.

This presentation aims to review the requirement for critical care Retrieval in the ADF and explores whether a MCAT model could be applied to rotary wing and land based retrieval training and certification. It further explores the feasibility of such training compared to other models such as MERT and JECC and whether there could be a platform agnostic training model for critical care retrieval in the ADF.

Medical Decision Making in LSCO – Are We Prepared? An Overview of Modern Medical Ethics through a Clausewitzian Lens

MAJ Thomas Patterson[1]

1 ADF, Sydney, Australia

Biography:

MAJ Patterson is a medical officer in the ADF.

The provision of medical care in Large Scale Combat Operations presents myriad ethical dilemmas for both clinicians and commanders, many of which seem to be enduring features of war. At the crux of many of these dilemmas is an inherent friction between the conventional clinician-patient relationship and the overarching military objective. It is therefore an interesting philosophical primer to consider the medical ethical dilemmas inherent in large-scale warfare through the eyes of Clausewitz. This presentation seeks to articulate several enduring ethical dilemmas inherent to large scale combat operations and explores competing ethical scaffolds that may provide guidance to both clinicians and commanders in the future.

Mindfulness-Based Trauma Recovery and Prevention (MB-tr): A Community-Centred Adaptation of MBSR for Veteran Populations

Ms Lisa Brown[1]

1 Frontline Yoga, Coffs Harbour, Australia

Biography:

Lisa is a Registered Psychologist, Senior Yoga Teacher (Yoga Aust), Certified Mindfulness-based Stress Reduction Teacher (Brown University, USA), Insight Dharma Teacher (IMI) and Mindful Self-Compassion facilitator.

She teaches meditation and yoga regularly at Insight Meditation Retreats and as an Adjunct Lecturer at Charles Sturt University taught mindfulness and intensive retreats for post-graduate students.

Since 2008, Lisa has been facilitating Mindfulness-based Stress Reduction (MBSR) programs, the ground-breaking work of Jon Kabat-Zinn and colleagues at the University of Massachusetts Medical School.

In 2020 Lisa and her friend and colleague Kate Duncan adapted MBSR for trauma recovery and prevention for frontline workers (MB-tr) and continue to collaborate with Frontline Yoga delivering grant funded programs in Australia and overseas.

With a strong interest in the conjunction of western science, yoga, buddhadharma and earth-based wisdom traditions in health, prevention, healing and trauma recovery, Lisa has been practising meditation and yoga for more than 25 years.

Lisa also works in private practice in Coffs Harbour NSW and also provides clinical supervision and mentoring.

Originally developed by Professor Jon Kabat-Zinn at the University of Massachusetts Medical School in 1979, Mindfulness-Based Stress Reduction (MBSR) is widely recognised as the gold standard in mindfulness-based interventions. With over four decades of empirical research, MBSR has demonstrated significant benefits in reducing anxiety, stress, and emotional exhaustion, while improving overall wellbeing, self-agency, and quality of life.

Recent years have seen the emergence of trauma-sensitive adaptations of MBSR that respond to the unique needs of populations affected by trauma. Two notable programs developed from this evidence base include:

i) Openground's Mindfulness-Based Stress Reduction–trauma (MBSR-t)

ii) Frontline Yoga's Mindfulness-Based Trauma Recovery and Prevention (MB-tr)

This presentation focuses on MB-tr, a program co-developed in 2020 by Psychologist Lisa Brown and Firefighter Paramedic Kate Duncan, in collaboration with Frontline Yoga. Drawing on both clinical expertise and lived frontline experience, MB-tr integrates the foundational structure of MBSR with key trauma-sensitive adaptations. These include somatic-based yoga, guided relaxation, breathwork, self-compassion practices, and a three-day in-person immersive retreat.

Delivered over eight weeks via Zoom, MB-tr has been supported by government funding and has shown promising outcomes in pilot studies.

Independent research has highlighted statistically significant reductions in mental health symptomology, with average decreases of approximately 40% in both depression and PTSD symptoms. Participants also reported a 38% average increase in overall psychological wellbeing, with self-compassion, mindfulness, and interoceptive awareness all demonstrating substantial gains. Body listening improved by 115%, and trust in bodily signals increased by 77%.

Qualitative feedback reinforces these outcomes, with many participants reporting a transformation from hopelessness and chronic distress to renewed hope and personal agency. MB-tr offers a scalable, community-based intervention for improving mental health among veteran populations.

Future studies are recommended to validate these results with larger sample sizes and longitudinal follow-up.

Monitoring Low Level Blast Exposure to Personnel in Australian Defence Force Training

Dr Kurt Mudie[1], Dr Zoe Jenkins[2], Dr Antony Sutherland[3], WO1 Michael Kitcher[3], LTCOL Jessica Palling[3]

1 *Department Of Defence, Defence Science And Technology Group, Australia*

2 *Australian Department of Defence, Joint Health Command, Defence People Group*

3 *Australian Department of Defence, Australian Army*

Biography:

MAJ Anthony Sutherland MBBS, FRACP (Neurology)

Dr Antony Sutherland is a Cognitive and General Neurologist and Senior Medical Officer in the Australian Army. He works across both civilian and Defence healthcare, with a particular focus on traumatic brain injury, concussion, and the neurological impacts of repetitive low-level blast exposure in military personnel.

Clinically, Dr Sutherland is based in Melbourne, where he manages patients with complex cognitive, behavioural, and neurodegenerative conditions. He is also undertaking a part-time PhD at Monash University investigating the effects of low-level blast overpressure on brain health in Australian Defence Force members.

His research program combines exposure monitoring, neurocognitive assessment, and biomarker analysis, aiming to inform Defence health policy and improve monitoring, prevention, and management strategies for brain injury. This work directly aligns with recommendations from the Royal Commission into Defence and Veteran Suicide, supporting the development of a more comprehensive approach to brain health across the ADF.

Dr Sutherland has published widely in neurology and dementia, and regularly presents at national and international conferences. At AMMA 2025, he will present findings from Phase 1 of the blast overpressure study, the first systematic prospective study of its kind in Australia.

Background

The evidence for long-term health effects associated with repeated low-level blast exposure is emerging but further work is required to enable more definitive findings and recommendations. The magnitude and frequency of low-level blast exposure encountered by ADF personnel during training activities has not been systematically measured and quantified. The aim of this study was to establish an assessment protocol to measure low level blast overpressure exposure in Australian Defence Force (ADF) members during training, and monitor balance, neurocognitive function and acute mental health symptoms.

Methods

20 active duty Australian Defence Force members volunteered to participate over a 12-month training period during which they completed two weapons courses. Subjective blast exposure history was quantified as the Generalised Blast Exposure Value (GBEV) using the Blast Exposure Threshold Survey and in-training blast overpressure exposure

was assessed with BlackBox Biometrics (B3) Blast gauges (BlackBox Biometrics, USA). B3 Blast Gauges were issued to participants to wear on their combat ensemble for the duration of the trial to quantify peak blast overpressure (psi) and positive impulse (psi.ms) for each recorded exposure during training. Blast gauges were in sets of three, worn on the rear of the helmet, top of the shoulder strap of the body armour and front of the body armour. Balance, neurocognitive function, and self-report symptoms (Neurobehavioural Symptom Inventory (NSI), mental health symptoms of depression (Patient Health Questionnaire-9; PHQ-9), anxiety (General Anxiety Disorder Symptoms; GAD-7) and sleep (Pittsburgh Sleep Quality Index)) were collected at baseline, and repeated immediately after the completion of a heavy weapons course and advanced weapons course. A repeated measures ANOVA was used to compare differences in assessments across the three time points. Significance was set a priori at $p < 0.05$ for all statistical analyses.

Results

Subjective blast exposure history was 109,883.55 ± 264,835.49 (range 3658 - 1,186,600) GBEVs. Over the 12-month training period, the majority (93.86%) of peak blast overpressure exposures were below four psi. Over the two day heavy weapons course, trainees were exposed to an average of 4.5 (range 3 - 6) low level blast exposures, with an average peak blast overpressure of 6.55 ± 1.57 (range 1.99 - 13.45) psi, and a total daily positive impulse of 14.25 ± 9.27 (range 5.94 - 45.54) psi.ms. Over the 52 day advanced weapons course, participants were exposed to an average of 88.5 (range 33 - 159) low level blast exposures, with an average peak overpressure of 1.19 ± 1.14 (range 0.43 - 14.86) psi, and a total daily positive impulse of 5.09 ± 6.68 (range 0.14 - 41.19) psi.ms. The trainees demonstrated no change in balance, neurocognitive function or self-report symptoms of mental health over the three time points.

Discussion

Blast exposure was successfully recorded in trainees over a 12-month period. Participants commenced training with a range of cumulative blast exposure history and there was a range of within-trainee exposure to low level blast during training. There were no differences observed in balance, neurocognitive function or self-report mental health symptoms between baseline and post-heavy weapons or advanced weapons training. However, further longitudinal monitoring is necessary to determine cumulative exposures over extended training cycles and to understand any delayed onset of health effects. Larger sample sizes and additional dependent variables such as visual/vestibular assessments and blood and imagining biomarkers are required to investigate potential individual differences from blast exposure.

Moral Injury Skills Training (MIST): Past, Present and Future Dynamics for Addressing the Recommendations of the Royal Commission into Defence and Veteran Suicide

Chaplain (WGCDR) Assoc. Professor Lindsay B. Carey, CSM[1,2], Chaplain (WGCDR) Timothy Hodgson[3,4], WGCDR (Professor) Matthew Bambling[1,4], Dr. Nikki Jamieson[1], Dr. Melissa Bakhurst[4,5], Professor Harold G. Koenig[6]

1 *ADF Mental Health and Well-Being Branch, Canberaa, Australia*

2 *School of Psychology and Public Health, La Trobe University, Melbourne, Australia*

3 *Royal Australain Air Force, Edninburgh, Australia*

4 *University of Queensland, Brisbane, Australia*

5 *Education Directorate, ACT Government, Canberra, Australian*

6 *Department of Psychiatry and Behavioral Sciences, Duke University Health Systems, Durham, USA*

Biography:

Chaplain (WGCDR) Assoc. Professor Lindsay B. Carey, CSM, is Deputy Director of Research with the Directorate of Spiritual Health and Meaning (DSHM) within the ADF Mental Health and Wellbeing Branch. After 30 years of tertiary research and teaching, he is concurrently Associate Professor (Adjunct) with the Palliative Care Unit, La Trobe University, as well as the Institute of Ethics and Society, University of Notre Dame, Sydney, and the School of Sport, Health and Engineering, Victoria University, Melbourne. In 2018, 2019 and 2022, he was recognised as an Australian research 'Field Leader in Humanities' and co-awarded [with CHAP [WGCDR) Dr. Timothy Hodgson], the AMMA 'Weary Dunlop Award' (2019) for research into moral injury. He has served as a reservist chaplain at RAAF Williams, East Sale, Wagga Wagga and was a chaplain on Operation Sumatra Assist at Butterworth, Malaysia. In 2024 he was awarded the Conspicuous Service Medal (2024) for moral injury research and education. He has over 200 publications (articles, chapters and edited books) and is co-founder of the Speech Pathology Australia Palliative Care

Special Interest Group, as well as Senior Education Consultant with Cancer Education, Peter Mac Cancer Centre, Melbourne, Australia.

There is increasing evidence of moral injury and other moral problems being linked with suicidal behaviour (Jamieson et al, 2023; Khan et al, 2023). The Australian Royal Commission into Defence and Veteran Suicide also emphasised the importance of addressing moral injury, making a distinct recommendation for the Australian Defence Force and the Department of Veteran Affairs to "Prevent, minimise and treat Moral Injury" (Recommendation 78; RCDVS, 2024a, 2024b). The Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR] has been amended to include 'Moral Problems' comprising a spectrum of 'moral dilemmas', 'moral distress' and 'moral injury', in order to account for morally injurious experiences affecting veterans that may be relevant for the treatment of moral injury (APA, 2025).

This paper will present some of the key developments regarding moral injury and moral injury research. It will also detail two evaluations of the Moral Injury Skills Training program (MIST), which incorporated the Pastoral Narrative Disclosure (PND) strategy (Hodgson & Carey; 2024; Carey & Hodgson, 2018); both program and strategy were designed to educate, train and support those caring for military personnel and veterans suffering the impact of a moral injurious experience. The MIST program, developed by the ADF Directorate of Spiritual Health and Meaning (DSHM), has now been expanded to include training for community personnel who are likely to engage with veterans. 'Additionally, a number of British military personnel have also participated in the MIST program, which has also recently been presented to the NATO Science and Technology Human Factors and Medicine Program. Two evaluations have been conducted to assess MIST and PND from both military and civilian perspectives (Carey et al., 2023, 2025). The findings highlight the program's value in supporting military and veteran communities, reinforcing the importance of continuing MIST and PND within the ADF, and thus fulfilling the RCDVS recommendations.

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- RCDVS (2024b). 'Moral Injury' (Chapter 21). Health Care for Serving and Ex-Serving Members. Final Report Volume 4 (Part 5). Canberra: Royal Commission into Defence and Veteran Suicide, p. 357-379.

Moral Injury: Addressing Recommendation 78 of the Royal Commission into Defence and Veteran Suicide

Chaplain (COL) Charles Vesely[1] Chaplain (WGCDR) Lindsay B. Carey, WGCDR (Professor) Matthew Bambling, Senior Chaplain Andrew Watters, Dr. Melissa Bakhurst

1 Australian Defence Force, Canberra, Australia

Biography:

Chaplain (Colonel) Charles Vesely, BTh, MMin, Dip PS, Dip IOC, MAIES, MSCA, is the Director of the Directorate of Spiritual Health and Meaning, Mental Health and Wellbeing Branch, Australian Defence Force. CHAP Vesely has over three decades of service in operational pastoral care with fire and emergency services. He has served for 20 years as an Army Chaplain and completed tours of duty in Timor-Leste, Afghanistan, Middle East and Indo-Pacific. CHAP Vesely is a passionate adult educator having held a number of instructional postings, including the Chief Instructor/Commanding Officer of the Australian Defence Force Chaplains College. Prior to pastoral ministry, CHAP Vesely came from a law enforcement background. CHAP Vesely is a minister of the Uniting Church in Australia and a Level 4 (Strategic Leadership) Certified Member of Spiritual Care Australia.

The Royal Commission into Defence and Veteran Suicide (2024a, 2024b) gave clear recommendations to both the Australian Department of Defence and the Department of Veteran's Affairs with regard to Moral Injury: "Prevent, minimise and treat moral injury" (RCDVS, 2024a, RCDVS, 2024b; Recommendation 78). Recommendation 78 was divided into three parts, namely:

(a) implementing education, training and support programs with the explicit objectives of preventing, minimising and treating moral injury

(b) consider using the Moral Injury Outcome Scale [MIOS] or other tools, as the evidence base evolves, to support the early identification and treatment of moral injury.

(c) conducting or commissioning further research to better understand moral injury in the Australian military population.

This paper will present the work of the Directorate of Spiritual Health and Meaning (DSHM; ADF Mental Health and Wellbeing Branch), with regard to the already completed and ongoing strategies for addressing each component of Recommendation 78 as directed by the RCDVS. Overall, the current evidence affirms that the DSHM has been proactive in addressing moral injury within a constantly dynamic environment. Current and future DSHM approaches will be presented to strategically maintain (given appropriate resourcing) all three RCDVS moral injury objectives in collaboration with mental health and allied health practitioners.

Key References

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Operationalising Telemedicine in High-Risk Environments: Lessons from Aspen Medical's Deployments

Ms Laura Malceski[1], Dr Katrina Sanders[2]

1 Aspen Medical, Brisbane, Australia

2 Aspen Medical, Deakin, Australia

Biography:

Dr Katrina Sanders is the Group Chief Medical Officer at Aspen Medical, where she leads strategy, health system management, and governance across global operations. Her career spans the military, government, and private sectors, with expertise in clinical governance, system design, and the delivery of healthcare in challenging environments.

Dr Sanders is a Fellow of the Royal Australian College of General Practitioners and holds a Master of Public Health. She is also a Graduate of the Australian Institute of Company Directors and a Fellow of the Security and Health Executive Leadership Institute.

Her previous roles include Chief Medical Officer for the Australian Federal Police, with responsibility for national and international health services, and Senior Medical Officer in the Australian Army, where she gained extensive experience in military medicine, occupational health, and deployed operations.

Her current work focuses on the integration of virtual models of care into health system design. She contributes to the development of frameworks that support safe, effective, and sustainable healthcare delivery, and serves as Chair and Director on several boards.

Laura Malceski is the Director of Virtual Health at Aspen Medical, where she leads strategic transformation and operational excellence in digital healthcare delivery globally. With over 14 years of healthcare experience, she combines clinical expertise with advanced leadership capabilities to drive innovation in virtual healthcare services.

Ms. Malceski holds a Bachelor of Nursing from the University of Tasmania and is currently completing her Graduate studies in Leadership and Development through the Australian College of Nursing.

In her role, Ms. Malceski drives a virtual-first capability across all programs and business units, ensuring organisational uplift in digital health readiness. She oversees services for key national virtual workforce government infrastructure and has led the stand-up of virtual health services for clients. Her strategic leadership encompasses the integration of digital health platforms, stakeholder engagement with government partners, and maintaining high standards of clinical governance and compliance across virtual services.

Dr. Sanders is renewed for her expertise in strategic healthcare management, particularly in challenging and dynamic environments. She is a Fellow of the Royal Australian College of General Practitioners, has a master's degree in public health and is the recipient of two Australia Day Achievement Medallions in recognition of her contribution to healthcare.

The use of telemedicine has accelerated globally, offering new pathways to deliver care in challenging environments. However, the application of virtual health solutions in high-risk settings presents a unique operational and clinical challenge. This presentation draws upon evidence and lessons learnt from Aspen Medical's deployment of telemedicine in complex and high-risk environments.

Through case study analysis and reflection on operational models, the session explores the practical realities of implementing telemedicine in austere conditions. Unlike traditional in-person clinical deployments, virtual care in these environments requires deliberate planning, robust infrastructure, and tailored governance. The presentation will outline a structured framework for deploying virtual care models in high-risk contexts, highlighting enablers and barriers experienced across multiple deployments.

Key topics include:

- Human Factors and Workforce Readiness: Psychological screening, selection, and training of telehealth personnel, with an emphasis on telephony etiquette, cultural competency, and cognitive load management during prolonged virtual care delivery.
- Safety, Supervision, and Governance: Integration of telemedicine standards, including those outlined by the Australian Digital Health Agency and RACGP, and their adaptation for time-critical, high-risk operational contexts.
- Security and Privacy: Managing cybersecurity risks and protecting sensitive patient data in non-secure environments.
- Clinical Governance Innovations: Use of virtual debriefs, remote team huddles, mandatory check-ins, and wellbeing monitoring to ensure clinical safety, workforce sustainability, and quality assurance.

Evidence will be drawn from Aspen Medical's internal evaluations, clinical outcome data, and aligned literature, including WHO frameworks for digital health in emergencies.

Participants will learn:

- Practical considerations for the safe and effective use of telemedicine in high-risk environments.
- Key governance, workforce, and operational adaptations required to scale virtual care in austere or rapidly changing contexts.
- How national telemedicine standards can be flexibly applied to crisis-response settings.
- A structured approach to planning virtual care deployments that ensures clinical quality, data security, and workforce wellbeing.

This session contributes to the growing evidence base for virtual health in military and humanitarian settings and aims to inform policymakers, clinical leaders, and operational planners tasked with designing rapid, scalable health responses. By examining the interplay between standards, technology, governance, and human factors, this presentation advocates for a more nuanced and evidence-informed approach to telemedicine in high-risk settings.

Optimizing ADF Medical Officer Capability by Reducing Time to Fellowship - An Overview of Progress since Implementation of the PGY3 Year for RACGP Registrars

Dr Andrew Ramage[1]

1 RACGP, Brisbane, Australia

2 RACGP, Brisbane, Australia

Biography:

Dr Andrew Ramage is a GP working in Everton Park, Brisbane. He commenced working full time in civilian General Practice after retiring from the ADF as a Lieutenant Colonel having commenced his career as an infantryman and training as a General Service Officer before being sponsored through the Graduate Medical Scheme. He participated in Army's efforts to improve the progression of ADF Medical Officers through GP Fellowship. He is now supporting ADF GP training through the Royal Australian College of General Practitioners as a Senior Medical Educator in QLD.

General Practice training provides a broad training and experience base from which ADF Medical Officers can launch their careers in support of their respective Services. Fellowship in General Practice is an important milestone for ADF MO career progression and is a mechanism by which Joint Health Command and the Services (Navy, Army and Air Force) can be assured of a consistent, externally validated standard of education and training that provides a consistent baseline of competence and capability within the MO workforce. It also provides a curriculum against which Services and MOs can assess gaps in training for the specific military tasks the MO may need to be employed to perform, such as additional training in trauma and methods of casualty evacuation. Some of these gaps can be reduced in the later stages of Fellowship to RACGP through extended skills placements.

Historically, ADF GP Registrars have experienced delays in training completion due to the competition for time between their Service commitments and the GP training program. It was not unusual for an ADF MO to have training delayed for several years due to Service requirements taking precedence over College training requirements. This often resulted in frustration and disenchantment of ADF MOs and contributed to workforce attrition on completion of Return of Service Obligations (ROSO).

The Australian General Practice training system changed substantially in 2023 with transition from regional training providers to the Colleges (RACGP and ACRRM). Simultaneously, RACGP introduced a new requirement that all ADF Registrars must complete 12 months of civilian General Practice prior to progressing to GP Terms 3 and 4. Around the same time as these changes, there was a revision of ADF MO pay and conditions to modernize the ADF MO pay structure and make it more competitive with civilian remuneration opportunities. One element that changed as part of this review was the approval of a PGY3 clinical development year, allowing 12 months civilian General Placement to be achieved before ADF MOs were required to complete their military training and Return of Service Obligation. The combination of the PGY3 year and 12 months civilian General Practice was expected to facilitate more rapid progression through Fellowship, increase confidence of MOs in the general medical knowledge and skills, and reduce the likelihood of ADF tasks impacting negatively on GP training due to the increased flexibility in placement requirements for GP Terms 3 and 4. Overall, it was thought that the combination of changes in the GP training system, RACGP training requirements and pivotal change in employment conditions would result in an improvement in ADF Medical Capability through better trained MOs and more rapid progression to Fellowship and unsupervised practice in a military context.

This presentation will outline the impact of the changes in RACGP training requirements and implementation of the PGY3 clinical placement year on the progression of ADF MOs through the RACGP Fellowship training program. There will be some commentary on the observations of time to RACGP Fellowship and exam pass rates before and after the constellation of changes that have affected ADF RACGP Registrar training in the past 3 years.

Personalised Virtual Reality Positive Mental Enhancement (VRPME™): An Innovative Solution for Psychological Resilience in Isolated and High-Stress Military Environments. Findings from the Mars Society Arctic Analog Mission

Dr Stephane Verhaeghe[1]

1 Brain Vector, Sydney, Australia

2 University of Adelaide, Adelaide, Australia

Biography:

Dr. Stephane Verhaeghe's career reflects a rare fusion of precision, innovation, and a deep commitment to solving complex neurological challenges. Beginning as a pilot in the Belgian Air Force, he developed mastery over high-stakes systems and rapid decision-making.

After a few years at the Air Force, he requalified as a medical doctor in Belgium, using his experience as pilot to be part of aeronautic and space medicine research at NASA and CNES. His passion in neuroscience brought him to France for a specialisation as neurologist, conducting pioneering research on Parkinson's disease. This work exposed him to the urgent, unmet needs in underserved populations and sharpened his focus on advancing brain health for those most in need.

In Australia, Dr. Verhaeghe held leadership roles in the pharmaceutical industry, serving as Medical Director for neurological and rare diseases. There, he gained deep expertise in regulatory affairs, clinical trials, and the pathway to market experience that now ensures Brain Vector's solutions are developed with scientific integrity and real-world applicability.

Dr Verhaeghe is just back from a Mars analog mission near the North Pole where he tested Brain Vector technology to analog astronauts exposed to mentally and physically challenging environmental conditions.

Military personnel deployed in extreme, isolated, or high-risk environments, including remote outposts, submarines, forward operating bases, and long-duration flight operations, face elevated risks of psychological stress, loneliness, cognitive fatigue, and compromised wellbeing. As defence operations increasingly require resilience under isolation and uncertainty, innovative, portable interventions are needed to maintain mental health and operational effectiveness.

This study reports on the deployment of the Virtual Reality Positive Mental Enhancement (VRPME™) system during the Mars Society's Arctic Analog Mission, a simulation of Mars exploration on Devon Island designed to study the intertwined biological, psychological, and technical determinants of mission success in extraterrestrial-like conditions. The mission's isolation, environmental harshness, and communication latency make it a powerful analogue for both deep spaceflight and critical military deployments.

VRPME™ is an advanced, lightweight virtual reality intervention built for intensive field use. Its distinguishing feature is deep personalisation: Prior to isolation, each participant helps select and shape the immersive VR content, anchored in their own positive autobiographical memories (e.g., family celebrations, home landscapes, achievements, or specific supportive relationships). The system then delivers these hyper-personal, 2–3-minute multisensory sessions twice daily, designed to rapidly evoke positive affects, counteract stress and rumination, and restore focus, allowing users to reset mentally, even when physically cut off in adverse or monotonous environments.

In a controlled Arctic field study, participants using VRPME™ reported reduced feelings of loneliness and stress, greater emotional stability, and better sleep and cognitive performance. Qualitative feedback highlighted the profound value of personalisation: Users reported a tangible sense of connection, improved morale, and enhanced readiness to meet mission demands, effects not typically observed with generic VR or entertainment media. These data will be compared to control conditions, as measured by validated psychological instruments, cognitive tests, and physiological parameters.

The implications across the defence spectrum are significant. VRPME's portability, minimal logistical footprint, and adaptability support operational integration for soldiers, submariners, aviators, and command staff, as well as clinical and reintegration applications for veterans. By tailoring content uniquely to each individual, VRPME™ offers a scalable, evidence-based platform to mitigate psychological risks wherever personnel are isolated, under pressure, or lacking access to traditional support.

The Mars Society Arctic Analog demonstrates that technologically-enabled, personalised psychological support can be effective, accepted by users, and logistically feasible in the most challenging operational scenarios. VRPME™ stands poised to revolutionise mental resilience strategies across defence, sustaining the human element in the harshest environments on Earth and beyond.

Platelet Transfusions in a Military Context: Current and Emerging Evidence

Dr Elissa Milford[1,2,3,4]

1 *HQ 2 Bde, Brisbane, Australia*

2 *Intensive Care Services, Royal Brisbane and Women's Hospital, Herston, Australia*

3 *University of Queensland, Brisbane, Australia*

4 *Monash University, Melbourne, Australia*

Biography:

MAJ Milford is an early career clinician researcher. She is a practicing Intensivist, currently working at the Royal Brisbane and Women's Hospital, and is a full-time Intensive Care Specialist in the Australian Army as part of the Australian Defence Force's Medical Specialist Program. Her PhD was on the role of the endothelial glycocalyx in severe trauma, and she is now building a research program that spans the management of severe burns, trauma, blood transfusion, and endothelial dysfunction in critical illness. She also has a strong interest in the design of novel clinical trials and is currently completing a Master's in Biostatistics.

Platelet transfusions are commonly used in civilian practice. However, there are many evidence gaps and limitations of the available products. Currently available platelet products are challenging to supply in military settings.

Platelets intended for transfusion in Australia are currently donated via either apheresis or whole blood methods. The platelets are then suspended in a platelet additive solution, leucoreduced, and stored up to 7 days at 20-24C requiring constant agitation to prevent clumping and activation.

Platelets stored at room temperature have a longer post-transfusion circulating time than platelets stored at refrigerator temperatures (7-9 days vs 1-2 days). However, compared to cold stored (CS) platelets, this comes at the expense of reduced haemostatic function, shorter shelf-life, higher bacterial contamination risks, increased wastage, and reduced availability in rural, remote, and military settings. Room temperature (RT) stored platelets don't regain their full haemostatic function for approximately 24 hours post transfusion, whereas CS platelets have better haemostatic function immediately post transfusion. As the biggest users of platelet transfusions are the haematology and oncology population, and a longer circulating time is the priority for this population, RT platelets have been the sole product available for clinical use for the last ~50 years. There are several clinical trials underway to assess the clinical effectiveness of CS platelets and these may be available in the near future for clinical use.

Cryopreserved platelets can be stored at -80C for greater than 2 years, improving availability and enabling stockpiling. Small clinical trials in cardiac surgery and trauma suggest cryopreserved platelets are non-inferior to liquid-stored platelets, and these may also soon be available for clinical use. Lyophylised platelets offer even greater logistical advantages but are not yet ready for clinical use.

Other considerations include whether to use type-identical, type-compatible, or low-titer incompatible, washed or unwashed, pathogen reduced, and the choice of storage solutions.

The risks of platelet transfusions vary with the product and underlying pathophysiology. They include transfusion related lung injury, allergic and nonhaemolytic febrile reactions, infection from bacterial contamination, and immunologically mediated adverse effects.

The most relevant indications of platelet transfusions in a military context are in the general critically ill population and following traumatic injury.

Thrombocytopenia is common in ICU patients. Approximately 10% receive a platelet transfusion during their admission with the main indication being for prophylaxis, making ICU the second biggest user of platelet transfusions in civilian hospitals. However, observational studies and small clinical trials suggest that platelet transfusions are ineffective at preventing bleeding in this group when used prophylactically and are associated with an increased risk of poor outcomes including mortality, infections, and increased hospital length of stay, even after adjustment for potential confounders.

In trauma, the primary platelet abnormality is dysfunction, not thrombocytopaenia, with different phenotypes depending on the severity of the injury. Minor injuries result in an increased activation of platelets whereas severe injury results in reduced activation and aggregation. The effect of timing and dose of platelet transfusion in trauma is unclear but systematic reviews of trials of blood component ratios and observational studies suggest that there is a mortality benefit of high ratios (~0.6 to 1:1) of platelets to red blood cells, with a signal that the severer the injury, the greater the benefit, and harm in the less severely injured.

There are several recently finished, currently recruiting, and upcoming clinical trials that seek to address some of the evidence gaps in platelet

transfusion. These include the Threshold for Platelets trial, the Cryopreserved Versus Liquid Platelets, and trials of cold-stored platelets.

Preparedness and Resilience: Environmental Surveillance for Biosecurity and the Opportunities of Biomanufacturing

Dr Craig Rogers[1,2]

1 *DST Group, Adelaide, Australia*

2 *SABRE Alliance, Adelaide, Australia*

Biography:

Currently, Craig is Director of SABRE at DST Group, this role involves engagement and the leveraging of capability in the Australian Biotechnology sector and the wider scientific research ecosystem to assist in meeting requirements of the Australia Defence Force. Craig's background is a combination of science and business, where he completed a PhD in biotechnology in 2003, a post-doctoral position in the Department of Clinical Pharmacology at the Flinders Medical Centre, and an MBA in Technology Management.

Craig's other roles at DST have included Director of Science Translation, Director of the Technology Partnerships Office and Program Lead for the Small Business Innovation Research for Defence (SBIRD) program under the Next Generation Technologies Fund.

In a time of unprecedented global challenges, there is a critical need for robust preparedness and resilience mechanisms across Australia's biosecurity ecosystem. This abstract explores the versatile domain of environmental surveillance for biosecurity and threat detection, while highlighting the enhanced capabilities and opportunities presented by biomanufacturing. The convergence of these fields underscores the importance of cross-sector collaboration and the dual-use applications that can drive innovation and Australian national security.

Environmental surveillance serves as a key tool in Australia's biosecurity defence, enabling the early detection of biological threats through a variety of different diagnostic technologies. This proactive approach is critical in identifying potential hazards, ranging from emerging infectious diseases, effects of climate change, or the accidental or intentional release of toxic or pathogenic agents. By implementing a combination of advanced technologies such as genomic sequencing, remote sensing, modelling and data analytics, surveillance systems can provide real-time insights into potential threats which can then lead to timely interventions and mitigation strategies, enabling preparedness and resilience in Australia's national security.

The emergence of biomanufacturing has transformed the landscape of preparedness and resilience. This field manipulates the use of biological systems to produce a wide array of products, including rapid vaccine development, pharmaceuticals, food products and biofuels. The agility and scalability of biomanufacturing processes enable the rapid development and deployment of medical therapeutics in response to emerging health crises. For instance, the rapid development of vaccines during the COVID-19 pandemic is an example of the potential of biomanufacturing to address urgent public health needs. Additionally, the production of biofuels through biomanufacturing offers a sustainable alternative to fossil fuels, or the production of food products contributing to environmental sustainability, and also de-coupling Australia from the vulnerability of reliance of international supply chains.

The coordination of environmental surveillance and biomanufacturing necessitates a collaborative approach that spans across traditional sectoral boundaries. Cross-sector collaboration involves the alignment of objectives and outcomes of government agencies, academic institutions, industry (public and private), and international organisations. This collaborative framework fosters the exchange of knowledge, resources, and expertise, enhancing the ecosystems capability and capacity to respond to opportunities and threats. Additionally, the dual-use nature of technologies in these fields underscores their versatility and potential for broader applications and scale. For example, genomic sequencing technologies used in environmental monitoring can also be applied in personalised medicine or forensics, while biomanufacturing platforms can be adapted for the production of diverse bioproducts.

The interplay between environmental surveillance for biosecurity and the opportunities created by biomanufacturing underscores the importance of preparedness and resilience in the face of evolving global challenges. By embracing cross-sector collaboration and leveraging dual-use applications, we can enhance our ability to detect, respond to, mitigate and exploit biological threats and opportunities. This holistic approach not only safeguards public health and national security but also drives innovation and sustainability, paving the way for a more secure and resilient future.

Prevalence of War-Related Abuses and Mental Health Symptoms in Ukraine Since the Start of the War

Dr Lynn Lieberman Lawry[1], Dr Jana Asher, Olena Nesterova[2], Dr Olga Gvozdetska[2], Kimberly Boua[1], Vivi Mani[3], Kateryna Lund[1], Dr Judy Bass[4], Dr Paul Bolton[4]

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Biography:

Dr Lieberman Lawry is a physician, epidemiologist, and biostatistician with more than three decades of experience in humanitarian aid, disaster response, development, 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 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 conflict-related sexual violence (CRSV) 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. In addition, she developed interactive courses for international militaries who serve as Peacekeepers about the prevention of sexual exploitation and abuse and CRSV and as global health engagements for security cooperation in the human security space. Her course has been used in 48 countries.

Disclosure

This effort was awarded through contract HU00012420110 and is funded by Combat Casualty Research Program in accordance with Congressional direction to establish medical partnering with Ukraine specified in Sec. 736 NDAA 2023 and Sec. 721 NDAA 2024. The views and conclusions contained herein are those of the author(s) and should not be interpreted as representing the official policies or endorsements, either expressed or implied, of the U.S. Government or The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.

Background

Following the February 2022 full-scale invasion of Ukraine (UKR), and after more than a decade of war in Eastern Ukraine, reports of war-related abuses are reported by military members and civilians, although anecdotal. There are no prevalence studies to-date and much of the reporting of these abuses are only reported in "occupied territories", although it is well established that abuses increase in war. Without understanding the scope and the scale of the problem, it is impossible to plan for response, mental health support and rehabilitation for those who have suffered war-related abuses. As Ukraine grapples with the need for response and recovery, looking at human security indicators as part of Ukraine's National Action Plan will also lead to a better understanding of the strengths and gaps for post-war relief and recovery.

Objective

The goal of this 24-month study is to obtain nationally representative, population-based quantitative data to characterize the scope and scale of all forms of war-related abuses in Ukraine and mental health symptoms.

Methods

This cross-sectional study using structured interviews and questionnaires, conducted over a 8-week period in May-July 2025 is a complex, six-stage cluster sample of randomly selected household adults >18 years of age in 20 of 24 regions representing 33,000,000 persons in Ukraine. This study, administered by a local Ukrainian research organization, is a collaboration between the Center of Public Health of the Ministry of Health Ukraine and Uniformed Services University of the Health Sciences. Previously developed epidemiological instruments validated to assess war-related abuses were adapted for this study including the Mental Health Assessment Inventory; a Ukrainian validated inventory that includes a symptom assessment major depressive disorder, post-traumatic stress disorder, substance abuse, suicidal ideations and attempts, and traumatic head injury. Quantitative analysis is used to determine the rates and associations of war-related abuses, mental health symptoms and human security indicators.

Results
Of the 4228 respondents sampled, 58% were female with most living in urban and semi-urban settings. Nine percent of the respondents stated they were internally displaced. Respondents are mostly educated and married with 12% of the sample indicating they had military experience. More than seven million persons (22%) have a chronic health condition and 7% or 2.3 million persons reported a disability. More than 4 million persons (14%) have criteria for traumatic brain injury since the start of Russian aggression 2014 to present. Initial, unweighted data show a significant prevalence of mental health symptoms including depression (50%), anxiety (44%), post-traumatic stress disorder (4-8%), and substance abuse (47%). Nineteen percent of substance users stated it was due to war. Suicide attempts (2%) occurred among 660,000 persons in the sample. Agreement for human security indicators that map to the National Action Plan varied by sex. Conflict-related abuses were reported by respondents.

Conclusion
This is the first probability sampled and nationally representative study of mental health symptoms, conflict-related abuses and human security indicators in Ukraine. The knowledge gained from this assessment will provide not only valuable information to the Ukraine Ministry of Health (MoH) to improve the care for survivors of war-related abuses but also provide insights to inform current and future multi-domain medical operations for the U.S., NATO, and Ukraine.

Preventable Tropical Disease Threats in our Region

Dr Rebecca Suhr[1]

1 ADFMIDI, Arana Hills, Australia

Biography:

MAJ Rebecca Suhr is the current Research Medical Officer at the ADF Malaria and Infectious Disease Institute. Coming from a background of Close and General Health within Army, she is focused on communicating current research findings and disease surveillance information to actionable steps for clinicians and health planners.

Which infectious diseases have the potential to impact operational capability in deployed forces in SE Asia and the Pacific? Where are they found, how are they transmitted and what can we do as clinicians and health planners to protect our members and operational capability?

ADFMIDI clinicians will recap relevant preventable tropical disease threats to our forces. Historical example and current epidemiology will be discussed. Transmission routes and disease life cycles will be reviewed to highlight activities of risk and intervention means. Options and evidence for prevention, prophylaxis and/or eradication will discussed, with the aim to spread awareness of how to best protect our forces from these preventable diseases.

Process Evaluation of the University of South Australia's Invictus Pathways Program: The Early Years

Dr Dannielle Post[1], Professor Gaynor Parfitt[1]

1 University Of South Australia, Adelaide, Australia

Biography:

Dr Dannielle Post is an active researcher in the Veteran, First Responder, and Families space and an Executive Committee member of UniSA's Wellbeing for Australian Veterans, Emergency Services (WAVES) Program at UniSA. Experienced in the design, development, implementation, and evaluation of health promotion and behaviour change programs, Dr Post is also the Program Director of UniSA's Bachelor of Health Sciences (Public Health) program, and the Academic Program Coordinator of UniSA's Healthy Choices Community Program. Dr Post has a PhD in Population Health and is a Fellow of the Australian Mental Health Leaders Fellowship Program (2020 cohort).

Introduction
UniSA's Invictus Pathways Program (IPP), part of the Wellbeing for Australian Veterans and Emergency Services (WAVES) Program, is motivated by the spirit of the Invictus Games to mobilise the benefits of sport to aid physical, psychological, and social wellbeing. Originally developed to assist veterans to train for and participate in the Invictus Games in 2018, the scope of the IPP has expanded to support and improve wellbeing and facilitate post-traumatic growth and recovery among participants who are living with physical and mental health conditions.

The IPP component of WAVES is a student-delivered program, with supervised UniSA allied health placement students providing individually tailored, one-to-one training and support to participants.

Evaluation methods
Underpinned by a pragmatic approach, data related to participant and student involvement in the IPP, the number of participant training sessions, session attendance, program activities and events, and program fidelity were compiled from process documentation that had been collected between 2017 and 2020, inclusive.

Additionally, semi-structured interviews were conducted with participants of the IPP, as well as family members and university staff to understand operations of, and satisfaction with, the IPP. Interview data were analysed using reflexive thematic analysis. Coding and themes were developed through combined inductive and deductive analytical approaches.

Results
Between 2017 and 2020, 53 veterans had participated, or were still participating, in the IPP, and 63 allied health students had completed placements as student trainers. Fifty-three individual training sessions were delivered in 2017, increasing to 1,024 in 2020. There was high fidelity for the student-led exercise training aspects of IPP; however, data collection relevant to participants' psychological outcomes, and non-training IPP events and activities did not always occur as intended.

Thematic analysis of the seventy-one semi-structured interviews completed with IPP participants, family members and university staffs identified four higher order themes: Implementation and fidelity of the IPP, Satisfaction with IPP, Areas of IPP requiring improvement and suggestions for change, and Sustainability of the IPP. Satisfaction was generally high for the IPP, although there were factors that negatively impacted the experience for some participants and their family support network. Suggestions for improvement to program components and delivery aspects were made, including, transition approaches and structured ongoing program evaluation, and the precariousness of IPP funding and sustainability was raised as an ongoing concern.

Ongoing evaluation of the Program highlights the need to balance data collection requirements to reflect the impact of the program with the need to ensure limited burden on participants, and participants' reluctance to complete surveys, be involved in data collection, or give consent for use of their data.

Conclusion
The IPP has had a positive impact on the physical and psychological wellbeing of the veterans who participated in its initial stages. The process evaluation indicated that the IPP's physical activity training components were delivered with high fidelity and participant satisfaction, although there are areas that could be improved. Beyond this, there is an evident need to secure funding to support the sustainability of the IPP. Ongoing evaluation and program refinement continues as a means of supporting the wellbeing of veterans living with physical and mental health conditions, and their families; however, this is counterbalanced by the need to be mindful of participant burden and aversion to participate in data collection or provide consent to share data with evaluators.

Prolonged Forward Care - What Does This Mean and What Does It Look Like?

CDRE Anthony Holley[1]

1 Australian Defence Force, Brisbane, Australia

Biography:

Commodore Anthony Holley AM, RAN

BSc. MBBCh. DipPaeds. DipDHM. FACEM. FCICM, AFRACMA

Commodore Holley is a dual qualified Emergency Physician and Intensivist at the Royal Brisbane and Women's Hospital.

He is currently serving as the Principal Consultant Trauma to the SGADF.

CDRE Holley is an Associate Professor with the University of Queensland Medical School. He is a former ANZICS President (2019-22). During his tenure as President, he guided the critical care multidisciplinary professionals through the COVID-19 pandemic. He is a former examiner for the Fellowship of the College of Intensive Care Medicine of Australia and New Zealand. CDRE Holley has authored twelve book chapters, 58 peer reviewed publications. He is a senior Instructor for BASIC and an EMST course director. He is also a director of the Current Concepts in Critical Care course. CDRE Holley serves as a critical care representative for the Australian National Blood Authority in developing the Australian Patient Blood Management Guidelines. He has deployed on active service on multiple occasions, including two tours to Afghanistan, the Persian Gulf (HMAS Toowoomba), border protection, four tours to Iraq, Bushfire assist 2019/20 and as the Senior Medical Officer for the Operation COVID Assist Joint Task Group 629.3.

Prolonged Forward Care (PFC) incorporates best practices of traditional hospital-based management of serious casualties, designed to decrease both

mortality and morbidity in austere, prehospital operational settings, where ideal evacuation time is compromised. Military Medical Care Providers have a responsibility to plan, train and be prepared to modify the traditional paradigm.

In 2008, the US Secretary of Defence issued a directive that all military medical evacuation to forward surgical facilities must occur within a one-hour period. This initiative resulted in a reduction in time to surgery and was associated with a significant reduction in mortality. This strategy however, assumes evacuation within a short time frame is feasible. There are potentially multiple factors that may negatively influence the ability to effect an early evacuation – weather, distance and the combat environment. The operational situation, is changing and the multi-domain battlefield of the future, will not always offer optimal casualty care scenarios. There is a requirement to acknowledge that medical providers can no longer rely on the "Golden Hour" concept for presurgical care. The imperative may be to deliver care for days rather than hours, in a forward location. Long evacuation times to damage-control surgical capabilities will increase the need for medical personnel and en-route care providers to deliver prolonged advanced emergency medical care as close to the front as possible.

PFC is not intended as a replacement for a critical care or surgical teams, but rather as a model that enables medical care providers to deliver austere critical care far forward, to the best of their abilities, with inevitably limited resources.

The delivery of PFC mandates advanced training models to concentrate on the principle causes of preventable battlefield mortality- exsanguination, airway compromise and pneumothoraxes. While therapeutic approaches to these conditions are already in place, there is a requirement to drive the required skills to the lowest possible level- the notion of "top of scope of practice". PFC also mandates the early delivery of blood and blood component therapy and effective use of remote health expertise via strategies such as telehealth. While the traditional model of care delivery across the echelons of patient care remains the gold standard, there is a requirement to re-engineer the delivery of sophisticated care. The development, preparation and training of small footprint surgical teams designed to function in the forward environment for protracted periods becomes an imperative.

Research and development of knowledge and material solutions is required to close these capability gaps and assure command of the best possible care delivery for soldiers, sailors and aviators.

Psychedelic-Assisted Therapy for Veterans: A Novel Approach to Healing Trauma Through Structured Retreat Programs

Dr Aileen Alegado[1]

1 Mindset Consulting Psychology, Sydney, Australia

2 Evolution Medicine Enhanced Therapy, Northern Beaches Hospital clinic, Frenchs Forest, 2086

Biography:

Dr. Aileen Alegado is a clinical psychologist and Director of Mindset Consulting, a boutique private practice in Sydney CBD with over 15 years of experience specializing in mental health treatments and complex psychological presentations.

In her practice, she works with veterans as well as high achievers dealing with burnout, relationship issues, trauma, and stress. She also serves as a consultant clinician at Evolution Medicine Enhanced Therapy (MET) clinic at Northern Beaches Hospital, providing psychedelic-assisted therapy for PTSD and treatment-resistant Depression.

She is the founder of Envision Wellness Retreats, pioneering immersive therapeutic programs that integrate evidence-based psychological approaches with holistic practices in retreat settings. Dr Alegado combines expertise in Schema Therapy, CBT, and ACT with a neuroscience-informed approach to trauma healing. Her background in neuropsychological assessment enhances her understanding of trauma's impact on cognitive and emotional functioning. This year she's offering Australia's first 'overground' psilocybin-assisted wellness retreats in Portugal, focusing on creating meaningful and transformative experiences.Throughout her diverse professional endeavors, she maintains a commitment to ethical, evidence-based practice while embracing innovations that expand the possibilities for healing and human flourishing.

Her presentation draws from her specialized training, clinical experience, and innovative approach to retreat-based therapy programs designed specifically for trauma recovery

The global burden of mental health conditions among military veterans continues to present significant challenges to healthcare systems. Despite advances in conventional treatments, many veterans suffering from post-traumatic stress disorder (PTSD), depression, and substance use disorders experience limited relief. This presentation examines the emerging research on psychedelic-assisted therapy as a promising intervention for treatment-resistant

conditions in the veteran population, with a specific focus on developing safe, legal, and therapeutically sound retreat programs.

Psychedelic medicines, including psilocybin, MDMA, and ketamine, have a complex history in psychiatric treatment dating back to the 1950s. After decades of prohibition, rigorous contemporary research has demonstrated remarkable efficacy for these substances when administered in carefully controlled therapeutic settings. Phase 3 clinical trials of MDMA-assisted therapy have shown 67-88% response rates for chronic PTSD, while psilocybin has demonstrated significant anti-depressant effects with sustained benefits. Recent studies specifically focused on veterans have shown that psychedelic therapy can reduce suicidality, improve quality of life, and facilitate post-traumatic growth.

The presentation will review key findings from international research centres, including the ongoing work at Johns Hopkins, Imperial College London, and the Multidisciplinary Association for Psychedelic Studies (MAPS). Emphasis will be placed on the neurobiological mechanisms of these treatments, which appear to enhance neuroplasticity and facilitate the processing of traumatic memories through modulation of both the default mode network and emotional processing centers of the brain.

Building upon this foundation, the presentation proposes a comprehensive model for psychedelic therapy retreats that can be specifically designed for veterans. This model addresses the unique challenges of the Australian regulatory landscape while leveraging recent policy shifts that have created pathways for legal access to certain psychedelic medicines for treatment-resistant conditions.

The proposed retreat format integrates evidence-based protocols with holistic wellness approaches, including:

1. Careful medical and psychological screening to ensure safety and appropriateness
2. Preparation sessions focusing on intention setting and therapeutic rapport
3. Medically supervised psychedelic sessions with qualified mental health professionals
4. Structured integration sessions to process insights and experiences
5. Community-building elements that address the isolation often experienced by veterans
6. Long-term follow-up care and connection to ongoing resources

The presentation will detail practical considerations for implementation, including clinician training requirements, risk management strategies, and ethical frameworks to guide practice. Additionally, it will address potential concerns from the military medicine community and present strategies for building collaborative relationships with existing veteran support services.

As Australia moves toward regulated use of psychedelic medicines for mental health treatment, there exists a unique opportunity to develop specialized services for the veteran community. This presentation argues that retreat-based models offer advantages over traditional outpatient approaches by providing immersive healing environments, peer support, and comprehensive care integration - all factors that align with the specific needs of the veteran population.

The conclusion will emphasize the importance of rigorous evaluation of these novel treatment approaches, proposing metrics for measuring outcomes and mechanisms for continuous improvement of psychedelic therapy protocols for veterans. By combining cutting-edge neuroscience with compassionate, whole-person care, psychedelic-assisted therapy retreats represent a promising frontier in addressing the complex mental health needs of those who have served.

Psychosocial outcomes for Australian Defence Force veterans and family members during military to civilian transition: Insights from the *Families in Transition* study

Ms Amber B. Cohen[1,2], Dr Emina Prguda[2], Emeritus Professor Justin Kenardy[1,2], Professor Nicola T. Fear[1,3], Dr Andre Tan[1,2], Dr Michael Lam[2,4], Dr Camila Guindalini[1], Dr Mark Westby[1], & A/Professor Miranda Van Hooff[1]

1 *Gallipoli Medical Research, Brisbane, Queensland Australia*

2 *The University of Queensland, Brisbane Queensland, Australia*

3 *King's College London, London, United Kingdom*

4 *Queensland Centre for Mental Health Research, Brisbane Queensland, Australia*

Biography:

Ms Amber Cohen is a Research Coordinator with Gallipoli Medical Research's Department of Veteran Mental Health and an Adjunct Fellow with The University of Queensland's Faculty of Health, Medicine and Behavioural Sciences. With qualifications in psychological science and criminology, Ms Cohen is skilled in applied quantitative and qualitative research methodologies and has a keen interest in mental health. At Gallipoli Medical Research, Ms Cohen is involved in research investigating psychosocial outcomes during the military to civilian transition, the impacts of military service on family members' wellbeing, and trauma-related nightmare distress in veterans with posttraumatic stress. With lived experience as the family member of current and ex-serving Australian Defence Force personnel, Ms Cohen proudly contributes to high-impact research that delivers meaningful support to Australia's military and veteran community.

Background

Military to civilian transition involves various psychosocial changes, which can present challenges for Defence Force personnel reintegrating into civilian life. While emerging research acknowledges that transition-related challenges can extend to veterans' families, family members' unique perspectives remain underrepresented in research and service provision. Improving health and wellbeing outcomes for the entire family is crucial for developing supports that address dynamic needs during transition. We aim to explore key risk and protective factors for transitioning Australian Defence Force (ADF) families using preliminary data from the Families in Transition study.

Method

As of June 2025, a multi-perspective online survey was completed by 110 family members (27 parents [M_{age} = 63.07 years, SD = 6.25], 74 partners [M_{age} = 47.19 years, SD = 10.37], and nine adolescent children aged 12 to 18 years [M_{age} = 14.78 years, SD = 1.99]) of transitioning current and ex-serving ADF members as well as 82 veterans (M_{age} = 47.40 years, SD = 12.80) who transitioned within the last 10 years. Overall, 63.4% of veterans were male, while most parents (96.3%), partners (95.9%) and adolescents (77.8%) were female. 16.4% of family members reported on current serving and 83.6% reported on ex-serving ADF members. Veterans had an average service length of 20.16 years across the Navy (25.6%), Army (46.3%) and Air Force (32.9%). Participants completed measures of mental health (DASS-21/Y), family functioning (FAD-GF), and protective factors (PFRS).

Results

Veterans reported moderate to severe depression (37.8% scoring above DASS cut-offs), anxiety (41.5%), and stress (39.0%). Among family members, parents reported highest rates of moderate to severe depression (37.0%) and anxiety (25.9%), while more partners (24.3%) and adolescents (44.4%) reported stress in this range. Only stress differed significantly across cohorts (p = .001, η^2_p = .079), with veterans scoring significantly higher than parents (p = .036), and adolescents scoring significantly higher than parents (p = .003) and partners (p = .026). Unhealthy family functioning was reported by 54.9% of veterans and 43.6% of family members. Family functioning, irrespective of cohort (veteran or family member), was significantly related to mental health (p < .001, η^2_p = .099). Specifically, unhealthy family functioning was associated with higher depression (p < .001, η^2_p = .098), anxiety (p < .001, η^2_p = .057), and stress (p = .002, η^2_p = .051).

Protective factors for resilience were significantly associated with psychological wellbeing (p < .001, η^2_p = .322), specifically lower depression (p < .001, η^2_p = .321), anxiety (p < .001, η^2_p = .163), and stress (p < .001, η^2_p = .175). Stratified analyses by family member type (excluding adolescents due to sample size) identified cohort-specific protective factors. Personal resources were strongly associated with reduced psychological distress in veterans (p < .001, η^2_p = .313), including depression (p < .001, η^2_p = .299), anxiety (p = .004, η^2_p = .100), and stress (p = .006, η^2_p = .092). For parents, personal resources (p = .004, η^2_p = .463) and family resources (p = .020, η^2_p = .369) showed significant multivariate associations with mental health; however, only personal resources had a significant univariate relationship with anxiety (p = .024, η^2_p = .202) and stress (p = .004, η^2_p = .314). For partners, peer resources were significantly associated with mental health (p = .004, η^2_p = .175) specifically lower depression (p = .029, η^2_p = .066) and stress (p = .032, η^2_p = .064).

Conclusion

These findings support the need for tailored resources that holistically support transitioning families while leveraging each family member's unique strengths. There is potential to address unhealthy family functioning and strengthen personal and social protective factors to improve psychosocial outcomes during and post transition.

Rapid Extrication of Poly-Trauma Patients from Military Armored Vehicles: An Inter-Agency Trial of Lessons Learned

Mr Robert Curtis[1]

1 1 Health Battalion, GREENWOOD, Australia

Biography:

Rob Curtis joined the Royal Australian Army Reserve in 2021 as a Combat Paramedic, inspired by the Australian Defence Force's critical role during the 2019 bushfires and flood emergencies in North-Western Australia. In 2024, he received the CF Marks Award for "clinical and soldiering excellence, capability improvement initiatives, and outstanding contribution to the RAAMC."

He is currently employed as a Clinical Lead Paramedic with St John WA (SJA). Since joining SJA in 2015, Rob has held multiple leadership and instructional roles, including District Manager, Paramedic Training Officer, Station Manager, and on-road mentor for new Ambulance Officers and paramedicine students.

Rob holds a Bachelor of Science (Paramedicine) from Curtin University (2019). His professional interests extend beyond emergency pre-hospital care to include occupational health and safety, with a focus on manual handling and injury prevention. He later completed a Diploma in Occupational Health and Safety, specialising in musculoskeletal biomechanics. Rob has led several manual handling initiatives at St John WA and was instrumental in developing a training program aimed at reducing physical injuries during patient movement.

Outside of work, Rob is recently married to his wife Melissa and is a proud father to two young children—Jasmine (6) and James (4)

Background

Epidemiological data from modern conflict zones indicate that 87.3% of trauma-related fatalities occur prior to arrival at a facility capable of delivering damage control resuscitation (Eastridge et al., 2012). Of these deaths, over 25% are classified as potentially survivable (Furlan, Gulasingam & Craven., 2019; Shenoy & Kim, 2013), yet patients often fail to reach definitive surgical care due to delays in extrication and evacuation.

Despite the critical importance of timely access to surgical intervention, innovation in casualty extrication techniques—particularly in the pre-hospital tactical environment—remains limited. This study presents two novel methods for the rapid extrication of polytrauma casualties from Protected Mobility Vehicles – Medium (PMV-M) in scenarios involving inoperable rear door access, typically resulting from improvised explosive device (IED), mine strikes, or obstruction. The goal is to reduce pre-hospital time, improve clinical outcomes and reduce the incidence of musculoskeletal disorders (MSD) among rescue personnel to maintain capability and combat readiness.

We collaborated with Special Operations Paramedics from St John Ambulance WA to develop new armoured vehicle extrication methods, drawing on current best practice and a comprehensive literature review including the UK's EXIT Project. This project emphasised rapid extrication and transport of poly-trauma patients over strict C-spine immobilisation to reduce preventable deaths (Nutbeam et al., 2021; Nutbeam et al., 2022). Together, we developed and trialled techniques that balance speed, safe airway management, acceptable C-spine protection, and the safety of both casualties and rescuers (Nutbeam et al., 2022; Chatfield-Ball et al., 2015).

Methods

This study evaluated the feasibility and efficacy of adapting a civilian-derived technique that uses lightweight, low-cost "Rigging Straps"—referred to here as Patient Lifting Straps (PLS)—currently employed by Special Operations Paramedics and Firefighter Urban Search and Rescue teams. The technique facilitates rapid vertical casualty extraction through the gunner's hatch when rear vehicle access is compromised.

Australian Defence Force (ADF) pre-hospital clinicians—including Medical Technicians and Combat Paramedics—were timed while performing extrications using two methods: the standard Kendrick Extrication Device (KED) and the proposed PLS technique. The primary outcome measured was the time taken to complete the extrication—from the driver's seat to achieving full patient access on the vehicle roof.

The second method involved the removal of the ballistic windscreen to facilitate casualty egress in cases of confirmed neurological deficit. While more time-consuming, this approach enables complete spinal immobilisation and may be appropriate in select clinical scenarios.

Results

The PLS-based method demonstrated a consistent and statistically significant reduction in extrication time, with an average time saving exceeding 5 minutes per serial compared to the KED approach. In multi-casualty vehicle incidents, these efficiency gains

compound and offer a substantial reduction in time spent in the pre-hospital phase, and subsequently could reduce morbidity and mortality by expediting access to advanced surgical care.

Moreover, the PLS technique offered improved ergonomic conditions for rescuers, particularly during vertical extrication via the gunner's hatch, due to enhanced leverage, extended strap length, and optimised rescuer body mechanics.

The versatility of the PLS system would also allow seamless integration into the TCCC continuum, enhancing rapid patient movement while improving survivability and section lethality during tactical extractions.

Conclusion

Based on these findings and with the endorsement of the St John Ambulance WA Special Operations Division, we recommend establishing a formal, evidence-informed extrication project to explore adapting these methods across the ADF vehicle fleet.

By reducing pre-hospital time intervals, enhancing rescuer safety, and maintaining tactical effectiveness, the proposed approach offers a low-cost, high-impact solution to improve survivability in complex battlefield environments.

This project should incorporate modern civilian extrication methodologies and focus on armoured vehicle platforms currently in ADF service. This crucial collaboration with civilian SME's underscores the ADF's strategic goal of 'Shaping the Strategic Environment' and addressing 'Military Healthcare in a Dynamic Environment'.

Rapid Medical Supply Delivery

Dr Joni Sytsma[2], Professor Pauline Pounds[3], Mrs Amany Wahba[1]

1 *Saab Australia Pty Ltd, Mawson Lakes, Australia*

2 *Outer Loop Engineering, Brisbane, Australia*

3 *University of Queensland, Brisbane, Australia*

Biography:

Dr. Joni Sytsma is an experienced aerospace engineer and innovative leader who transitioned from the USA to become an Australian citizen in 2022. With a comprehensive academic background, holding a B.S., M.S., and Ph.D. in Aerospace Engineering from the University of Florida, she has dedicated over 18 years to advancing aerospace technologies.

Her career includes significant contributions at the United States Air Force Research Laboratory, where she developed early weaponized drone systems and worked on hypersonics.

In Australia, Joni has held key technology leadership roles at Gilmour Space Technologies, developing software for space rockets, and at the counter-drone company Department 13. Currently, as the Chief Executive Officer at Outer Loop Engineering, Joni leads the technological advancements for a range of drone projects set to take flight in the coming months. Her extensive experience in research, development, and commercialization of complex aerospace systems uniquely positions her to navigate the intersection of hardware, software, and physics to create impactful solutions.

Beyond her technical expertise, Joni is also a strong advocate for diversity in aerospace and the application of advanced manufacturing techniques.

The critical need for immediate access to lifesaving pharmaceuticals and blood products at the Point Of Injury (POI) in defence operations is a well-established challenge. Current reliance on the 'Cold Chain' logistics model, utilising portable refrigerators through transport, introduces significant time delays in delivering these essential resources. This often necessitates transporting casualties to established forward medical facilities, impacting survival rates, treatment efficacy, and recovery times. The staged deployment from Brigade Support Platoons to forward surgical teams, while necessary, further compounds these delays, particularly in reaching the isolated medic treating the initial trauma. While resupply to close health facilities is manageable, the timely delivery to the POI remains a bottleneck, often reliant on aircraft availability or small refrigerated units on ambulances. This highlights a crucial opportunity to minimise the time between injury and the delivery of critical medical interventions, potentially reducing the logistical footprint of forward elements and expanding their access to a wider array of treatments on demand.

Addressing this critical gap, dedicated researchers at the University of Queensland (UQ), in collaboration with Outer Loop Engineering (OLE) and defence prime and sovereign systems integrator Saab Australia, are developing a high-speed drone based on OLE's innovative electric missile technology. This project directly tackles the challenge of ultra-rapid delivery, aiming for a 72-second transit time to a POI located 5 km away. The core focus is the immediate delivery of temperature-sensitive medical supplies, with the ambitious goal of minimising or eliminating the need for traditional cold-chain management for these critical initial response windows. OLE is manufacturing the high-speed drone and working

closely with Saab Australia to ensure seamless integration of a temperature-managed payload bay and secure, rapid deployment mechanisms for blood and pharmaceutical delivery systems. Concurrently, UQ researchers are developing advanced flight control algorithms to guarantee the speed, accuracy, and reliability of these time-critical missions. Initial investigations are also exploring the feasibility and impact of extending the drone's operational range to 30 km and beyond, further amplifying its potential to revolutionise battlefield medical logistics. This novel tube-launched, high-speed drone delivery system offers a solution to the enduring challenge of timely medical resupply at the most critical point of need, promising to significantly enhance the survivability of personnel in high-threat environments.

Repeated Exposure to Low Level Blast: Review of the Current Understanding of Associated Neuropathology, Cognitive Effects, Strength of Evidence for Longer Term Health Effects and the Defence Approach to Management

Dr Catherine Kelaher[1], BRIG Damien McLachlan

1 Joint Health Command, Campbell Park, Australia

Biography:

Dr Cath Kelaher is the Senior Medical Advisor in Occupational Medicine at Joint Health Command. She is a consultant occupational and environmental physician with extensive experience advising Defence and government on risk management of occupational exposures and management of complex health issues.

Her recent work has focused on evaluating the evidence base for low level blast (LLB) exposure and its potential acute and long term health effects in military settings. Dr Kelaher brings a multidisciplinary lens to the emerging science around LLB, bridging clinical, regulatory, and systems-level perspectives.

Dr Kelaher is a member of the Australasian Faculty of Occupational and Environmental Medicine (AFOEM) and an advocate for evidence-based practice and precautionary health policy in Defence and the Australian New Zealand Society of Occupational Medicine (ANZSOM) and EnHealth.

Brigadier McLachlan joined the Army in 1992. He has a broad experience in command, engineering and staff appointment across Defence. Brigadier McLachlan has a Bachelor of Science with Honours from Monash University, a Bachelor of Engineering with Honours and a Masters of Systems Engineering from the University of New South Wales.

Brigadier McLachlan is the inaugural Director General Landworthiness. The remit of the Branch includes Work Health and Safety – Army, the Land Test and Evaluation Agency, the Directorate of Engineering – Army, Directorate of Landworthiness Support and the newly formed Land Accident Investigations Bureau.

In 2024, he was asked by Chief of Army to lead the response to the Royal Commission in Defence and Veterans Suicide 'recommendation 61 – establish a brain injury program'.

Blast injuries were considered the 'signature' injury of the Middle East Are of Operations. There has been extensive research into high level blast exposure and the associated health effects have been well characterised. Repeated exposure to lower level blast is increasingly being recognised as an occupational hazard of concern in military environments.

Unlike high level blast, where exposure is limited largely to the operational space, repeated exposure to low level blast (rLBB) is a very common exposure in training environments and may result from an array of training activities including breaching activities, small arms fire, or mortar and artillery emissions. Repeated exposure to low level blast has been found to cause transient cognitive changes that may affect safety and function and there is concern that exposure rLBB may contribute to longer term changes in cognition.

This issue was highlighted by the Royal Commission into Defence and Veterans Suicide and Recommendation 61 of the Final report recommended the establishment of a brain injury program in order to improve our understanding of rLBB exposure, of the potential associated health effects, and which also improves our ability to identify, assess and manage neurocognitive issues.

This presentation will introduce the topic and explore the current state of evidence regarding rLBB in terms of the underlying neuropathology, and the acute and long term health effects. It will highlight the current issues and gaps in the research. It will also discuss Defence activity to improve our understanding of rLBB exposure, manage risk and minimise exposure to best protect our members.

Resilient Healthcare – Minimum Viable Capability in Clinical Governance

AIRCDRE Andrew Johnson[1], GPCAPT Joleen Darby

1 Joint Health Command, Canberra, Australia

Biography:

Currently serving as a Director within the Office of the Deputy Surgeon General, Joint Health Command. GPCAPT Darby is involved in projects relating to clinical governance reform and the new Health Knowledge Management system (HKM). Previously, GPCAPT Darby held prominent roles including Chief of Aeromedical Evacuations, Commanding Officer of the Institute of Aviation Medicine (IAM).

AIRCDRE Johnson is currently serving (SERCAT5) in Joint Health Command as Principal Consultant to the Surgeon General of the ADF for Force Health Protection. He is leading the Review of Clinical Governance in the ADF – Project Best. Previously, AIRCDRE Johnson has served in senior roles in Queensland Health, NSW Health and the private hospital system. He is an Honorary Professor at Macquarie University, and formerly a full Professor at James Cook University. He is a Distinguished Fellow of the Royal Australasian College of Medical Administrators (RACMA) and has chaired or been a member of several statewide and national Boards and Committees. AIRCDRE Johnson has published several book chapters and peer reviewed articles and presented at dozens of national and international meetings and conferences.

Background/context
We live and work in an increasingly complex and dynamic global strategic environment, requiring greater agility and preparedness from Defence Forces. Ensuring that the Australian Defence Force has a high quality, effective, and resilient health system is essential to support Defence's mission in defending Australia and its national interests.

Objective/purpose
Clinical governance is central to providing the best outcomes for patients. It is the combination of culture, systems and processes that enables everyone in a health service to deliver care that is consistently high quality and improving.

It is the system by which boards, executives, clinical leaders and the workforce are accountable to patients and the community for providing high-quality care – care that is person-centred, safe, effective, accessible and integrated, in a health system that is equitable, efficient and sustainable. (Australian Commission on Safety and Quality in Healthcare 2025)

The Defence context for clinical governance is unique in that the process is both a mechanism to assure good clinical care for the individual and to assure minimum viable capability for Defence Health to be an effective enabler of delivery on the Defence mission.

Design/methodology/approach
The Surgeon General Australian Defence Force (SGADF) commissioned the Defence Health Clinical Governance Review to evaluate current clinical governance mechanisms and make recommendations as appropriate for improvement. SGADF's intent is to establish a contemporary, fit-for-purpose Clinical Governance Framework that articulates roles, responsibilities and mechanisms for clinical governance that provide assurance of Minimum Viable Capability for Defence Health as an enabler for the Defence mission, and safe and effective care for Defence members. The Review has been conducted with a series of site visits around Australia by a small Project team, to establish work-as-done at the clinical coalface. The team has considered contemporary practices, both within Australia and internationally to inform a framework for assurance of system resilience and a Restorative Just Learning Culture

The Review has been named "Project Best" (the Project) in recognition of the historic contribution of COL Kathleen Best to military medicine.

Findings:
The Project has identified that there are significant opportunities to enhance clinical governance in Defence Health. Extant mechanisms are at times inconsistent with contemporary and emergent evidence-informed practice. At times, governance work-as-done runs counter to the safe and effective delivery of care, for example, through encouragement of defensive clinical practices that offer potential for patient harm.

Limitations
Given the sensitive nature of the Defence security environment, the presentation will be limited to discussion at an unclassified level.

Research implications
Research implications are limited due to the difficulty in sharing sensitive information across jurisdictions due to security requirements.

Practical implications
Significant actions are recommended in the Project report to remove some of the barriers to effective governance and assurance, to align with contemporary safety science practices, and to advance towards a Restorative, Just and Learning Culture (RJLC). This will advance an environment of psychological safety, away from the perception of a "blame culture". Recommendations seek to reduce the prevalence of low-value governance activities, and to advance methodologies for "productive assurance", supporting effective service improvement, and "making the right thing easier to do."

Keywords
Resilient Healthcare, Defence Health, Clinical Governance

Responding to Moral Injury in a Dynamic Maritime Crisis

Senior Chaplain Daniel Hynes[1], Chaplain (WGCDR) Assoc. Professor Lindsay B. Carey, MAppSc, PhD, CSM, Rev. Dr Geoff Broughton, DipYthMin, MATheol, MA, ThM, PhD,

1 Department Of Defence, Campbell, Australia

Biography:

Senior Chaplain Dan Hynes has dedicated over 40 years to the Commonwealth Navy. Born in Ontario, Canada, he began his naval career in the Royal Canadian Navy, spending 14 years in various sea and shore roles before transferring to the Royal Australian Navy. He completed Principal Warfare Officer training and held key positions, including Executive Officer of HMAS STIRLING. Answering a call to ministry, Dan trained as a chaplain and was ordained in 2009. His chaplaincy assignments have taken him aboard multiple HMA Ships, and he later spent four years as Director of Spiritual Health and Wellbeing in the ADF Joint Health Command. Currently, he leads Joint Training Chaplaincy at the Australian Defence College. Dan and his wife, Mandy, recently celebrated 40 years of marriage and have two sons and two grandchildren.

The purpose of this paper is to examine the dynamic and traumatic environment which the Australian Government's 'deter and deny policy' (2001) created, with regard to the ill-fated refugee boat "SIEV 4". The paper will consider how this policy placed the health and wellbeing of crew members of HMAS Adelaide at risk of moral injury, particularly in light of the International Convention for the Safety of Life at Sea. The paper will initially provide a historical-political background to what became known as 'The Children Overboard Affair" (CHOA). It will then explore various theoretical perspectives for analysis, including the International Convention for Safety of Life at Sea, moral injury theory, the biopsychosocial-spiritual paradigm as well as pastoral theological viewpoints. A qualitative methodology will be used to examine CHOA public documents including both government and non-government sources. This will be conducted through the method of document analysis, using the specific techniques of critical analysis and thematic analysis to examine the collated data. The results of this paper will present both critical and thematical findings in relation to CHOA to explore the moral impact upon ADF members and their families and the potential role of chaplains in addressing the aftereffects of such traumatic experiences.

Reference

- Hynes, D. C., Carey, L. B., & Broughton, G. (2025). The Chaplain's Compass: Navigating Moral Injury and Companioning the Military Soul. Health and Social Care Chaplaincy. https://doi.org/10.1558/hscc.33582

Risk Factors for Progression and Chronicity in Suicidal Ideation and Behaviours in Contemporary Australian Defence Force (ADF) Personnel

BRIG Nicole Sadler[1]

1 Australian Defence Force, Majura, Australia

2 Phoenix Australia - Centre for Posttraumatic Mental Health, Melbourne, Australia

Biography:

Nicole Sadler is a Clinical Psychologist and the Director and Chief Executive Officer of Phoenix Australia – Centre for Posttraumatic Mental Health. She is also an Enterprise Professor within the Department of Psychiatry, University of Melbourne. For over three decades Nicole has worked with military members, veterans, emergency services workers, judiciary and frontline health care professionals, and communities impacted by disasters and large scale events. She is an expert in trauma-related mental health and wellbeing, suicide, and disaster mental health. She has led major mental health strategic reviews, research, and policy and training development projects for organisations across Australia and internationally. Prior to joining Phoenix Australia in 2017, she served in the full-time

Army for over 20 years and completed her career in the senior Army psychology position. She continues to serve in the Army Reserves at the rank of Brigadier as the Principal Consultant - Mental Health. Nicole has a strong record of accomplishment in setting and implementing strategic direction in mental health and personnel management within the Australian Defence Force, which was recognised with a Member of the Order of Australia in 2018 and a Conspicuous Service Cross in 2009.

Suicide risk is dynamic and multifactorial, making it difficult to predict who will or will not attempt suicide. This presentation outlines the key findings from a research project examining whether suicide prediction in an Australian military and veteran cohort could be improved by identifying factors associated with progression from reporting suicidal ideations only to reporting suicide-related behaviours (plans, attempts), and factors associated with chronicity of these thoughts and behaviours. Both progression and chronicity have been linked to heightened risk of subsequent suicide. The analysis built on the Defence 2010 Military Health Outcomes Program and the 2015 Defence and Department of Veterans' Affairs Transition and Wellbeing Research Programme. As the 2015 study included the follow-up of 2010 participants, data was matched across the two time points. Atheoretical approaches to data analysis were implemented through machine learning techniques, enabling multiple factors to be simultaneously and equally considered without assuming associations.

The findings of this exploratory research reveal that machine learning techniques can be used to predict, beyond chance, individuals who will report suicidal behaviours (with or without ideation), rather than suicidal ideation only at a single time point, as well as individuals who will report chronicity of suicidal ideations or suicide-related behaviours. The performance of the predictive models was comparable to, and in some cases superior to, traditional statistical techniques. The risk factors important in prediction are multi-factorial, spanning mental, physical and social health, as well as occupational and phenomenological domains. The analyses also highlight some distinctions between current serving personnel and those who have transitioned out of full-time service, indicating risk presentations may vary throughout different career stages. Active and passive suicide ideation are important predictors of suicide behaviours, alongside experiencing mental health symptoms and or physical health issues, particularly when they are perceived to negatively impact functioning. There is evidence of trauma and significant adverse life events, as well as military-related factors and attitudes, impacting escalation of risk and chronicity of suicidality. Importantly, many of the predictors are modifiable, or at least the severity of the impact could be modifiable, including potentially years earlier, and several are military specific.

The findings reinforce the necessity of early identification and comprehensive assessments for targeted treatment and interventions, not only for mental disorders, but also for individuals experiencing sub-syndromal problems, as well as physical health problems and or psychosocial stressors. This may prevent progression to more severe conditions and reduce the risk of subsequent death by suicide. The research implications extend beyond the healthcare system, to military, veteran, community service and support systems, particularly as there is a small but significant group of people at risk of suicide who do not interact with the healthcare system.

Strategic Aeromedical Evacuation as a Proxy for Medical Return to Australia Surveillance

SQNLDR Jordan Breed[1]

1 Directorate Of Air Force Health, Canberra, Australia

Biography:

SQNLDR Jordan Breed is a Public Health Physician and General Practitioner. He is currently posted to the Directorate of Air Force Health and is also supporting the establishment of the Joint Health Command Directorate of Force Health Protection. He has a strong interest in health surveillance and has extensive operational experience in Aeromedical Evacuation Operations.

Background

Medical return to Australia (MRTA) is the official term for medical repatriation of ill or injured personnel from ADF operations and exercises. Surveillance data on MRTA are critical to understanding how this affects the ADF population and capability. Strategic (STRAT) Aeromedical Evacuation (AE) is the primary means of achieving MRTA. Therefore, existing STRAT AE data provides a proxy for MRTA surveillance.

Aims

This analysis aimed to provide surveillance data on MRTA and STRAT AE to inform quality improvement for ADF health policy, practice and procedures relating to pre-deployment health screening, health support planning, and force health protection.

Methods
We conducted a descriptive analysis of the ADF STRAT AE database from 2012 to 2023 inclusive. We included all AE that were for ADF personnel on operations, exercises, or within the national support base (NSB). We manually coded free text entries for the diagnoses that resulted in AE into ICD-10-AM diagnostic categories. We then reported total numbers and proportions of these diagnostic categories and stratified these by service and activity type.

Results
2162 AEs were included in the analysis. Diagnostic categories could be coded for 93.8% of cases. The most common diagnostic categories resulting in AE were injury (31.0%), mental health disorders (25.7%), non-injury musculoskeletal disorders (11.7%), and digestive system disorders (7.9%). These were the top four diagnostic categories in all cases when stratifying for service across operations and exercises. However, there were some notable differences. Higher relative proportions of injury were observed on exercises (35.6%) compared to operations (30.0%) and for Army (38.0%) compared to Navy (29.3%) and Air Force (24.0%). Navy had the highest proportion of mental health AEs (25.8%) compared to Army (14.8%) and Air Force (21.8%). We provide hypotheses for these observations. NSB AEs were evaluated separately as they are not relevant to MRTA. Mental health was the most common reason for NSB AE (42.5%). This analysis was limited by the quality of pre-existing data and included variables and the lack of matched data on force size and composition.

Conclusions
STRAT AE provides useful MRTA surveillance data to inform force pre-deployment screening, health support planning, and force health protection. Injury, mental health, non-injury musculoskeletal disorders, and digestive disorders account for over three quarters of MRTA. Specific focus should be applied to optimise prevention, and early treatment of these conditions. A dedicated MRTA surveillance system should be developed to provide timely and comprehensive data to best inform policy, practice, and procedures.

Strategic and Operational Priorities for the Growth of Military Medicine

COL Tim Inglis[1], BRIG David Ward[1]

1 Directorate of Army Health, Brindabella Park , Australia

Biography:

COL Inglis is a professor at the School of Medicine, University of Western Australia and a Medical Microbiologist with the WA state pathology service. His operational service includes Op Solania and Op COVID-19 Assist. He is working with academic and ADF colleagues to develop a military medicine programme as a template for other Australian universities. His clinical interests include sepsis, antimicrobial resistance, deployable diagnostic methods, emerging infectious diseases and CBRN countermeasures.

Problem
The rapid deterioration of world order puts our Defence Force on notice, including our Health Reserve. Expansion of a relatively small Health Reserve has become a priority to support the increasing range and number of operational tasks. However, the civilian health workforce already competes for valuable medical, nursing and allied health professionals.

Solution
Recognising the need for a collaborative solution to recruitment and retention of the Health Reserve, and its training for a higher operational tempo, there is a good case for revisiting the role of universities and specialist colleges in building Health Reserve capacity. Lessons learned from previous local initiatives, and the impetus given by the two most recent strategic reviews have helped design a pilot university programme in military medicine.

Method
With resource pooling from Defence Force units and training institutions, and academic structure from universities, a civil-military programme is feasible at minimal cost to both sectors.

Progress
Preliminary stakeholder engagement accelerated course design process, with relevant educational milestones and professional incentives. The necessary underpinning will be provided by a further review of extant strategic policy, informed by best practice insights sourced from professional military medicine programmes overseas.

End state
Building up the Health Reserve beyond provision of health support to joint operations, to become a strategic asset in national defence, is an outcome worth striving for.

Stress, Resilience & Functioning: 8-Week Peer Led Program

Mr Colin Von Rechenberg[1]

1 Frontline Mental Health, Australia

Biography:

"Colin is a Navy Veteran with lived experience of mental health challenges and a strong commitment to supporting the wellbeing of those who serve. Since transitioning from the Military, Colin has worked in the Commercial Diving, Unexploded Ordnance Disposal and Mining industries around the world. He is now a Provisional Psychologist holding a Master of Professional Psychology, Honours and Bachelor Degrees of Psychological Science. He combines academic knowledge with lived experience. Colin has over 7 years' experience delivering group programs to Military personnel and First Responders, and he now serves as Lead Facilitator for the Stress, Resilience & Functioning program with Frontline Mental Health. Based in Tasmania but constantly on the move (often with his loyal companion, Lenny the Wonder Dog) Colin brings authenticity, insight, and dedication to his work.

Stress, Resilience & Functioning (SRF) is an eight-week, evidence-informed mental fitness program designed to build psychological resilience, promote emotional regulation, and improve functioning across the military, veteran, and first responder community. The program provides a practical, proactive framework for managing stress and enhancing performance in high-stress environments, and is informed by over a decade of research, clinical practice, and participant feedback.

The SRF program, developed by Associate Professor Jon Lane (Chief Psychiatrist, Department of Veterans' Affairs), originates from the STAIR model, which was first created as part of a PhD research project. This model later evolved into the GEARS program, which was formally evaluated during the Royal Commission into Defence and Veteran Suicide (2021–2023).

While SRF retains the foundational psychological principles, skills, and interventions of these earlier versions, it introduces significant refinements. Based on participant feedback and emerging research, the program has been streamlined from 12 weeks to 8 weeks to improve accessibility without compromising depth or outcomes.

A key addition is the Systematic Self-Reflection (SSR) model, which strengthens participants' capacity to engage with stressors in adaptive, longitudinally protective ways. SSR was tested on 226 Officer Cadets at the Royal Military College Duntroon (Crane et al., 2019) and has now been integrated into SRF to deepen the focus on emotion regulation and stress tolerance. Unlike earlier iterations, SRF targets resilience-building and functional adaptation, rather than recovery from psychological injury. This represents a shift from clinical, post-injury intervention models to a prevention and early intervention approach suitable for both current-serving personnel and veterans.

The eight-module curriculum covers:

1. Foundations of Stress and Resilience
2. Understanding Emotions
3. Understanding Values
4. Emotional Regulation
5. Service Culture & Conditioning
6. Psychosocial Supports
7. Interpersonal Relationships & Boundaries
8. Sustaining the Practice

Each module includes psychoeducation, applied strategies, and reflective exercises.

Delivery is supported by a custom-built Learning Management System (LMS), which offers weekly resources, video content, transcripts, and audio descriptions to support varied learning needs. The LMS also allows for asynchronous engagement and ongoing access to materials, making it ideal for operational environments with unpredictable schedules.

The SRF program has been delivered across a range of service settings. Open Arms (Tasmania) piloted a Train-the-Trainer model for peer and clinical staff, while current-serving Army personnel at the School of Military Engineering (SME) participated during their Initial Employment Training cycle. In both cases, the program was highly rated by participants and staff. Additionally, the program has been successfully delivered to Veterans through a number of organisations, including RSL NSW, demonstrating its relevance to both transitioning and post-service veterans. These implementations have shown that military and first responder groups, such as Police and Correctional Services, respond strongly to the

program due to shared service values and learning culture.

Key features of the SRF program include:

- Cultural specificity and a group-based format aligned with defence learning environments
- Evidence-based, approachable psychological tools for stress and distress management
- Lived experience facilitators working within a clinical governance framework
- A licensing and Train-the-Trainer model that enables organisations to build internal delivery capacity, supported by Frontline Mental Health

SRF represents a scalable, research-informed, and culturally aligned approach to mental fitness that moves beyond recovery to focus on sustaining adaptive functioning under pressure. This abstract will outline the evolution of the program, delivery outcomes, and next steps in evaluation, offering a practical model for preventative mental health intervention across the defence and veteran landscape.

Supporting High Psychological Threat Missions through the Use of the Hui Process

Mrs Kirsty Whitehead[1]

1 New Zealand Defence Force, Shannon, New Zealand

Biography:

CAPT Kirsty Whitehead, New Zealand Army

Kirsty Whitehead joined the New Zealand Defence Force in 2020, serving with the New Zealand Army. During her registration period she spent time as a camp psychologist in Linton, as well as supporting the NZ Army training schools. Upon completing registration with the New Zealand Psychology Board through the NZDF, Kirsty spent three years posted to Linton military camp, supporting a range of psychological activities including selection and assessment, coaching, providing guidance to command, and supporting operations. In 2024 Kirsty transitioned into her current role as the operational support psychologist, with a focus on providing psychological support and advice within a deployment context. This includes supporting high psychological threat missions, coordinating selection for key deployments and supporting the wider NZDF Psychology within the operational space.

The New Zealand Defence Force (NZDF) supports operational efforts around the world, with varying levels of associated psychological threat. For the NZDF missions may be categorized as 'high psychological threat' (HPT) due to the nature of the deployment, taking in to account factors such as the environment (including physical, social and geopolitical), the overall mission intent, workload, exposure to graphic material or the grotesque, and an increased likelihood of being exposed to potentially traumatic events or critical incidents.

The contribution the NZDF has to a range of HPT missions has resulted in a greater percentage of deployed personnel experiencing higher degrees of difficulty during reintegration to life back in New Zealand (e.g. relationship difficulties, divorce, exited the service) than those who deploy on non-high psych threat missions. As a result of the above, the NZDF has developed a bespoke framework to support those who deploy on HPT missions. This has resulted in the provision of a more intensive psychological support program than is typically delivered to standard missions. This program has included additional Pre Deployment training, bespoke support during the mission (that is tailored to the mission) and bespoke Post Deployment support and debriefing (dependent on the mission).

A key aspect of the support to HPT missions lies in the relationship building with those deploying, and for family members of those deploying. One framework that is useful/beneficial in building these relationships is the Te Ao Maori Hui process (Al-Busaidi et al., 2018; Lacet et al., 2011; Pitama et al., 2017). The Hui process embraces Te Ao Maori engagement strategies to provide a framework to structure interactions with clients, and is broken down in to four stages. First is a mihi (greeting) which involves introducing oneself and providing context for the client and explaining the role of the psychologist. Next comes whakawhanaungatange (building the relationship/connections).

The kaupapa (the work of the referral) is the third stage of the Hui process, and is focused on the purpose of the encounter. This may include gaining an initial appreciation for service persons well-being prior to deploying, wider whanau support, understanding individual strengths of the service person, or working with individuals virtually in theatre to provide brief psychological interventions.

Finally, the poroaki (closing the session), ensures that each encounter is closed appropriately and focuses on summarising the encounter with the individual and ensuring that it is clear to both parties on what happens next. With HPT support this would

occur at many times, from the initial interaction confirming what support in-theatre looks like, to each interaction during deployment confirming what the next touch point will look like to the return home and ensuring the returning to New Zealand support process is understood.

Overall the support provided to HPT missions is viewed favourably by those deploying on HPT missions, and has assisted individuals in reaching out for additional.

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The ANZAC Research Institute: Opportunities for Research Collaborations

Prof Victoria Cogger[1,2,3], Professor Tracy Smart[1,4], Dr Cameron Korb-Wells[2,3,5], Associate Professor Anthony Linton[2,3,6]

1 *Anzac Research Institute, Sydney, Australia*

2 *Concord RG Hospital- Sydney Local Health District, Sydney, Australia*

3 *University of Sydney, Sydney, Australia*

4 *The Australian National university, Acton, Australia*

5 *National Centre for Veterans Healthcare, Concord RG Hospital, Australia*

6 *Asbestos and Dust Diseases Research Institute, Concord RG Hospital, Australia*

Biography:

Professor Smart is a medical doctor, health leader, aerospace medicine specialist, and retired Royal Australian Air Force (RAAF) senior officer. During 35 years of service, Prof Smart served in tactical, operational and strategic roles; on overseas deployments to Rwanda, Timor Leste, the Middle East, and Lebanon; undertook exchange tours with the Royal Air Force and the United States Air Force; and served as Surgeon General of the ADF and Commander Joint Health from 2015 to 2019. She transferred to the RAAF Reserve in early 2020.

Prof Smart is currently Professor, Military and Aerospace Medicine at the Australian National University, working in the subject areas of space medicine, serving as a Mission Specialist (Space Medicine) at ANU InSpace, Defence health engagement, Health Security. She was ANU's COVID Public Health Lead until March 2022.

In addition to her ANU duties, Prof Smart undertakes numerous Board and Advisory group roles and has most recently been invited to be Chair of the ANZAC Research Institute Advisory Council.

The ANZAC Research Institute (ARI) was founded in 2000 to continue the legacy of health research and support to veterans at Concord Repatriation General Hospital, the tertiary teaching hospital on the site of the former 113th Australian General Hospital, established during the Second World War.

The vision established in the years leading to the founding of the ARI, was: "to provide leadership and excellence in health and medical research activities throughout Australia, focusing on lifestyle and ageing issues to improve the future health standards for the Australasian community. In doing so The Foundation plans to provide a lasting legacy to the veterans and war widows who have created the society we have today" .

More specifically, the Mission statement included the intent: "To undertake research to study and improve healthcare delivery and outcomes, including epidemiological studies, particularly among the Veteran and War Widow Community and children of Veterans" .

Over the last 25 years, much of ARI's focus and success has continued to be in research on lifestyle and ageing issues. Epidemiological research has also been a feature of ARI's work, including for many years the Australian Vietnam Veterans' Health Study (VVHS). This study, which began in the late 1980s, was housed at the Institute from the mid-2000s until 2011 and included research on War Widows and children of veterans .

In late 2025, the Institute commissioned a review of

Defence and Veteran research opportunities to better understand how it could meaningfully contribute to positive health outcomes for those who serve. Consultations with key stakeholders indicated a growing need to address not only the mental health concerns of veterans and serving members, but the physical outcomes. These include priorities such as management of battlefield casualties; prevention and treatment of traumatic brain injury; through life surveillance and monitoring of the health of serving members and veterans; prevention and management of musculoskeletal injuries; managing the unique occupational environment and the impact on their health; chronic pain; and the management of co-morbidities.

The ARI has both the legacy and expertise, including in diseases of ageing, to align with, and meaningfully contribute to, Defence and DVA health priorities by conducting 'bench to bedside and back again' research with Defence personnel and veterans at its centre. Examples of established programs includes:

- Longitudinal population studies including The Concord Healthy Ageing in Men Project (CHAMP), Concordance cardiovascular health database;
- Gene discovery in chronic illness (discovery of genetic causes of Charcot Marie Tooth);
- Discovering new medicines and treatments (Smart oral insulin, 3D printing of skin for burns injuries);
- Biomarker discovery for the early detection of disease, diagnosis or prediction of disease recurrence (Cardiovascular disease, vaccine induced thrombosis);
- Better management of chronic disease (Glucocorticoid impacts on osteoporosis, neuroinflammatory disease, secondary falls risk identification and prevention).

New partnerships with the National Centre for Veterans Healthcare, the Asbestos and Dust Diseases Research Institute have augmented extant embedded relationships with the Hospital and University of Sydney, creating the opportunity to recreate a pillar of research that is focused specifically on the health of serving Defence members and Veterans. The resultant health ecosystem will create a unique capability in Defence and Veteran health research and we invite new partners to join us in creating this unique biomedical research stream, focused on physical health and wellbeing.

The Hero's Journey: Narratives of Mental Health Recovery in NZDF Personnel

SQNLDR Carsten Grimm[1]

1 New Zealand Defence Force, Wellington, New Zealand

Biography:

SQNLDR Carsten Grimm joined the RNZAF in 1997 as a pilot and spent most of his flying career on 3 Squadron operating the Iroquois. He deployed to East Timor in 2001, again in 2002 and to the Solomon Islands in 2003 before graduating Flying Instructors Course in 2006 and posting to Pilot Training Squadron (now 14 Squadron) to teach ab initio flying training. In 2009 he deployed to Afghanistan as part of Op CRIB 13 on Kiwi Patrol One in the Yakawlang district of Bamiyan. In 2010 he became a Reservist while completing his Masters in Psychology and working for the Mental Health Foundation promoting wellbeing campaigns across New Zealand. In 2015 he returned to active service as a military psychologist and has served in various roles including Base Psychologist Woodbourne and the Flying Training Wing Psychologist. He recently completed his doctoral research in clinical psychology on NZDF members' experiences of accessing mental healthcare, which identified both success stories and lessons for how to better support the mental health of our service personnel. He is currently posted to Linton as the Camp clinical psychologist.

Research on military mental health recovery has tended to focus on therapy outcomes while backgrounding the role of diverse healing influences. The New Zealand Defence Force (NZDF) is a bicultural military integrated with Māori customs and cultural perspectives on holistic health and wellbeing. This study used narrative analysis to examine the semi-structured interviews of 21 active duty NZDF personnel who had accessed mental healthcare to understand what factors contributed to their return to wellness. Participants described their mental health recovery using a better-than-before narrative structure aligned with the hero's journey, which involved challenges crossing the help seeking threshold and concluded with positive personal transformation. Stories of holistic recovery adopted culturally available Māori well-being heuristics to narrate the interconnection of relationships and health behaviours that supported participant healing. Participant accounts of seeking support also reflected paradoxical narratives, as the NZDF mental health system both helped and hindered personnel during their period of distress. Many of the cultural aspects of the NZDF were described as strengths

but also as barriers that prevented personnel from connecting to care that was effective and meaningful to them. Findings are considered in terms of how wellbeing and recovery are conceptualized and promoted within militaries with diverse cultures. Discussion focuses on how narratives within military institutions can promote resilience and support service member recovery from mental distress

The Joint Medic Training Continuum: Supporting Medic Career Progression

Maj Sarah Patterson[1], Jacob Chambers, Grant White

1 ADF School Of Health, Bonegilla, Australia

Biography:

This presentation will be facilitated by members of the ADF School of Health, MAJ Sarah Patterson and LT Grant White, and ALTC Workforce and Training Group, CAPT Jacob Chambers.

MAJ Patterson is currently the Officer Commanding / Senior Instructor of the Medical Technician Wing at ADFSH and responsible for leading the JMED Training Continuum implementation.

LT White is the Officer in Charge of the Project Development Team at ADFSH. He is responsible for the course management of the JMAC, JMSC and JMMC, whilst concurrently working on continuous improvement across the develop, implement and evaluate stages of the SADL.

CAPT Chambers is currently SO3 Health Army Employment Category Management at Workforce and Training Group. He is responsible for the course analysis and design phases of the SADL, and has been actively engaged with the JMAC, JMSC and JMMC roll out since January 2024.

Part of the 2024 Defence Force Remuneration Tribunal (DFRT) submission to standardise the ADF Medic workforce was the establishment of a Joint Medic (JMED) Training Continuum. The intent of the continuum is to expand training for Medics to support career development noting there has been increased capability requirements through the years. Changes to Medic training commenced with the Joint Medic Course in 2019 and has expanded to include the Joint Medic Advanced Course (JMAC), the Joint Medic Supervisor Course (JMSC) and the Joint Medic Manager Course (JMMC). Implementation of the 2024 DFRT Determination is set to continue until 2029.

Using the Systems Approach to Defence Learning (SADL), Service specific requirements for Medics at each level were analyses with significant input from subject matter experts across Services. The SADL process culminated in the design of the JMAC, JMSC and JMMC Learning Management Packages (LMPs) which were handed over to the ADFSH Project Development Team. Development work has continued collaboratively between Workforce and Training Group, ADFSH and tri-Service Subject Matter Experts (SMEs) to develop the courses to ensure training outputs remain relevant to tri-Service attendees and achieve outcomes of the DFRT submission. Progressive implementation of the courses has occurred since 2024. As at conference date, JMAC and JMSC are now active courses with JMMC undergoing trial.

The initial structure for all three courses was an ADELE learning package, weekly Big Blue Button sessions, and number of summative assessments, all conducted over a five-month period. Trainees were expected to have all online learning, learning activities and summative assessments completed two weeks prior to course end, to allow for marking and reassessments.

During the course implementation phase, ADFSH staff have closely monitored trainee engagement and have observed the emerging trends. These trends have differed across the courses, owing to the learner profile. A key observation made during JMAC was that students were often unable to manage their own time effectively, resulting in significant additional effort from both ADFSH and unit staff in the final weeks of the course. This led to the implementation of some adaptations to the course structure to assist in reducing the burden on ADFSH and unit staff.

It is further surmised that the relative course infancy and lack of workforce understanding of the new Joint Medic career profile has resulted in an incongruence between workforce and ADFSH expectations of the courses. ADFSH is committed to the ongoing professional development of the Joint Medic. Going forward, greater collaboration and communication between ADFSH, units and the medic workforce will be essential for the successful implementation of the Joint Medic career profile directed by DRFT.

This presentation is aimed at facilitating a conversation; educating the wider ADF Health workforce, and enabling the feedback loop as part of the evaluation phase of the SADL.

The Proposed Garrison Health Rehabilitation Continuum: Optimising Musculoskeletal Rehabilitation Services in the Australian Defence Force

Mr Simon Olivotto[1]

1 Department Of Defence, Sydney, Australia

Biography:

Simon is a Specialist Musculoskeletal Physiotherapist and Fellow of the Australian college of Physiotherapists. He currently works as the Assistant Director Garrison Rehabilitation Services within Joint Health Command, Australian Defence Force (ADF).

Simon has well over 20 years experience providing rehabilitation for ADF members with musculoskeletal disorders. Simon is currently undertaking a PhD focussed on identifying prognostic factors to inform rehabilitation pathways and optimise outcomes for ADF personnel with musculoskeletal disorders.

Background

Musculoskeletal disorders are a leading cause of non-deployable restrictions and medical separations in the Australian Defence Force (ADF). There are opportunities to optimise recovery outcomes by adopting early intervention models and aligning best practice clinical care to minimise unnecessary medical escalation. This presentation aims to update the work being done to optimise Garrison Rehabilitation service delivery (clinical and occupational rehabilitation) across a continuum from proactive early intervention, rehabilitation and reintegration back into the workplace for ADF members with musculoskeletal disorders.

Aims

This presentation will:

1. Outline the current Garrison Rehabilitation service model, including secondary and tertiary prevention strategies for musculoskeletal disorders.
2. Examine the risks associated with guideline non-concordant care such as early escalation to imaging or invasive procedures prior to active rehabilitation.
3. Identify opportunities to enhance recovery through early intervention service-level initiatives.

Content overview

The presentation will describe how musculoskeletal rehabilitation is delivered within ADF Garrison Health, including the role of embedded and regional rehabilitation services. It will explore barriers and facilitators to best practice care including the risks and unintended consequences of early advanced imaging or medical procedures prior to exploring evidence-based first line care rehabilitation options. Case examples, evidence from contemporary musculoskeletal literature, and data from recent service evaluations will be used to illustrate system level patterns and opportunities for delivering optimal care. The Proposed Garrison Health Rehabilitation Continuum model will be presented and serve as framework to describe how Garrison Rehabilitation intersects with Force Health Protection and Single Services to provide proactive best practice care.

Key Messages

- There is a critical need to shift from reactive, tertiary care to proactive, preventive models.
- Enhancing guideline concordance and reducing low-value care can improve recovery and operational readiness.
- Service delivery efforts should prioritise early access, multidisciplinary integration, and early identification of individuals who are not recovering as expected.

Conclusion

Optimal musculoskeletal care in the ADF requires system-wide alignment with evidence based practice principles. Proactive rehabilitation pathways that support recovery in the workplace whilst minimising unnecessary medical escalation are vital to ensure healthcare efficiency, maximised return to work outcomes, and support the long-term health of serving members.

Treatment Preferences for PTSD among Australian Defence Force Members: Preferred Treatment, Predictors and Reasons for Choice

Prof Jennifer Wild[1,2,3], Dr Katrina Moss[1,4], A/Prof Jonathan Lane[1,5], Dr Zoe Jenkin[s1]

1 *Directorate of Health Research, Joint Health Command, Department of Defence, Canberra, Australia*

2 *Phoenix Australia Posttraumatic Centre for Mental Health, Department of Psychiatry, University of Melbourne, Melbourne, Australia*

3 *Department of Experimental Psychology, University of Oxford, Oxford, United Kingdom, Oxford, United Kingdom*

4 *Australian Women and Girl's Health Research Centre, University of Queensland, Brisbane, Australia*

5 *Department of Veterans' Affairs, Australia*

Biography:

Jennifer Wild is Professor of Military Mental Health at Phoenix Australia, University of Melbourne, the Australian Defence Force, and Visiting Professor of Experimental Psychology at the University of Oxford. Her area of expertise is in developing interventions to prevent the onset and persistence of PTSD and major depression in high risk occupations at risk of trauma, such as military members, and in developing and evaluating evidence-based interventions for anxiety and stress disorders. She is dedicated to improving treatments so they are more precise and effective and reach the people who

need them most. She has written over 100 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. Professor Wild regularly appears in the media giving advice rooted in science for preventing the onset and persistence of trauma-related mental health problems.

Background

Although evidence-based treatments are recommended for PTSD and generally preferred by civilian populations, research suggests that military personnel are likely to prefer self-management strategies. This study examined PTSD treatment preferences among Australian Defence Force (ADF) members when provided with comprehensive information about evidence-based interventions and support options.

Methods

A total of 3,544 permanent and reserve ADF members completed a treatment preferences questionnaire developed for this study, which provided detailed information about common PTSD symptoms and eight treatment options presented in randomised order. Participants first indicated the threshold of impairment, if any, that would prompt them to seek treatment, then selected their preferred PTSD intervention. Those selecting evidence-based talking therapies were subsequently presented with expert-developed descriptions of four specific CBT therapies: prolonged exposure therapy (PE), cognitive therapy for PTSD (CT-PTSD), eye movement desensitisation and reprocessing therapy (EMDR), and cognitive processing therapy (CPT), and asked to indicate any preference among these options, again presented in randomised order. Following treatment selection, participants identified reasons for their choices and completed treatment-seeking appraisals including self-reliance, perceived barriers, and anticipated negative consequences of mental health treatment. Standardised instruments assessed fear of negative evaluation, PTSD, depression, and social anxiety symptom severity, while the endorsed and anticipated stigma inventory (EASI) measured beliefs about mental health treatment and perceived stigma. Preferences for treatment delivery, terminology and information sources for mental health were also assessed. The study was approved by the Australian Defence Human Research Ethics Committee (protocol number: 586-24).

Results

Contrary to previous research suggesting military preference for self-management of mental health symptoms, evidence-based talking therapy was overwhelmingly preferred, chosen by 45.1% of participants. This preference was 3.6 times higher than expected by chance ($\chi^2(7, N = 3,544) = 3516.00$, $p < .001$) and 4.7 times more frequent than preference for medication (9.6%). Among talking therapy options, CT-PTSD was the most frequently selected individual therapy (32%), while 45% selected 'any of the above' $\chi^2(4) = 973.56$, $p < .001$. PE, CPT, and EMDR were selected less frequently (10%, 6%, and 7% respectively). Preferences for treatment delivery included external healthcare providers (71.4%) and in-person treatment (76.9%). Treatment-seeking thresholds varied: 43.6% would seek treatment at severe symptom impact, 30.3% at moderate impact, 3.9% at mild impact, and 9.0% would never seek treatment. Information sources for mental health included Defence medical appointments (52.8%), external medical appointments (45.7%), and internet searches (38.1%). Most participants (67%) preferred the term 'mental health symptoms' over 'symptoms of a psychiatric disorder.' Concerns about Medical Employment Classification changes would deter 50.6% from seeking treatment.

Conclusions
When provided with comprehensive information about treatment options, ADF members strongly preferred evidence-based talking therapies over self-management approaches, challenging assumptions about military culture favouring self-management of symptoms. CT-PTSD was the preferred individual therapy by a third of participants, while almost half expressed no preference among evidence-based talking therapy options. Perceived importance of memory work was the most consistent predictor of preference for evidence-based talking therapy, suggesting that psychoeducation about how therapies work may influence treatment selection. The preference for in-person over guided digital approaches may reflect limited awareness that guided digital interventions often involve more frequent clinician contact than traditional therapies. These findings support prioritising trauma-focused therapies in military mental health services and highlight the need for availability of CT-PTSD alongside other evidence-based options.

Note: The opinions expressed in this abstract are that of the authors/presenters, and not of the Department of Defence.

Using Virtual Reality to Foster Deep Learning About Pain and Recovery: Safety, Acceptability and Feasibility in Veterans

Dr Dianne Wilson[1,2], Dr Millie Mardon[1,2,3], Dr Hayley Leake[1,2], Dr Daniel Harvie[1,2], Dr Andre Andrade[4], Dr K. Jane Chalmers[1,2], Aaron Bowes[5], Professor Lorimer Moseley[1,2]

1 *IIMPACT in Health, University of South Australia, Kaurna Country, Adelaide, Australia*
2 *The Pain Education Team Aspiring Learning (PETAL) Collaboration*
3 *NICM Health Research Institute, Western Sydney University, Sydney, Australia*
4 *Quality Use of Medicine Research Centre, The University of South Australia , Kaurna Country, Adelaide, Australia*
5 *IPAR Rehabilitation, Melbourne, Australia*

Biography:

Dianne has combined a clinical and academic career as a physiotherapist. Her clinical work sparked an interest, and then a passion, for the pain sciences and translation of them into clinical practice The promotion of evidence-based management of chronic pain into the community was complemented by Dianne's involvement in the Australian Physiotherapy Association where she held both state and national leadership roles, mainly in the chronic pain field. She was involved in the establishment of a National Pain Group which subsequently developed a specialisation pathway for pain physiotherapists through the Australian College of Physiotherapy.

Following the completion of her PhD investigating the role of the group in Pain Management programs, Dianne has continued to work part-time as a Research Associate in the Research Group, IIMPACT in Health, University of South Australia. She continues to promote the translation of pain science into clinical practice through Pain Revolution, an initiative of the University of South Australia which aims to change "how people understand pain in rural and regional communities in Australia".

Background
Many veterans live with chronic (persistent) pain. Chronic pain is one of the top reasons veterans are medically discharged. A psycho-educational approach to reducing chronic pain - called Explain Pain, or Pain Neuroscience Education (PNE) – emerged about 25 years ago and has been tested in over 90 clinical trials, with meta-analyses demonstrate good effects on pain and disability. However, shortcomings in PNE led to a new iteration called pain science education (PSE), which targets the understanding of specific learning objectives and their operationalisation towards recovery. This understanding has been shown to reduce both pain and depression in veterans. However, PSE is difficult and both clinicians and patients have been asking for more effective tools that can impart learning quickly, safely and with less need for clinicians to have advanced training in pain management and education. Using virtual reality (VR) has been transformative in the wider education field; using it to deliver pain education is a new idea. We tested in a cohort of veterans and clinicians who treat them, the safety, acceptability and utility of the Reality Health Pain Education platform.

Methods
We ran two workshops: one with 7 veterans with chronic pain, and one with 6 health professionals who care for them. Everyone completed 3 – 6 modules of the Reality Health VR-based pain education program. Afterward, they completed a survey about usability, acceptability, and usefulness of the VR platform and a short pain knowledge quiz; they then participated in a facilitated group discussion on their experience of the platform.

Analysis
We used simple statistics on the quantitative data, and a qualitative approach on group discussion data. We looked for patterns in the group discussions using an a-priori selected analytical framework designed for evaluating patient perspectives on new health interventions.

Results
Veterans and clinicians both felt that the VR pain education program was clear, helpful, and realistic to use in a clinical setting. Veterans' understanding of pain improved after using the program. Clinicians mentioned a few concerns (e.g., possible side effects from VR or difficulty using technology), but veterans did not report these as problems. Veterans actually felt confident using the VR system and wanted it to be available earlier in their training. They also recommended that clinicians take the course themselves.

Conclusion
The VR-based pain education program was well received and easy to use. There were no apparent adverse experiences. It helped veterans better understand their pain. Future studies should test how well it works over time and how it might be used more widely in veteran pain care.

Utilising the VETERANs Lens Consultation Tool to Optimise Veteran Health and Wellbeing

Dr Catherine Eltringham[1]

1 Medcast, Sydney, Australia

2 DVA, Canberra, Australia

Biography:

Dr Catherine Eltringham is a GP Medical Educator based in Geelong, Victoria. She has been working with Medcast on developing engaging, interactive CPD opportunities for General Practitioners, including the DVA project VETs-HeLP developing a series of resources to improve veteran's health and wellbeing post transition through improving GP understanding of the impacts of service on health.

Catherine is also involved in RACGP General Practice training, specialising in Medical Educator professional development and has just taken on a National Clinical Lead role in this area.

Working in General Practice education requires a balance between education roles and clinical work, Catherine consults in a private GP clinic in Highton, Victoria where she supports a small number of veteran patients in her patient cohort.

When at University Catherine worked as a musician in the Army Reserve, 4th/19th Prince of Wales Lighthorse, and now serves her community as a volunteer firefighter.

To improve the post transition general practice experience of Australian veterans DVA funded an education program. Medcast was contracted to develop a series of educational opportunities for General Practitioners, but which are also useful to other health professionals. One of the resources developed is a consultation tool titled the VETERANS lens.

The VETERANS lens was designed to guide and remind GPs of the importance of exploring additional aspects of the history when consulting with veteran patients and also where relevant with their family members.

This VETERANS lens was developed utilising the information traditionally covered by a Veteran Health Check (VHC) but can be easy to access when veterans are no longer eligible for a VHC. The lens reminds us to continue to explore and consider the veterans time of service even years after transition.

The VETERANS lens can be printed, saved on the desktop or an autofill pasted into the practice software to improve ease of access and use.

The educational activities were developed under review of a team of medical personnel working with DVA, to ensure accuracy of the portrayed patients and up to date information and resources.

This presentation is an opportunity for military doctors to see the type of education available to GP's and other health providers who may have limited understanding of the impact of service on a veteran's health. Knowing this education exists allows promotion to non-serving GPs for upskilling, context to GPs who work with veterans through times of transition and opportunity for serving members to talk to their GP on their own transition about seeking improved understanding.

Medcast would be honoured to share this information with your audience to promote this free access, on demand educational activity which can be downloaded or incorporated into practice software via an autofill.

Walking Blood Bank: Benefit in Contingency and Kinetic Operations

Prof Mansoor Khan[1], Dr Jonathan Kendrew[1]

1 Iqarus, United Arab Emirates

Biography:

Professor Mansoor Khan is a highly accomplished trauma surgeon, academic, and retired Surgeon Commander of the Royal Navy, where he served with distinction. With a career spanning military medicine, trauma care, and humanitarian operations, he has been at the forefront of emergency and disaster medicine in some of the most challenging environments worldwide.

After retiring from the Royal Navy, Professor Khan transitioned into global health and remote medical services, currently working with Iqarus, a leading provider of healthcare solutions in complex and high-risk settings. In this role, he applies his extensive expertise in trauma, emergency medicine, and crisis response to deliver life-saving care in conflict zones, natural disasters, and austere environments.

A respected educator and researcher, Professor Khan has contributed to advancements in trauma surgery and military medicine, mentoring future generations of surgeons. His dedication to improving medical systems under extreme conditions has made him a key figure in both military and humanitarian healthcare.

The implementation of a walking blood bank (WBB) offers significant advantages in both low and high-threat environments, particularly in settings where logistical constraints, financial limitations, or operational urgency hinder traditional blood banking. Transporting and storing refrigerated blood products in contingency operations, such as military deployments, humanitarian missions, or disaster response, requires specialized refrigeration, reliable power, and secure supply chains, all of which are vulnerable to disruption. A WBB mitigates these challenges by leveraging pre-screened, readily available donors to provide fresh whole blood (FWB) at the point of need, eliminating dependence on cold storage and long-distance transport. This approach not only reduces costs but also enhances operational flexibility in resource-limited or hostile environments.

FWB has demonstrated superior clinical benefits in major trauma resuscitation, particularly in military and austere medical settings. Unlike component therapy, which separates blood into red cells, plasma, and platelets, FWB preserves functional platelets, clotting factors, and plasma proteins in their natural ratios, promoting better haemostasis and reducing trauma-induced coagulopathy. Studies in combat casualty care have shown that early FWB transfusion improves survival in haemorrhagic shock, particularly when evacuation timelines are prolonged. In high-threat environments, such as forward-deployed military units or remote disaster zones, where resupply is unreliable, a WBB ensures immediate blood availability without logistical delays. Even in low-threat settings, maintaining a WBB as a contingency measure can reduce reliance on costly blood bank infrastructure while ensuring readiness for mass casualty events.

However, successful WBB programs require rigorous donor screening, rapid transfusion-transmissible infection testing, and standardized medical protocols to ensure safety and efficacy. Training medical personnel in donor mobilization and transfusion techniques is critical. When properly executed, a WBB enhances trauma survivability, optimizes resource efficiency, and provides a scalable solution for blood supply challenges across diverse operational environments.

Would You Let Him Fly? A Case Study of Possibility

SQNLDR Daniel Cehic[1]

1 RAAF, Edinburgh, Australia

Biography:

SQNLDR Daniel Cehic is Deputy Regional Director of Health Force Health Reserves SA/WA/NT. He is a cardiologist - electrophysiologist - and assists the Institute of Aviation Medicine at RAAF Edinburgh with aspects of aviation cardiology.

Medical Background

46-year-old rotary wing pilot with no other significant medical history.

In a routine medical he volunteered that on occasions he would notice his heart rate climbing to 160 bpm in circumstances where he was not exerting himself as detected by his Garmin smartwatch. He had no symptoms correlating to these events.

Because of occupational factors, he was referred to a cardiologist and subsequent evaluation of his heart was normal, and he went on to have an electrophysiological study (EPS).

The EPS detected that the cause of his periods of tachycardia was dual atrioventricular nodal physiology, and he was having periods of supraventricular tachycardia (AVNRT).

He went on to have a slow pathway ablation procedure, which was complicated by fast pathway injury and hence his AV node was compromised, and he was left with periods of AV block – ranging from Mobitz I second degree heart block to 2:1 second degree heart block. When he was in 2:1 heart block his minimum heart rate detected was 33 beats per minute.

The question was raised whether he needed a pacemaker and/or would he be safe to return to pilot duties.

Anatomy and Physiology of the AV node and His bundle

The conduction pathway from atria to ventricles consists of the AV node located at the base of the right atrium turning into the HIS bundle which penetrates the central fibrous body (separating the atria and ventricles and off which the mitral and tricuspid valves are based – effectively rendering electrical isolation top to bottom) and then turns into the bundle branches to supply the ventricles.

In people with dual AV nodal physiology there are two distinct anatomical pathways leading into the central AV node with different physiological properties. Because of their distinct physical locations they can be specifically targeted for destruction by radiofrequency ablation when needed to treat SVT that is caused by a reciprocating circuit involving both of these pathways.

The AV node has neurohormonal regulation and has more prevalent parasympathetic than sympathetic fibres. Parasympathetic activation leads to a slowing in AV nodal conduction, Wenckebach conduction block and reduces automaticity. Sympathetic stimulation results in the reverse.

It is important to note that the His bundle, which sits below the level of the AV node, has the property of automaticity which is commonly seen clinically as an escape rhythm when people go into complete heart block and usually result in stable rhythms of ~40 bpm.

Relevant Findings on Review

He was well with no symptoms and the only relevant feature on examination was a heart rate of 56 bpm with ECG showing sinus rhythm with Mobitz I second degree heart block.

Holter monitor during flying activities revealed no evidence of heart block with sinus tachycardia and 1:1 AV nodal conduction to a rate of 114 bpm (he presented as a very calm individual).

A repeat EPS was performed to assess the integrity of his conducting system below the level of the AV node (known to be injured) and it was noted that his His-Ventricular interval (HV) was normal thereby giving reassurance of integrity of the conducting system and therefore the automaticity and escape properties of the His bundle region.

Recommendations and Outcomes

Current guidelines do not recommend pacing for this type of heart block in the absence of symptoms, so he did not need a pacemaker. The insertion of a pacemaker would make return to flying more difficult, if not impossible.

Given the likelihood that the AV block would not be progressive, that even if it ever did because of further degeneration or parasympathetic stimulation it is likely he would have an adequate ventricular escape rhythm and the ability for him to continue to be operational with a “with or as co-pilot” restriction it was felt appropriate and safe enough to return him to operational flying duties.

Wounded and Without Rescue: Having to Provide Clinical Care to Multiple Casualties Whilst Also Being Wounded by an Improvised Explosive Device (IED). Clinical Decision Making and Leadership in Extremis

LCDR Travis Robinson[1]

1 Australian Defence Force, Canberra, Australia

Biography:

LCDR Robinson has had an extensive military career which has seen him deploy both in Australia and overseas. Originally entering service as an Infantry soldier, LCDR later commissioned into the RAANC. As an Army Nurse, he spent time at 11 Close Health Company, before moving to support the 6th Aviation Regt, during which time he received the Sikorksy Rescue Award for a lifesaving mission in a Blackhawk Helicopter. LCDR Robinson was then successful in being selected for a posting to SOCOMD and served 3 years in the 2nd Commando Regt where he served on the Tactical Assault Group - East as a clinician and also deployed with the Special Operations Task Group to Iraq as the Medical Supervisor. LCDR Robinson subsequently transferred to the RAN and led the aeromedical team and deployed to the bushfires in this capacity. Not long after Op Bushfire Assist,

LCDR Robinson deployed to Afghanistan to the Role 2 Hospital in Kabul. He was the first Navy Nursing Officer to be successful in being chosen for Op Paladin and deployed to Southern Lebanon in 2023 as an Unarmed United Nations Military Observer. He was Wounded In Action 30 March 24 and repatriated to Australia for treatment.

I was deployed on Operation Paladin in July of 2023 and assigned to Observer Group Lebanon (OGL) as an unarmed UN Military Observer (UNMO). This is the ADFs contribution to the United Nations Truce Supervision Organisation (UNSTO), where for the last 76 years UNMOs from Australia have been observing, monitoring and reporting on violations against the United Nations Security Council Resolution 1701.

On the 30 March 2024, five months after the Israel-Hamas-Hezbollah war started, I made a plan to conduct a patrol to observe an area on the Lebanon/Israel border. Due to the tensions and sensitivities I had spent a number of days planning and liaising with numerous UN organisations, Israeli Defence Force and local assets. My team and I were confident that we had exhausted every measure to ensure the safety of the patrol. At approximately 0845 on the 30 March 24, Team Victor, comprising of two armoured 4WDs, four UNMOs and an interpreter made our way to the designated area. Arriving at the area, the road was blocked due to damage caused by an airstrike, so we made the collective decision that we would exit the vehicles and proceed on foot the few hundred meters to the site. I was to lead the foot patrol, followed by an UNMO from Norway and Chile, with the Swiss UNMO staying with the vehicles.

Approximately 100m along the path, an an explosion occurred critically injuring the three of us. I was blown to the ground, having numerous large fragmentation impacts to my helmet and body armour as well as wounds to my face, shoulder, arm, flank and leg. Not to mention instantly rendered deaf in my left ear and disorientated. On the ground, I went through years of training... self aid... buddy aid... medic aid. Am I safe? Is the scene safe? are there other survivors? I checked myself for major haemorrhage, then found my radio and sent the "MAYDAY". I could start to see my colleagues through the smoke and debris and unsteadily made my way to the UNMO from Norway. He was peppered with shrapnel and bleeding , also deaf and had a broken arm, but at first glance no life threatening injuries.

I then heard my other UNMO from Chile call my name. Through the smoke and debris, I saw she could not stand without falling. I moved toward her and saw her wounds and burns, my heart sank. I knew straight away she would need surgery. If we waited for a CASEVAC it would be over an hour just to get to us, I knew she needed urgent stabilisation and a helicopter to get her to Beirut for surgery. As the Team and Patrol Leader, I made the decision that even though injured, the team would have to conduct a self rescue and I would have to treat both my colleagues as best as I could on the move. While carrying my colleague to the vehicle I made a hasty movement plan and yelled it to the Swiss UNMO who was uninjured. I put my injured colleague on the backseat of the car, squeezed into the footwell between the front and rear seat on my knees so I could treat her. The injured UNMO from Norway, even though injured had to reverse 300m through a known minefield to a turn-around point before proceeding to our patrol base.

Within minutes I had exhausted the teams medical supplies and then became acutely aware of the shrapnel sticking out of me, as well as my other injuries. I continued to treat both casualties as best as I could given the confines and lack of supplies, as well as providing MIST updates over the VHF so the trauma team was ready for our arrival.

That morning, years of training were condensed into 40 minutes of terror.

A Longitudinal Investigation of Natural Killer Cell Cytotoxicity in Australian Veterans with Gulf War Illness

Miss Jessica Dwyer[1,2], Dr Natalie Eaton-Fitch[1], Professor Sonya Marshall-Gradisnik[1]

1 *National Centre for Neuroimmunology and Emerging Diseases, Griffith University, Gold Coast, Australia*

2 *School of Pharmacy and Medical Sciences, Griffith University, Gold Coast, Australia*

Biography:

Jessica Dwyer is a Research Assistant, supporting laboratory research aimed at implementing diagnostic tests and discovering evidence-based treatments to improve health outcomes. She is also a member of the Clinical Trial Team.

Her Master's research focuses on investigating Natural Killer (NK) cell cytotoxicity dysfunction in Gulf War Illness, aiming to elucidate immune system alterations in affected Veterans.

Introduction

Affecting approximately one-third of veterans of the 1990-1991 Persian Gulf War, Gulf War Illness (GWI) is a complex, multifactorial disease characterised by a range of persistent symptoms including post-exertional fatigue, cognitive impairment, and musculoskeletal pain. The aetiology of GWI remains unknown, and no definitive biomarkers or diagnostic tests currently exist. However, GWI has been linked to significant alterations in immune function, with previous research documenting changes in cytokine signalling, the presence of autoantibodies, and, more recently, ion channel disturbances in natural killer (NK) cells of veterans with GWI compared with healthy controls (HCs). Despite these findings, research on the role of NK cells in GWI remains limited. Therefore, this research aims to investigate longitudinal NK cell cytotoxic function in Australian veterans with GWI compared to HCs using flow cytometry.

Methods

Participants included Australian Veterans meeting both the Centers for Disease Control and Prevention (CDC) case definition for GWI. Sex-matched HCs with no history of chronic disease were also recruited as a comparison cohort. Peripheral blood was collected, and NK cells were isolated using negative immunomagnetic selection with commercially available kits. Cytotoxic activity was determined by co-culturing the isolated NK cells with K562 target cells at varying effector-to-target ratios. Apoptotic and necrotic activity was measured using Annexin V and 7-Aminoactinomycin D (7-AAD) staining by flow cytometry. Baseline and 12-month follow-up data were collected and analysed. Statistical analyses were conducted using IBM SPSS and GraphPad Prism.

Results

Baseline analysis revealed a significant reduction in NK cell cytotoxicity in Australian veterans with GWI (n=21, mean 55 years ± 1.07) compared to HCs (n=18, mean 40 years ± 2.43) ($p<0.05$). Preliminary data of the 12-month follow up data also indicated a significant reduction in NK cell cytotoxicity between Australian veterans with GWI (n=10, mean 54 years ± 1.08) compared to HCs (n=10, mean 43 years ± 3.5) ($p<0.05$). However, there was no significant difference within groups between the baseline and 12-month follow up time points.

Conclusions

This research aims to characterise the underlying pathophysiology of GWI in comparison to HCs. The consistent findings of reduced NK cell cytotoxicity in Australian Gulf War veterans with GWI over time suggests that it is a key feature in immune dysregulation. Ongoing research will further investigate potential alterations in NK cell phenotypes, degranulation and production of lytic proteins.

A Pilot Study of the Feasibility and Acceptability of Using Virtual Reality for Anxiety and Stress Management with Inpatient Former Serving Australian Defence Force Members in a Mental Health Hospital

Mr Murray Nankivell[1]

1 *Military And Emergency Services Health Australia, Glenside, Australia*

Biography:

Murray is currently a Research Officer at Military and Emergency Services Health Australia and is a PhD candidate in the College of Education, Psychology, and Social Work at Flinders University. He has extensive experience working within trauma population research, leading the VR meditation program within an inpatient veteran hospital and has also been a member of the research team investigating the supports available to first responders and their families following the suicide of a first responder in Australia.

Murray's PhD, commenced in 2025, is focusing on first responder help seeking behaviours.

His passion for this space derives from his significant family history currently and formerly serving within both the military and first responder occupations.

Murray's previous affiliations include the University of Adelaide, and the Freemasons Centre for Male Health and Wellbeing.

Introduction
The COVID-19 pandemic has strained healthcare systems especially in inpatient settings, where in cases individuals may resist therapeutic intervention. Virtual Reality (VR) therapy is increasingly recognized as effective, particularly in addressing issues in inpatient settings like anxiety and stress. Combining traditional psychological approaches with digital technology has shown promise, with VR users reporting greater therapy engagement, positive experiences, and improved outcomes. VR serves as a non-pharmacological complement to usual care. Some studies indicate that VR-guided meditation can reduce anxiety in veterans, highlighting its potential usefulness in this population. However, there's a significant gap in evidence concerning VR's efficacy for veteran populations, especially in inpatient settings. As such, this study sought to evaluate the feasibility, acceptability, and impact of a virtual reality meditation program among inpatients at a veteran mental health hospital.

Methods
This mixed-methods pilot investigation utilizes self-report measures and qualitative interviews of inpatient former serving Australian Defence Force personnel at a veteran mental health hospital in Adelaide, South Australia. Participants were invited to complete six, 15-minute sessions of the VR program TRIPP over a two-week period. TRIPP offers immersive, meditative experiences aimed at inducing calmness. It generates visually dynamic environments for guided meditation, incorporating interactive breathing exercises with breath visualization, procedurally generated music, and guided reflections. Measures of anxiety, stress, depression, and anger were collected before and after the two-week period. Additionally, semi-structured interviews examining perceptions, experiences, perceived impact of the program were conducted. Emphasizing triangulation, changes in self-report scores supported the qualitative findings assessing acceptability, feasibility, and impact of a VR meditation program in a veteran mental health hospital.

Results
Results of this pilot study highlight issues in feasibility, such as hospital admission/discharge timeframes, hospital staff capacity requirements, and the number of sessions required. However, qualitative data around the experiences of veterans accessing the VR indicate that despite limitations, they found the program to be valuable. Additional constructive and insightful considerations for future studies will be discussed.

Conclusions
This study informs the feasibility of VR supporting wellbeing for inpatient veterans, offering insights about the ongoing, safe, and therapeutic implementation of both VR specifically for veteran and mental health inpatient participants. Given that hospitalization is a stressful and anxiety-provoking situation for any individual, the information sharing from this study may be transferrable to use of VR relaxation technology in other inpatient settings.

Active Choices for Springfield: A Veteran-led Digital Program to Support Physically Active and Connected Lifestyles in a Priority Regional Australian Community

Dr Nicholas Gilson[1], Dr Rebecca Mellor, Dr Lauren Ball, Dr Catherine Haslam, Dr Zoe Rutherford

1 The University Of Queensland, Australia

Biography:

Associate Professor Nick Gilson is the lead and principal investigator for the Active Choices for Veterans initiative. He is an affiliate senior researcher in the Health and Wellbeing Centre for Research Innovation, based in the School of Human Movement and Nutrition Sciences, at The University of Queensland. He is widely published in high impact journals, and an internationally recognised expert in developing and evaluating physical activity programs for priority, hard-to-reach groups. Nick has extensive experience as principal investigator on multiple grants and has worked with 1000s of community end-users to co-design and translate PA solutions for physical and psycho-social health outcomes. Examples of successful industry and government collaborations he has led include co-design of physical activity support programs (in-person and digital) with multiple partners that have included The Department

of Veterans' Affairs, the Queensland Government, Exercise and Sports Science Australia, and The Australian Physiotherapy Association.

Rationale and aim
Australian Defence Force (ADF) veterans are significantly less physically active than the general population, placing them at increased risk of chronic health conditions such as anxiety, depression, and cardiovascular disease. This disparity is often rooted in social isolation experienced during the transition from military to civilian life, particularly in regional communities where access to tailored physical activity (PA) support is limited. Springfield, a rapidly growing regional hub in Queensland, is home to a growing veteran population facing these challenges. Active Choices for Springfield aims to address this inequity by developing and evaluating a veteran-led, community-based digital PA program that fosters social connection and supports active lifestyles in the Greater Springfield region.

Key partnerships
This initiative is a collaborative effort between The University of Queensland, Gallipoli Medical Research (GMR), Springfield City Group, and the Queensland Government through Health and Wellbeing Queensland and the Queensland Centre for Mental Health Research. GMR, our major partner, has awarded a $250,000 grant to The University of Queensland to deliver the program over two years (2025-27), leveraging its expertise in biopsychosocial research into veteran health and wellbeing.

Methodology
The project builds on a proven hardcopy in-person program previously implemented in metropolitan areas, adapting it into a digital format and online platform. The digital program will be co-designed with veteran end-users and community stakeholders to ensure relevance and accessibility. Central to the program are trained community veteran champions who will lead delivery and foster peer support networks. A train-the-trainer model will be employed, enabling participants to become future champions and expand the program's reach. A rigorous multi-method research design will be used to evaluate the program's effectiveness, including process evaluation, iterative feedback from a veteran advisory group, and oversight by a research steering committee comprising industry and government representatives. This approach ensures the program remains responsive to user needs and evolves as a 'living repository' of PA opportunities and community connections.

Impact on veteran health and wellbeing
Regular participation in PA is associated with numerous physical and psychosocial health benefits. Based on previous trials of Active Choices with older, inactive veterans in metropolitan Brisbane, the new digital program is expected to enable at least a 70-minute/week increase in moderate-to-vigorous PA among Springfield-based veterans. This increase will help participants move closer to meeting national PA guidelines (>150 minutes/week), while also enhancing social connectivity during the critical transition from Defence to civilian life. The program incorporates evidence-based behaviour change techniques such as action planning, barrier identification, problem-solving, and—most importantly—social support. Promoting shared social identity through veteran-led activity groups will provide psychological resources like role modelling, connection, and encouragement, which are essential for PA adoption and maintenance. This strong community-based support network is a particularly innovative aspect of the program, helping veterans navigate the loss of long-standing military ties and build new, meaningful connections.

Transforming PA support services
Currently, ADF veterans must either pay for or be referred to clinical PA services, or rely on generic, self-directed online resources. Active Choices for Springfield offers a unique, free, inclusive, and community-based alternative—delivered by veterans, for veterans. Transitioning from hardcopy to digital delivery is a significant advancement, especially for reaching disadvantaged groups and creating virtual networks that combat isolation. The program can be delivered in-person or virtually by community champions. At scale, it has the potential to become an interactive, online 'one-stop shop' for PA engagement, connecting thousands of veterans across Australia. Post-project, the model may be upscaled nationally and internationally, including through partnerships in the United Kingdom, extending its impact to veteran communities worldwide.

Aeromedical Evacuation of Vietnam Level 2 Hospital in the UN Peacekeeping Mission in South Sudan

Dr Viet Anh Le[1]

1 Vietnam Military Medical University, Viet Nam

Biography:

Academic Degree:

- Medical Doctor (Aug.2008).

- Master of Science in Medicine (2011).

- PhD in Medicine (2019).

Current Positions:

Chief and Surgeon of Field Surgery Center, Military Hospital 103, Vietnam Military Medical University (VMMU), Hanoi, Vietnam.

Previous Employment:

Sep. 2001- Aug. 2008: Medical Student, VMMU.

Sep. 2008- Dec. 2011: Resident doctor, Master Medicine Student, Researcher in Department of CardioThoracic Surgery, Military Hospital 103, VMMU.

Dec. 2011 – May 2022: Surgeon, Researcher in Department of CardioThoracic Surgery, Military Hospital 103, VMMU.

May. 2022 – Jul. 2023: Senior medical officer (SMO) – Vietnam Level 2 Hospital Rotation 4 – UN Mission in South Sudan (UNMISS).

Nov. 2023 – Present: Chief and Surgeon of Field Surgery Center, Military Hospital 103, Vietnam Military Medical University, Hanoi, Vietnam.

Objective
To evaluate the results of the aeromedical evacuation of the Vietnam Level 2 hospital in the UN peacekeeping Mission in South Sudan from October 2018 to July 2025.

Subjects and methods
A retrospective study, cross-sectional and non-colloquial description of 65 patients evacuated by Aeromedical of Vietnam Level 2 Hospital - South Sudan according to UN regulations, from 10/2018 to 7/2025.

Results
Age < 40 years old (96.92%), the proportion of women was 13.84%, the armed forces were the main (83.08%), and 27.7% could not communicate in English. The majority of transportation is Routine MEDEVAC (56.93%). The cases are Diseases and non-battle injuries – DNBI, of which the majority are internal diseases (64.62%), the most are cardiovascular diseases: 16.92%, trauma-wounds: 13.84%. 06 cases of infectious diseases, including two patients diagnosed with severe COVID-19.

Conclusion
The Vietnam Level 2 hospital has completed aeromedical evacuation in South Sudan, ensuring compliance with UN procedures and transporting patients in a timely and safe manner without accidents or complications during transportation.

Keywords
Aeromedical evacuation, Level 2 Hospital, UNMISS

Air Dominance or Not: The Casualty Outcome

Prof Mansoor Khan[1], Dr Jonathan Kendrew[1]

1 Iqarus, United Arab Emirates

Biography:

Professor Mansoor Khan is a highly accomplished trauma surgeon, academic, and retired Surgeon Commander of the Royal Navy, where he served with distinction. With a career spanning military medicine, trauma care, and humanitarian operations, he has been at the forefront of emergency and disaster medicine in some of the most challenging environments worldwide.

After retiring from the Royal Navy, Professor Khan transitioned into global health and remote medical services, currently working with Iqarus, a leading provider of healthcare solutions in complex and high-risk settings. In this role, he applies his extensive expertise in trauma, emergency medicine, and crisis response to deliver life-saving care in conflict zones, natural disasters, and austere environments.

A respected educator and researcher, Professor Khan has contributed to advancements in trauma surgery and military medicine, mentoring future generations of surgeons. His dedication to improving medical systems under extreme conditions has made him a key figure in both military and humanitarian healthcare.

The survival and long-term outcomes of combat casualties are heavily influenced by the availability of medical evacuation (MEDEVAC) capabilities and the ability to provide Prolonged Field Care (PFC) in resource-constrained environments. When military forces possess air superiority, rapid evacuation via

helicopter or fixed-wing assets enables timely delivery of Damage Control Surgery (DCS) and Damage Control Resuscitation (DCR), significantly improving survival rates. However, in contested or denied airspace where ground evacuation is the only option, prolonged evacuation times and limited en-route care contribute to higher mortality and increased morbidity among severely injured personnel.

We examine the critical role of PFC in bridging the gap between point-of-injury care and definitive treatment when MEDEVAC is delayed or unavailable. In such scenarios, advanced pre-hospital interventions, including haemorrhage control, advanced airway management, and extended critical care monitoring, become essential to sustaining casualties for hours or even days. Historical data from asymmetric conflicts demonstrate that forces reliant on ground evacuation experience worse outcomes due to extended transit times, limited mobility, and vulnerability to ambush, leading to higher rates of preventable death and long-term disability.

Our experience highlights the need for enhanced PFC training, portable medical technologies, and adaptable trauma protocols to mitigate the risks of delayed evacuation. Strategies such as forward-deployed surgical teams, telemedicine support, and blood product storage in austere settings can partially compensate for the absence of air MEDEVAC. Ultimately, military medical systems must prepare for both high- and low-resource evacuation environments, recognizing that air superiority is not guaranteed in future conflicts. Proactive investment in PFC capabilities can reduce mortality and morbidity when evacuation timelines are extended, ensuring mission readiness even under logistically constrained conditions.

An Outbreak of Norovirus: Management Considerations in a Military Setting

Dr Meena Nachiappan, Dr Jordan Breed

Biography:

FLTLT Meena Nachiappan is an Aviation Medical Officer posted to No. 2 Expeditionary Health Squadron at RAAF Base Tindal. She completed her MBBS in December 2018 and FRACGP in March 2023. She has participated in domestic and international exercises as medical support to flying squadrons. Her areas of interest include public health, women's health, chronic disease management and aviation medicine. She was the medical officer onsite overseeing management of the above norovirus outbreak.

Introduction

In September 2024, an outbreak of norovirus took place at a remote Royal Australian Air Force Base during a flying exercise. Within 24 hours, 23 cases of fever, diarrhoea and vomiting sought medical attention – all of whom had landed on the base within the two days prior on a Military C17. The medical officer reported the outbreak to local public health authorities. Relevant cases were identified and managed, control measures were implemented to prevent further transmission, investigations were conducted to identify the source, and findings were communicated to the local public health unit and the members' originating health centre. The hypothesised source of the outbreak is the inflight meal on the C17, given a known concurrent outbreak associated with the common meal preparation facility, with person to person transmission accounting for later cases.

Methods

25 cases from the squadron cohort of 82 were identified against an outbreak case definition and were interviewed using a structured questionnaire. The diagnosis of norovirus was confirmed through positive stool samples from three of the cases. An outbreak cohort study was conducted to test the hypothesis that the inflight meal served on the C17A on 04 SEP 24 was the source of infection.

Results

Of the 25 cases, one was excluded from the analysis due to missing data on consumption of the inflight meal. Results of the analysis revealed a strong and statistically significant association with illness and consumption of inflight meal on C17 (RR 19.34, 95% CI 2.7-136.5, $P<0.05$).

Discussion

On declaring the outbreak, a rapid response team was established and immediate control measures were implemented, including re-rooming asymptomatic members, arrangement of an isolation bathroom and isolation of members until 48 hours post symptom resolution. Following implementation of control measures, only two further cases were diagnosed. The outbreak was declared over following deep cleaning of all facilities and 48 hours after symptom resolution in the final case. This emphasises the importance and efficacy of empirical control measures for norovirus outbreaks.

The results of this retrospective outbreak cohort study support the hypothesis that the source was the inflight meal prepared at a facility associated with a concurrent norovirus outbreak in another jurisdiction. This reinforces that commercial kitchens

are common sources of norovirus outbreaks and emphasises the importance of strict adherence to food safety and hygiene standards.

Australian Contributions to the Military Medicine Panel (TP22) of the Five Eyes Science & Technology Collaboration

Brigadier Michael Reade[1], Ms Tanja Farmer[1]

1 Joint Health Command, Canberra, Australia

Biography:

BRIG Michael Reade

Brigadier Reade is an intensive care physician, anaesthetist and clinician scientist, appointed in 2011 as the inaugural Professor of Military Medicine and Surgery at Joint Health Command. Since 2022 he has been Head of the Greater Brisbane Clinical School of the University of Queensland. He remains an advisor to Joint Health Command on research and education, represents Australia on the NATO Blood Panel, and Chairs the Five Eyes Science & Technology Collaboration Military Medicine Panel. His research programs cover trauma systems design, blood and fluid resuscitation in trauma, and traumatic brain injury.

Ms Tanja Farmer

As Director of Health Research at Joint Health Command, Ms Farmer leads a team responsible for health and medical research with strategic and operational significance to the ADF. Ms Farmer represents Australia in the Five Eyes Science & Technology Collaboration Military Medicine Panel. Through partnerships internal and external to Defence, research outcomes are translated into evidence-based policies that maximise Defence capability. Prior to joining the APS, Ms Farmer was a physiotherapist with a focus on orthopaedics and amputee rehabilitation. She holds a Masters in Health Service Management from Monash University and a Bachelor of Science with Honours from the University of Adelaide.

The Five Eyes Science & Technology Collaboration (formerly The Technical Cooperation Program, TTCP) is Australia's most important link to the Defence-related laboratories of our partner nations. Commencing in 1957 as a bilateral agreement between the United Kingdom and the United States, the first Declaration of Common Purpose recognised "the concept of national self sufficiency is now out of date. The countries of the free world are interdependent and only in genuine partnership, by combining their resources and sharing tasks in many fields, can progress and safety be found.". Australia joined TTCP in 1965, sharing the goal of extending its military research and development capabilities at minimal cost, to avoid duplication and to improve interoperability. Australian involvement is led by the Defence Science and Technology Group, with the Chief Defence Scientist as Australia's Principal.

Australia's contribution to Technical Panel 22 (Military Medicine) is led by Joint Health Command. The Panel seeks to improve operational readiness and mitigate against the detrimental health effects of military service through collaborative research on prevention, diagnosis, and treatment in four Focus Areas: Combat Casualty Care, Rehabilitation Medicine, Military Operational Medicine and Force Health Protection. Under these topics currently sit five Activity Plans, each of which contains several collaborative projects:

1. optimising and providing alternatives to blood transfusion (specific projects: fibrinogen concentrate, freeze-dried plasma, cryopreserved platelets, whole blood)
2. minimising injury in training (effects of iron deficiency, optimal rates of physical conditioning, impact of arduous military training on immune and metabolic function)
3. mechanisms to make best use of biobanked samples (audit of preclinical samples held by the partner nations)
4. reducing and mitigating military-specific occupational exposures (repetitive low level blast, non-freezing cold injury, flying duties during pregnancy, prophylaxis for intestinal illness)
5. overcoming regulatory impediments to data-sharing (harmonising approaches to lifecourse studies, harmonising regulations on use of "big data")

TP22 aims to provide a mechanism for all military-affiliated clinicians and researchers to work collaboratively, making use of the protection of intellectual property afforded by the TTCP Memorandum of Understanding, twice-yearly TTCP meetings, and endorsement of projects submitted for military funding in any of the partner nations. Australian and New Zealand researchers with questions of military relevance are invited to work with their national representatives in achieving these aims.

Benchmarking Civilian Capability for Supporting Military Communities: Developing and Validating the Military Informed Cultural Competency (MICC) Scale Across the Five Eyes Nations

Dr Liz Saccone[1,2], Ms Madelaine Green[2], Dr Julie Mattiske[2], Dr Henry Bowen[1,2]

1 *Military and Emergency Services Health Australia, Adelaide, Australia*

2 *Flinders University, Bedford Park, Australia*

Biography:

Dr Liz Saccone is a quantitative researcher with a background in veteran health and wellbeing, psychology and cognitive neuroscience. She has extensive experience in both public health and academic research settings across Australia and the United States. At MESHA, Liz supports investigations into the health and wellbeing of military veterans and emergency service members and their families, including evaluations of support programs and suicide postvention strategies.

Introduction

Current and former military personnel, along with their families, form a unique cultural community shaped by shared values, experiences, and challenges of military life. Civilian professionals — such as healthcare workers, employers, educators, and government staff — are increasingly aware of the need for military cultural competency: the ability to understand, engage with, and effectively support military-connected individuals. Despite this growing recognition, there are few validated tools available to measure this competency, and existing tools are often limited to healthcare settings or tailored specifically to the American military context. This research addresses this gap by developing and validating the Military Informed Cultural Competency (MICC) Scale — a tool designed to assess civilian cultural competency across multiple professional sectors and the Five Eyes nations: Australia, New Zealand, Canada, the United Kingdom, and the United States.

Methods

The study followed a three-stage process:

1. Development of the initial MICC items based on existing literature & identified competency domains.
2. A three-round Delphi survey with 25 international experts from the Five Eyes countries to refine items, achieve consensus, and establish content validity.
3. Psychometric testing of the final MICC Scale with civilian participants (n > 1600) recruited via Prolific, all of whom will be civilians with no prior military service, were over 18, and fluent in English. Psychometric properties examined included internal consistency, inter-rater reliability, and validity testing (content, face, convergent, construct, concurrent, and discriminant), alongside an exploratory factor analysis. Analyses will be conducted overall and stratified by country to assess cross-national applicability.

Expected Results

The final MICC Scale that underwent psychometric testing comprised 41 items rated on a 5-point Likert scale (strongly disagree to strongly agree). The tool was expanded from an initial 37-item draft through the expert consultation in the Delphi process, ensuring relevance across different military contexts. Psychometric testing is anticipated to demonstrate high internal consistency, strong factor structure, and robust validity across all Five Eyes nations. Results will be presented, including recommendations for implementation and benchmarking for civilians working with military communities.

Conclusion

The MICC Scale represents the first validated, internationally applicable tool for measuring military cultural competency in all civilian professionals across the Five Eyes nations. It provides governments, service providers, educators, and NGOs with a standardised approach to assess and improve culturally informed practice. The MICC Scale supports tailored training, workforce development, and international benchmarking, while enabling cross-national research and policy collaboration. Its validation represents a critical step in improving service access, reducing barriers to care, and strengthening culturally competent support for military-connected populations.

Bi-lateral Nation Surveillance of Cardiovascular Disease and Diabetes Risk in Papua New Guinea

CAPT J. Chellappah[1,2], MAJ G. Goina[3], CAPT J. Lama[3], MAJ K. Mond[3], CAPT J. Vovore[3], MAJ T. Naig[3], CPL A. Trudgian[1], LTCOL B. McPherson[1] and LTCOL P. Kaminiel[3]

1 ADF Malaria and Infectious Disease Institute (ADFMIDI)

2 University of Queensland, School of Public Health

3 Health Services Directorate, PNG Defence Force

Biography:

Dr Jessica Chellappah is the senior 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 and Training engagements in Thailand, Malaysia, Philippines, Samoa and Papua New Guinea as an ADFMIDI Infectious Disease Research Officer, as well as conducting local surveillance and research of infectious diseases in ADF training sites around Australia in collaboration with UQ and Metro North-PHU.

Aims

In response to public health concerns of high mortality due to lifestyle diseases, several physiological and biochemical tests were performed to assess risk and prevalence cardiovascular disease and diabetes among current PNGDF as a cross-sectional study design in Lae 2023, Port Moresby 2024 and Wewak 2025. Results would inform priority of prevention and management strategies in this population.

Methods

The following were collected from PNGDF who consented:

Physiological measures

- Height and weight - calculated BMI
- Body Fat%, Muscle Mass(kg), Abdominal Visceral mass (kg), Bone Mass (kg)
- Average of 3 consecutive sitting blood pressure (BP) readings (systolic BP, Diastolic BP and resting heart rate) using OMRON automated BP device
- Waist and Hip circumference (cm) to measure waist to hip ratio.

Biochemical measures

- HbA1c from non-fasting venous blood collection measured with Abbot Point of Care AFINION 2 Analyser
- Lipid profile (Total Cholesterol, HDL, LDL and Triglycerides) from non-fasting venous blood collection measured with Abbot Point of Care AFINION 2 Analyser

To analyse the data, mean values were collected for summary baseline values. To investigate correlation of risk factors, Pearson's Co-efficient and Regression Analysis was performed, adjusting for independent variables and 2-tailed probability.

Results

A total of 650 PNGDF participated in these measurements. The mean age of the population was 37 years of age (min. 21, max. 61).

Summary of findings and recommendations:

- Non-HDL lipids and waist: hip circumference ratio are known predictors with more than ¾ classed at risk for both.
- Systolic and Diastolic blood pressures are known predictors with more than ¼ classed as high to mild hypertensive, and a large proportion classed as lower than healthy range.
- HbA1c (%) is a known predictor with almost ½ classed as pre-diabetic.
- Visceral fat (kg) is a known predictor with almost ½ classed as overweight.

Summary Analysis

This sample size is a third of the full size of the force. There were no significant differences in risk found between sites.

Based on cluster analysis on measurements, W:H ratio or BF% and Visceral Fat (kg) were a better measure of Metabolic Syndrome and Obesity than BMI.

Based on the high number of pre-diabetics and high BP, management strategies need to target those in pre-category as well to prevent escalation in the diagnosed category in the next 2-3 years. The target age group was identified as 30-39yrs of age.

Reducing abdominal fat and improving dietary choices are recommended points of focus for management strategies. Physiological measures of benefit to use for monitoring and managing of members include blood pressure, waist to hip ratio and Visceral fat mass.

Outcomes
The study successfully identified lifestyle risk factors pertaining to this population. Capacity building ensued with Lifestyle disease management clinics set-up on various bases. Specifically chosen physiological and biochemical measures were also included as part of annual PNGDF Medical Board Assessment and this led to further population risk assessment and policy changes within PNGDF Health Services. Population-specific interventions and public health messaging are currently jointly being produced, including nutritional cookbook, posters and pamphlets.

Bridging Military and Civilian Disaster Deployments: Lessons from the USNS Comfort

A/Prof Derrick Tin[1,2,3], Ms Terri Antonio[1]

1 *Serco, Australia*

2 *National Leadership Preparedness Initiative, Boston, USA*

3 *Disaster Medicine Fellowship, Boston, USA*

Aims
This abstract explores the intersection between military and civilian disaster medicine through the lens of humanitarian deployments aboard the USNS Comfort. It aims to compare and contrast the protocols and frameworks utilised by military operations with those of civilian disaster response systems, highlighting potential conflicts, challenges, and strategies used to address these differences. The objective is to contrast how lessons learned on deployments can be adapted to enhance preparedness, resilience, and coordination in disaster response during complex emergencies.

Methods
This qualitative analysis draws upon the author's personal experiences and professional observations during deployments on the USNS Comfort, including pre-deployment, on-deployment, and post-deployment phases. Key areas of focus include:

Deployment Challenges and Preparedness: The physical and psychological challenges encountered during deployments, including moral injury and the need for robust pre-deployment preparation. Lessons learned highlight the importance of situational awareness, structured pre-deployment checklists, and mentorship to mitigate deployment risks. The complexities of managing logistics, immunisations, medical clearances, and international coordination.

Civilian-Military Collaboration in Practice: Successful coordination between military operations (USNS Comfort) and civilian organizations, including non-governmental agencies. Effective frameworks for collaboration, communication, and resource sharing are examined, emphasising the importance of clearly defined mission goals and adaptable governance structures.

Dangers of Humanitarian/Disaster Work – Engaging Civilians in Potentially Threatening Environments: The inherent risks of deploying into austere environments, including potential threats faced by civilians and aid workers. Strategies for improving safety include threat awareness training, collaboration with local authorities, and developing ethical guidelines to balance security concerns with humanitarian objectives.

Results
The approaches employed during USNS Comfort missions demonstrate valuable lessons for enhancing civilian-military disaster preparedness. Observations highlight the importance of robust command structures, coordinated communication systems, and flexible operational health support. These insights offer guidance for strengthening civilian-military disaster response and collaboration.

Conclusions
Bridging the gap between military and civilian disaster medicine requires collaboration, knowledge exchange, and adaptability. Drawing on the author's experiences aboard the USNS Comfort, this abstract highlights strategies for enhancing resilience, preparedness, and ethical decision-making in civilian-military disaster response.

Chemoprophylaxis and Personal Protection Measure Compliance in Australian Military Personnel: Lessons from a 2022 Scrub Typhus Outbreak

Dr Rebecca Suhr[1], Mrs Samantha Belonogoff[1]

1 *ADFMIDI, Arana Hills, Australia*

Biography:

CAPT Samantha Belonogoff recently transitioned to RAAMC as an Infectious Disease Researcher, having previously served as the Research Nursing Officer at the ADF Malaria and Infectious Disease Institute. Within the Clinical Studies and Surveillance department, Captain Belonogoff conducts clinical

research and epidemiological surveillance of vector-borne diseases and other military-relevant pathogens, working to translate research findings into policy recommendations that enhance force health protection across the ADF.

MAJ Rebecca Suhr is the current Research Medical Officer at the ADF Malaria and Infectious Disease Institute. Coming from a background of Close and General Health within Army, she is focused on communicating current research findings and disease surveillance information to actionable steps for clinicians and health planners.

'Doxy only works if you take it!' - Barriers to prophylaxis uptake amongst soldiers.

During the 2022 outbreak of scrub typhus at Cowley Beach Training Area (CBTA), ADFMIDI clinicians had the opportunity to gather information regarding their perceived and actual barriers to uptake of provided chemoprophylaxis and personal protective measures against vector and environmentally borne diseases. This mixed-methods investigation examined survey responses from over 70 participants (15 cases and 57 exposed personnel) from Brisbane and Townsville battalions.

Come and find out why soldiers don't adhere to their prescribed doxycycline regime or wear permethrin-treated uniforms, and what clinicians, health planners and commanders can try and implement moving forward to protect our force.

Clinical Characteristics of Australians with Gulf War Illness: Three Decades On

Dr Natalie Eaton-fitch[1], Dr Etianne Martini Sasso[1], Prof Sonya Marshall-Gradisnik[1]

1 *National Centre for Neuroimmunology and Emerging Diseases, Health Group, Griffith University, Australia*

Biography:

Dr Natalie Eaton-Fitch is a post-graduate research fellow at the National Centre for Neuroimmunology and Emerging Diseases with 9 years research experience in the field of myalgic encephalomyelitis/ chronic fatigue syndrome (ME/CFS), and more recently long COVID and Gulf War Illness (GWI). Dr Eaton-Fitch has investigated epidemiological, immunological and ion channels disturbances in Australians living with these conditions. This research has resulted in multidisciplinary research collaborations to further contribute to the knowledge of disease pathomechanisms. Dr Eaton-Fitch's recent research has focused on the investigation of off-label low dose naltrexone as a potential treatment for ME/ CFS and long COVID and further elucidating the role of ion channel dysfunction in pathomechanism of disease using innovative technology including high throughput applications.

Background

Renewing epidemiological research is crucial to provide new insights into disease progression, the effectiveness or current clinical practice, and patient quality of life (QoL). This is increasingly important to address continuing health challenges in an aging population. A prime example is Gulf War Illness (GWI) also referred to as Chronic Multisymptom Illness. GWI is potentially disabling and is reported in approximately one-third of veterans who served in the Persian Gulf War (1990-1991). While reports have detailed the health impacts of Australian Veterans in the Gulf War, there are limited peer reviewed publications in existence investigating GWI in an Australian cohort. Therefore, this pivotal research aims to provide updated insights into the clinical presentation and health impacts of Australians with GWI.

Methods

This observational investigation is currently underway at the National Centre for Neuroimmunology and Emerging Diseases. Australian Veterans with GWI were recruited to respond to an extensive questionnaire distributed via RedCAP. Participants reported on medical history, routinely administered medications, details of their service and enrolment, symptom presentation and QoL using validated research tools such as the 36-item short form health survey (SF-36) and World Health Organization Disability Assessment Schedule (WHODAS). This abstract details results obtained from n=55 of a growing cohort of veterans with GWI fulfilling the Centre for Disease Control and Prevention criteria.

Results

All research participants were male and aged 56.5 years (SD=8.91). Comorbid diagnoses reported post-GWI onset included PTSD (n=12, 21.8%), recent or current malignancy (n=10, 18.2%), arthritis (n=6, 10.9%), and asthma (n=4, 7.3%). Notable occurring symptoms were found to be chronic fatigue (n=45, 91.8%), memory disturbances (n=45, 81.8%), body pain (n=50, 90.9%), sleep disturbances (n=49, 89.1%), and gastrointestinal disturbances (n=40, 72.7%). Symptoms including memory disturbances, fatigue, body temperature dysregulation, and genitourinary disturbances were more likely to be severe in nature. Lastly, research participants

reported significant impacts to QOL. Most impact SF-36 domains included general health (20.91 ± 14.99) and Vitality (34.43 ± 21.44); while more severe impacts to functioning were reported in WHODAS domains interpersonal relationships (54.53 ± 36.19) and participation in life activities (45.37 ± 26.04).

Conclusion
These findings indicate the continuing, and potentially significant, impacts of GWI on health outcomes. Therefore, this expanding research project demonstrates the need for further research to ensure Australian veterans with GWI receive appropriate care and recognition.

Critical Care Retrieval in the RAN

CMDR Scott Squires[1], CMDR Peter Smith

1 RAN, Sydney, Australia

Biography:

CMDR Scott Squires is an Emergency Physician with the Australian Defence Force (ADF) Medical Specialist Program. Scott is posted to the Maritime Operational Health Unit, HMAS Penguin as the Director of Clinical Services. Over the past 27 years of service, he has deployed extensively overseas in remote and austere environments, throughout the Middle East and Asia-Pacific regions.

CMDR Peter Smith is Anaesthetist with the ADF Medical Specialist Program, posted to MOHU. CMDR Smith is a senior Retrieval MO in the civilian sector. CMDR Smith has extensive operational experience in the middle east and Asia-Pacific regions.

Over the past 5 years MOHU has been developing its Critical Care Retrieval capability. This has largely been via the development of key equipment, training of personnel and progression of SOP's. This progression has been born from an operational requirement during RPD and HADR deployments.

The presentation will discuss: key equipment which includes the development of a MOHU Retrieval Pack CES and equipment cache; training of critical care MO's, NO's and Medics and the progression of SOP's in areas such as carrying blood products, point of care testing and providing a critical care capability far forward, in the littoral space.

Challenges and limitations will be discussed as will progression of this capability.

Deep Frozen Blood Products, the RAN Experience, from Inception to a Deployed Capability

CMDR Scott Squires[1], CDRE Anthony Holley, CAPT Jessica Inskip

1 RAN, Sydney, Australia

Biography:

CMDR Scott Squires is an Emergency Physician with the Australian Defence Force (ADF) Medical Specialist Program. Scott is posted to the Maritime Operational Health Unit, HMAS Penguin as the Director of Clinical Services. Scott originally entered the ADF as part of the Graduate Medical Scheme. Over the past 27 years of service, he has deployed extensively overseas in remote and austere environments, throughout the Middle East and Asia-Pacific regions.

CDRE Anthony Holley AM is the Principal Consultant, Trauma to the SGADF. CDRE Holley is a Senior Staff Specialist at the Royal Brisbane and Women's Hospital. CDRE Holley has deployed extensively and is the Chair of the ADF Blood Expert Panel.

CAPT Inskip is a Pathology Officer posted to MOHU. CAPT Inskip has deployed throughout the Asia-Pacific region. She has a keen interest in blood product management and in particular, the deep frozen blood capability.

Uncontrolled haemorrhage is the leading cause of death in battlefield casualties. It has consistently been recognised that 15-20% of battlefield casualties will require blood product resuscitation and each patient, on average will utilise 8 units of whole blood or whole blood equivalents.

There are significant challenges in the provision of blood products in remote and austere environments. Short shelf-life, cold chain constraints and safe storage especially for certain products such as platelets means that balanced haemostatic resuscitation is potentially not feasible.

One approach to address this challenge is the employ of deep frozen blood products. Deep Frozen Blood Products have a shelf life ranging from 2-10 years, and once thawed, are able to facilitate haemostatic resuscitation. Deep Frozen Blood products may also assist with contingency planning when logistic constraints result in supply failure or when there are requirement surges..

The US Navy has deployed with deep frozen blood products for decades and the Netherlands Military Blood Bank has been producing deep frozen

products since 1996 and used deep frozen products extensively and safely in Afghanistan from 2006-12.

Since 2010, the ADF has been developing its deep frozen blood product capability.

This presentation considers the development of this capability from its inception, to 2024, when the capability was deployed for the first time during overseas maritime operations.

The presentation will consider the role of deep frozen blood products, models for use. Advantages and limitations will be discussed, in the context of present and future ADF maritime operations.

Defence SafeSide Project: Supporting Defence's Changing Culture in Suicide Prevention through a System-Wide Approach. Preliminary Data from Workforce Education Evaluations

Ms Jennifer Harvey[1], Ms Kylie Druett[1], Ms Tiyana Gostelow[2], Mr Dan Mobbs[2], Ms Sarah Donovan[3], Professor Anthony Pisani[3]

1 *Department of Defence, Australia*

2 *SafeSide Prevention, Australia*

3 *SafeSide Prevention, United States of America*

Biography:

Jennifer Harvey (Assistant Director Mental Health and Suicide Prevention Initiatives at Defence) is an experienced psychologist and educator. Her 13 year career with Defence has included working with members to optimise their mental health and wellbeing; and collaborating with health professionals supporting workforce upskilling. She's the Defence lead for the creation and customisation of Defence's SafeSide training.

Kylie Druett is a psychologist and acting/Director of the Mental Health and Wellbeing Initiatives Directorate at Defence. She is responsible for the development and implementation of initiatives that empower personnel and the organisation to improve the mental health and wellbeing. Her career spans non-government and state health services in the sectors of domestic violence, child protection, suicide prevention, sexual assault, mental health and AToD. Outside work she advocates for systemic reform in support offered to families bereaved by domestic violence homicide.

Tiyana Gostelow (Director of Operations at SafeSide Prevention) leads the delivery and implementation of SafeSide Prevention programs, services, and consultancy across Australia. A seasoned leader with expertise in system redesign, co-design, and evidence-informed implementation from her 25+ years in public health and the not-for-profit sector. Over the past year, Tiyana has worked with the Defence team to implement the Defence SafeSide Project.

Defence is dedicated to strengthening suicide prevention across the Enterprise through a system-wide approach that prioritises safety, early identification, and compassionate support.

Suicide is preventable and Defence is advancing significant reform by embedding evidence-based, whole-of-organisation approaches that reach beyond traditional health settings. At the core of this approach is an understanding that everyone – regardless of role – can contribute and make a meaningful difference in our efforts to prevent suicide.

In partnership with SafeSide Prevention, Defence is implementing a unified, prevention-oriented model that empowers our people across the Enterprise to recognise and respond to suicide-related distress. All the supporting artefacts, policies, templates and education products have been co-designed with people who have lived experience, ensuring that our approach is inclusive, practical and culturally aligned with Defence. This has enabled us to tailor the SafeSide Framework for Suicide Prevention and CARE (connect, assess, respond, extend) Model to our clinical system and beyond.

Most training is delivered in person, uses Defence personnel and Defence-specific scenarios to ensure the content looks, feels, and sounds relevant to those who serve. Tailored training packages include:

- CARE-RF/DRF for mental health clinicians and medical officers: This training supports formulation-based clinical decision-making using a prevention-oriented lens. This includes the exploration of foreseeable changes, and contingency planning as part of member-centred safety planning. Extending member networks outside of health, is another key component of this model.
- CARE-LM for leaders and managers: Specific training explores their role in both enhancing key protective areas and collaborating with health to support members at risk in line with the CARE Model.
- CARE-S for health practitioners (not responsible for MH risk assessment), chaplaincy and wellbeing support staff: This training introduces the SafeSide Framework for Suicide Prevention

and CARE Model and equips non-clinical personnel to identify signs of concern, initiate compassionate conversations, and provide a warm-handover for a clinical assessment while extending support to complement the health response.

This presentation will share preliminary evaluation data and insights on self-efficacy, learning transfer, use, and attitudes about the systems approach across the SafeSide training packages. Defence is proud to lead globally in being the first military organisation across the globe to implement a systems approach inclusive of a prevention-oriented risk-formulation approach.

Effective Conversations in Complex Environments: A Relational Model for Human Rights and Operational Leadership

Mr. Max Stephens[1]

1 Max Stephens High Performance Coaching Conversations, Australia

Biography:

Max Stephens is a Developmental Theorist, Published Author, and Ontological Coach with extensive experience guiding industry leaders across sectors in navigating complex conversational and ethical challenges. His work operates at the intersection of epistemology, behavioural science, and performance psychology, offering a deep understanding of human development and its real-world applications. Max supports leaders globally in becoming more construct-aware, enhancing their capacity to recognise and work with the mental frameworks that shape perception, decision-making, and moral reasoning. His approach integrates integral theory, systems thinking, and effective conversational practice, grounded in a developmental understanding of human meaning-making. His research and coaching emphasise the importance of aligning human development with the vertical (structural) and horizontal (contextual) dimensions that influence how individuals and institutions interpret morality, dignity, and responsibility. His work is especially relevant for leadership roles within complex, pluralistic environments, where psychological flexibility, ethical clarity, and developmental intelligence are critical to long-term effectiveness.

This thesis introduces the Relational Rights Model (RRM), a developmental framework for enhancing the clarity, relevance, and uptake of human rights discourse across culturally and psychologically diverse populations. Drawing from developmental psychology, including Kohlberg's moral stages, Kegan's model of evolving consciousness, and Spiral Dynamics' mapping of cultural value systems, the RRM addresses a persistent yet underdiagnosed issue in global rights communication: epistemic mismatch, the structural disconnect between how rights are conveyed and how they are understood. The RRM positions human rights as meaning-making processes, contingent on the moral reasoning and epistemology of the audience. By identifying five distinct stages of rights interpretation, the model provides a practical tool for tailoring communication, advocacy, and leadership training to developmental realities, rather than assuming uniform moral readiness. While designed for broad global applicability, the model holds relevance for institutions operating in complex moral terrain, such as defence, law enforcement, and humanitarian fields, where leaders are frequently required to engage across divergent cultural, moral, and sense-making systems. In such contexts, developmental misalignment can contribute to operational breakdowns, disengagement, and ineffective relating. The RRM offers a framework for anticipating and mitigating these risks through structurally informed communication and leadership practice. By offering a metatheoretical lens for diagnosing where and why rights discourse fails, the Relational Rights Model contributes a new tool for advancing more inclusive, intelligible, and developmentally coherent human rights education and leadership development.

Effective Integration of Military and Civilian Aeromedical Evacuation Teams: A Case Report on the Retrieval of a Critically Unwell Patient from Lord Howe Island

Dr Samuel Perotti[1]

1 Royal Australian Air Force, Richmond, Australia

Biography:

FLTLT Samuel Perotti is a medical officer in the Royal Australian Air Force having joined in 2015 as part of the graduate medical program training scheme. He is a fellow of the Royal Australian College of General Practitioners and holds a bachelor of medical science with honours, medical doctor degree, and graduate diploma in child health. He has been posted to 3 Aeromedical Evacuation Squadron (3AES) at RAAF Base Richmond, Sydney, NSW since January 2022. Over this time he has completed training in

aviation medicine, numerous aeromedical evacuation missions, exercises and operations overseas, while also conducting clinical duties in Australia at military health centers and civilian emergency departments. At 3AES he additionally fills the role of A9 cell flight commander for the unit's clinical governance, standards and evaluation team. He has a passion for interoperability in the AE space and collaborates regularly with international military partners on international exercises and through working groups.

Background
The aeromedical evacuation system in Australia is multifaceted, incorporating rotary and fixed wing assets that are operated by commercial, state, national and military organisations. Each organisation operates within their own command and control structure in support of their specific jurisdictions and patient dependency. Differences in crew selection and tasking mechanisms reflect this complexity. However, situations inevitably arise that require collaboration between these organisations.

Case
On the 17th of April 2024, New South Wales Ambulance (NSW Ambulance) was tasked to retrieve a critically unwell civilian patient from Lord Howe Island. NSW Ambulance requested assistance from the Royal Australian Air Force (RAAF), which was supported through activation of a C-27J military transport aircraft and a retrieval team from 3 Aeromedical Evacuation Squadron (3AES) based at RAAF Base Richmond, NSW. At short notice, clinicians from NSW Ambulance and 3AES created a joint team, which was able to successfully complete the time-critical mission. RAAF military personnel maintained command of the mission elements and NSW Ambulance were the clinical lead, assisted by the 3AES critical care specialists and retrieval team. RAAF medical equipment was utilised, with the addition of a Hamilton ventilator and medications contributed by NSW Ambulance. The integrated team deployed within five hours of receiving the request for assistance. The patient was safely transferred off Lord Howe Island to an appropriate health facility and there were no significant issues in flight.

Discussion
Effective command and control, clear communication with task delegation, and appropriate crew selection were the key factors enabling mission success. Challenges encountered related to coordination of the various teams involved, crew fatigue management, equipment selection with waivers required, and the need for satellite phones to communicate on Lord Howe Island. These issues were effectively addressed in a timely manner. This mission demonstrated effective integration of military and civilian aeromedical evacuation systems, with the lessons identified forming a strong foundation for future collaborations of this kind

Empowering Health Literacy in Veterans and Veterans' Families: Findings from a Mix-Methods Study

Dr Sanket Raut[1,2], Dr Tho TH Dang[1,2], Dr Camila Guindalini[1,2]

1 *Gallipoli Medical Research, Greenslopes, Australia*
2 *School of Medicine, The University of Queensland, Herston, Australia*

Biography:

Dr Sanket Raut is a Research Fellow at the Gallipoli Medical Research (GMR), based at Greenslopes Private Hospital in Brisbane. Dr Raut works within the Healthy Veterans Research Program at GMR where his research is focused on quality use of medicines in veterans to improve pharmacological management of PTSD. With a background in medicine, pharmacology and neuroscience, Dr Raut's work bridges clinical care and basic research.

His current research explores patterns of psychotropic and opioid medication use in veterans with mental health conditions. He is the lead investigator of a multi-phase program examining health literacy, and digital health tools development to support informed decision-making in mental healthcare.

He is passionate about reducing preventable harm from polypharmacy, promoting evidence-based prescribing, and ensuring veterans receive coordinated care. Dr Raut has published in leading journals including (Nature) Translational Psychiatry, Journal of Psychiatric Research, Pharmacology and Therapeutics and presented his work at national and international conferences.

Background
Veterans experience higher rates of health issues such as post-traumatic stress disorder, chronic pain, and comorbid physical and mental illnesses. Together with their families, they have more complex support needs than the general population. Health literacy, the ability to access, understand, and use health information, is critical for achieving better health and wellbeing outcomes. Little is known about health literacy among Australian veterans and their families. This study aimed to identify health literacy needs and co-design a resource to improve

healthcare engagement among Queensland veterans and their families.

Methods
This study used a mixed-method, three-phase design. In Phase 1, an anonymous online survey was conducted using the validated Health Literacy Questionnaire. It consisted of 44 items across nine domains of health literacy: feeling understood by healthcare providers (HCPs), having sufficient information to manage health, actively managing health, social support for health, appraisal of health information, actively engaging with HCPs, navigating the healthcare system, finding good health information, and evaluating health information to support decisions.

Phase 2 involved semi-structured focus groups conducted online, in-person, and in hybrid formats to explore survey findings in depth and capture lived experiences. A thematic analysis was used to identify common experiences, barriers, and enablers related to health literacy.

Phase 3 translated these findings into a health literacy education package, co-designed with veterans and family members, and delivered through expert-led videos.

Results
A total of 190 veterans and 44 veteran family members participated in the survey. Both groups demonstrated ability in understanding health information (mean scores of veterans: 3.69/5; families: 4.13/5), in actively engaging with HCPs (veterans: 3.48/5; families: 3.66/5), and in finding good health information (veterans: 3.48/5; families: 3.92/5). However, they reported lower scores in the finding social support (veterans: 2.71/4, families: 2.77/4) and navigating the healthcare systems (veterans: 3.28/5, families: 3.48/5) domains. Family members consistently reported higher scores across most health literacy domains. Veterans with post-secondary education scored significantly higher in locating and understanding health information than those without ($p < 0.05$). This educational difference was not observed among family members.

Five focus groups were held: three with veterans (11 participants) and two with family members (7 participants). Through thematic analysis, five key themes were identified: Challenges navigating the healthcare system including fragmented care, unclear DVA processes, and difficulty accessing appropriate services. Many veterans struggled to build trust and communicate effectively with healthcare providers. Barriers from military culture such as stigma and internalised reluctance to disclose health issues. Information gaps where participants noted difficulty in finding trustworthy health information. Lastly, family members often acted as informal case managers but lacked the knowledge and support to navigate systems effectively.

Despite these challenges, participants voiced a strong desire for accessible, plain-language, and trustworthy digital resources to support management of common veteran health issues and to advocate effectively for themselves and their families.

Based on these findings, a suite of three digital education videos was developed. The package provides educational content on health literacy basics, navigating healthcare systems, and finding appropriate professional and social support. To maximise reach, the videos will be distributed through social media and official stakeholder websites targeting Australian veterans and their families.

Conclusion
The findings underscore the multifaceted health literacy challenges faced by veterans and their families, shaped by military culture, systemic barriers, and gaps in accessible information. By integrating quantitative and qualitative insights, and applying co-design principles, we developed practical, culturally relevant tools that reflect lived experience. These resources offer a scalable model for future initiatives, including the development of a mobile app designed to enhance health literacy and improve health and wellbeing outcomes for Australian veterans and their families.

Enhancing Expeditionary Health Skills via Bush Dentistry

FLTLT Alexis Dieu [1]

1 RAAF, Darwin, Australia

Biography:

FLTLT Alexis Dieu completed a Bachelor of Biotechnology (Honours) in Drug Design and Development in 2008. She spent seven years working in ISO17025-accredited laboratories, contributing to preclinical drug development and pain research. Motivated by a desire for more direct clinical impact, she transitioned from academia to dentistry, completing her dental training in 2018. Over the past four years, while posted in Darwin, she has worked closely with the Northern Territory Government to deliver oral health services to remote Indigenous communities across the NT. In 2023, she

spearheaded the development of a remote clinical placement program to strengthen dental teams' expeditionary readiness and clinical capability in austere, resource-limited environments. This initiative significantly enhanced her operational preparedness and played a key role in the successful delivery of oral health services during Exercise Kummundoo 2024 in Kununurra, remote Western Australia.

Bush dentistry is a colloquial term referring to the delivery of oral health services in remote Indigenous communities of the Northern Territory (NT), Australia. In addition to the typical challenges associated with remote healthcare, such as security concerns, logistical limitations, and constrained access to resources, health professionals must also navigate language and cultural barriers unique to each region.

Depending on the size of the community, local health centres often provide capabilities comparable to Role 1 enhanced military health support, including aeromedical evacuation. I have led teams comprising myself and a dental assistant to multiple austere locations across the NT, delivering dental care and engaging with communities on behalf of both the Northern Territory Government and the Royal Australian Air Force (RAAF).

This form of service delivery closely parallels Humanitarian Assistance and Disaster Relief (HADR) operations, exposing dental personnel to complex case management outside the typical Defence demographic. It also serves as a valuable training opportunity, fostering core expeditionary competencies such as resilience, adaptability, task and time management, clinical confidence, decision-making, teamwork, interoperability, and effective communication.

In this presentation, I will highlight the unique advantages and challenges of operating in remote NT health clinics, and discuss how these experiences cultivate critical thinking and problem-solving skills—key attributes for developing agile, effective leaders in both military and civilian health contexts.

EX Kummundoo 2024

FLTLT Alexis Dieu [1], Mr Rayneil Shandil[2]

1 Royal Australian Air Force, Darwin, Australia

2 Royal Australian Air Force, East Sale, Australia

Biography:

FLTLT Alexis Dieu completed a Bachelor of Biotechnology Hons in Drug Design and Development with 7 years' experience in ISO17025-accredited laboratories, contributing to preclinical drug development and pain research. She transitioned from academia to dentistry and completing her dental training in 2018. Over the past four years, while posted to Darwin, she has worked closely with remote health service providerso deliver oral health services to remote Indigenous communities across the NT and WA. In 2023, she spearheaded the development of a remote clinical placement program to strengthen dental teams' expeditionary readiness and clinical capability in austere, resource-limited environments.

FLTLT Rayneil Shandil is an Environmental Health Officer specialising in occupational hygiene and garrison support during field exercises and deployments. He holds a Bachelor of Science (Forensic Science), a Bachelor of Natural and Applied Science (Environment and Health), a Diploma in Quality Auditing, and certifications in occupational hygiene, emergency management, and WASH in emergencies. Formerly serving in local government, he gained valuable community-focused experience. Currently a Course Leader at Officers' Training School, he is committed to mentoring future Air Force leaders. His qualifications and operational experience reflect a strong dedication to health protection and capability development within the ADF.

Exercise Kummundoo is a Royal Australian Air Force (RAAF) initiative that supports Aboriginal and Torres Strait Islander communities across Australia. As part of the Whole of Australian Government's Closing the Gap strategy, the program has run for over a decade, deploying Air Force personnel to deliver essential services focused on health and well-being in remote communities.

The 2024 iteration marked the exercise's tenth anniversary, featuring expanded community engagement and a multidisciplinary health team comprising Indigenous Liaison Officers, Dental Officers, Dental Assistants, Medical Technicians, a Chef, a Physical Training Instructor, and Environmental Health Officers. The team provided enhanced oral health services, environmental health support, and health education to community members of all ages and backgrounds.

This presentation highlights the achievements, challenges, and contributions of the 2024 team during their deployment to Kununurra, Western Australia. Exercise Kummundoo continues to exemplify partnership, mutual respect, and shared learning, as Air Force personnel work alongside communities to deliver meaningful and lasting support.

Immunohistochemical Imaging Characteristics of Thermoregulatory Neurons in an Experimental Rat Model with Heat Stroke

Dr Van Thu Nguyen[1]

1 Vietnam Military Medical University, Hanoi, Viet Nam

Biography:

Education

2005 September – 2007 September: VIETNAM MILITARY MEDICAL UNIVERSITY - Vietnam

2007 October – 2008 August: ROSTOV STATE MEDICAL UNIVERSITY - Russia

2008 September – 2014 June: SIBERIAN STATE MEDICAL UNIVERSITY - Russia

2017 April – 2017 July: RUSSIAN MILITARY MEDICAL ACADEMIA - Russia

2020 April – 2023 March: JUNTENDO UNIVERSITY - Japan

Work experience

2015 March – 2023 April: Teaching Assistant - Department of Military Occupational Medicine - Vietnam Military Medical University

2019 October -2020 March: Visiting Research Fellow - Juntendo University

2020 April – 2023 March: Research Assistant - Institute of Health and Sports Science & Medicine - Juntendo University

2024 April - Present: Head of the department - Department of Naval Medicine - Vietnam Military Medical University

Journal article

1. *Potential role of signal transducer and activator of transcription 3 in the amygdala in mitigating stress-induced high blood pressure via exercise in rats. DOI: 10.1111/apha.14274*
2. *Involvement of D1 dopamine receptor in the nucleus of the solitary tract of rats in stress-induced hypertension and exercise. DOI: 10.1097/hjh.0000000000003809*
3. *Impact of exercise on brain-bone marrow interactions in chronic stress: potential mechanisms preventing stress-induced hypertension. DOI: 10.1152/physiolgenomics.00168.2022*
4. *Platelet activation in rabbits with decompression sickness. DOI: 10.22462/10.12.2020.9*

Background

Heatstroke is a life-threatening emergency defined by excessive hyperthermia, multiorgan dysfunction, and central nervous system impairment. Although management strategies have improved, the cellular mechanisms underlying heat-induced neuronal injury remain unclear. GABAergic neurons in the hypothalamic thermoregulatory center are thought to play a crucial role in homeostasis under thermal stress, yet their morphological changes during heatstroke are largely uncharacterized.

Objective

This study aimed (1) to establish an indirect immunofluorescence staining protocol for detecting heat-sensitive neurons in rat brain tissue using NeuN and GABA markers, and (2) to characterize immunohistochemical alterations of these neurons in experimental heatstroke.

Methods

Ten adult male Wistar rats (220-238 g) were randomly assigned to a control group (n = 5) or heatstroke group (n = 5). The heatstroke group was exposed to 43 °C and 70% humidity in a microclimate chamber until heat shock or death, defined by core temperature ≥42.2 °C and/or arrhythmia. Core temperature and ECG were continuously recorded. Blood was collected for hematological, biochemical (AST, ALT, urea, creatinine, CK), and electrolyte analyses. Brain tissue slices (40 μm, bregma -1.72 to -1.92 mm) were stained using NeuN and anti-GABA antibodies, with Alexa Fluor 488 and 594 secondaries. GABA-positive neurons were quantified with Fiji-ImageJ. Data were analyzed with SPSS 22.0; significance was set at $p < 0.05$.

Results

Heatstroke rats showed a rapid rise in core temperature ($p < 0.05$), sustained tachycardia, and a significantly higher LF/HF ratio (0.47 ± 0.15 vs. 0.27 ± 0.09; $p < 0.05$). ECG abnormalities appeared after 30 minutes, with significant intergroup differences in R-wave amplitude and JT interval. Hematology revealed increased red blood cell count, hemoglobin, and hematocrit ($p < 0.05$), with reduced MCHC and granulocytes ($p < 0.05$). RDW was significantly higher ($p < 0.05$). Biochemistry showed elevated AST, ALT, and urea ($p < 0.05$). Electrolytes revealed hyperkalemia, while SpO_2 declined at 60 and 90 minutes ($p < 0.05$). Immunohistochemistry revealed marked neuronal alterations. GABA-positive cell counts were higher in heatstroke rats (90 ± 15.8 cells/mm²) than controls (36 ± 24.1 cells/mm²; $p < 0.01$). Mean neuronal size increased significantly (25.6 ± 10.9 μm vs. 10.6 ± 3.1 μm; $p < 0.05$). Both count and size correlated positively with peak core

temperature, indicating a direct relationship between hyperthermia and neuronal alterations.

Conclusion
An indirect immunofluorescence protocol for heat-sensitive neurons was successfully established. Heatstroke induced significant quantitative and morphological changes in hypothalamic GABAergic neurons, characterized by increased number and swelling consistent with cellular edema. Significance: These findings provide novel evidence that GABAergic neurons play a central role in thermoregulation under extreme heat stress. The correlation between neuronal alterations and hyperthermia suggests a protective adaptive mechanism. This study advances understanding of neuronal responses to heat stress and offers insight for future research on the neuropathology of heatstroke and potential therapies targeting GABAergic pathways.

Keywords
Thermoregulatory Neurons, Heat stroke, IHC, Rat.

Introducing MyCred: Elevating Workforce Credentialing, Compliance & Efficiency

Ms Narelle Basham[1], Ms Terri Antonio[1]

1 Serco, Australia

Biography:

Narelle Basham, RN, RM, AICGG, MAppMgt(Nurs), PGDipMidwifery, GradCertPeriOp, ProfCertHSM BNsg, DipPM, DipProfW&E

Head of Clinical Capability, Serco

Narelle is an experienced and committed clinician with a strong background in compliance, credentialing, management and projects. She has over three decades of experience in the Healthcare sector across public and private settings. As a healthcare professional, she is committed to delivering optimal outcomes for the customer while driving quality and safe healthcare with innovation and integrity. Narelle is the primary expert in relation to Serco's credentialling and compliance platform, MyCred, and led the development and implementation of the system.

Terri Antonio, RN, DipPsych, GCertNsg, MMgnt, FCHSM CHE, AACN, MAPNA, AICGG.

Director Clinical Governance, Serco

Terri is a Registered Nurse and an experienced, certified health executive with over 40 years' experience in the Healthcare sector. Terri joined Serco in 2016 where she holds responsibility for the organization's clinical governance systems, processes and performance. Her focus is on supporting growth, innovation, and high functioning teams, to enhance consumer, client and community outcomes.

Ensuring a properly credentialed and compliant workforce is imperative. It not only meets regulatory standards and assures quality but also mitigates risks, builds trust, fosters employee growth, and fulfills legal obligations. Serco has invested in the development of a bespoke credentialing compliance tool – MyCred, designed to streamline and enhance the management of credentialing and compliance. The platform offers a consolidated view of initial candidate credentialing and ongoing employee compliance. It facilitates readily available workforce composition, capability and conformance data whilst promoting organisational efficiency.

MyCred offers a comprehensive solution that enables the configuration, assignment, real-time tracking, and monitoring of both candidate and employee workforce requirements. It allows individual requirements to be defined and assigned based on organisational, contract, location, or role level specifications.

The platform offers a user-friendly interface for both candidates/employees and organisational administrators. Candidates and employees are able to directly view all requirements that apply to them, access instructions relating to the requirements, and identify when they are due. They can review and complete each requirement, including uploading evidence, making declarations, or filling in inbuilt forms before submitting for organisational administrators to review and approve. MyCred includes a messaging and notification tool that allows two-way communicate and sending of customisable, automatic notifications and reminders.

MyCred includes a transparent and comprehensive audit trail of all activities across all touch points within the platform. Every data point within MyCred can be extracted and exported to reporting tools such as Power BI. This provides an opportunity to harvest and analyse real time workforce composition, capability and conformance data and metrics.

Gone are the days of spreadsheets tracking compliance, multiple folders for storing evidence, and reliance on email communications. MyCred now provides Serco with a secure, customisable, user-friendly platform to track, monitor and evidence all credentialing and compliance requirements.

Lymphatic Filariasis and its Changing Regional Picture - Summary of the New DHM Chapter

Dr James Smith[1,2], Dr Rebecca Suhr[1]

1 ADFMIDI, Brisbane, Australia

2 Queensland Health, Brisbane, Australia

Biography:

MAJ Rebecca Suhr is the current Research Medical Officer at the ADF Malaria and Infectious Disease Institute. Coming from a background of Close and General Health within Army, she is focused on communicating current research findings and disease surveillance information to actionable steps for clinicians and health planners.

MAJ James Smith operates at the intersection between clinical medicine, public health and health systems management. He combines expertise in vaccinology, epidemiology, public health regulatory systems and health data analysis to assist the ADF in communicable disease policy.

The changing epidemiology of lymphatic filariasis due to regional efforts towards eradication in the Pacific has led to a review of the Defence Health Manual Lymphatic Filariasis chapter. A summary of the changes and rationale will be presented. This will include consideration regarding disease pathology, symptomatology and progression, exposure risks and timelines, and screening and treatment recommendations including recommendation against routine provision of eradication therapy for ADF personnel.

We aim to allow clinicians and health planners to become familiar with this policy change and to better understand the reasoning behind its implementation.

Optimising Knee Imaging Pathways in the ADF: Balancing Clinical Best Practice with Operational Requirements

Danielle Addison[1]

1 Bupa ADF, Service Delivery Optimisation, Australia

Biography:

Danielle Addison is a health strategy and insights professional with expertise in health economics, clinical data translation, and service quality reporting. She is currently a Program Manager at Bupa Asia Pacific, where she leads initiatives to improve healthcare delivery through evidence-informed reporting, health intelligence dashboards, and stakeholder collaboration.

Previously, Danielle worked in the Health Technology Assessment team at the NHMRC Clinical Trials Centre, University of Sydney, evaluating pharmaceuticals and medical devices for the Department of Health. Her research has been published in the Journal of Resuscitation and presented internationally, including at ISPOR Europe.

She began her career at PwC Australia in public policy and health economics, where she contributed to national health reforms, including the development of Australia's first National Digital Mental Health Framework and economic analyses that supported Federal Health Budget processes.

Danielle holds a Bachelor of Economics from the University of Sydney, majoring in Economics and Mandarin. She has also completed further study in clinical trials, epidemiology, and data analytics.

She is passionate about using data and evidence to drive meaningful improvements in healthcare access, quality, and outcomes, particularly within complex environments such as ADF and DVA health services.

Background

Knee pain is one of the most common musculoskeletal complaints in the Australian Defence Force (ADF), with implications for deployability, force readiness, and longer-term function. Clinical decisions regarding knee pain- particularly the use of imaging- are directly linked to surgical utilisation. Overuse or underuse of imaging, as well as deviation from clinical guidelines, may identify potential areas of low value care and unwarranted variation across regions. Understanding these patterns is critical to improving care quality and ensuring alignment with evidence-based practice.

In the civilian health sector, the Australian Commission on Safety and Quality in Health Care (ACSQHC) developed the Atlas of Healthcare Variation (AoHV) to identify unwarranted clinical variation and promote more consistent, evidence-based care. This study applies the AoHV methodology to the ADF population, with the aim of understanding patterns of knee imaging use, adherence to national clinical guidelines, and operational factors unique to the defence context that may drive divergence from standard care pathways. Findings will support the development of value-based healthcare pathways tailored to the ADF, with the aim of enhancing care quality and patient outcomes.

Methods
Using the ACSQHC AoHV approach, a retrospective analysis was conducted to understand imaging utilisation for knee pain in the ADF population from 2020 to 2023. The review used invoicing data to examine imaging utilisation patterns across multiple modalities including ultrasound, MRI, X-ray and CT for both traumatic and non-traumatic knee pain. Utilisation trends were standardised against the Australian population for comparison, noting the unique characteristics of ADF personnel, and stratified by geographic regions, service lines, age, and gender. Additionally, national evidence-based imaging guidelines were reviewed against utilisation trends, including the clinical appropriateness of first line and follow-up investigations.

Results
ADF members showed a higher utilisation rate of knee imaging for knee pain than the broader Australian population, especially for MRI and among members aged 50 years and over. This trend may reflect higher service expectations, access arrangements and clinical emphasis on maintaining force readiness. Females also showed higher imaging rates, potentially linked to injury risk, health-seeking behaviour, or different reporting practices.

Geographic and service-level variation also emerged, with some sites showing higher imaging intensity that may reflect local capability or clinician preference rather than member factors alone. Ultrasound use was variable with some evidence of overuse of application outside of guideline recommended indications. Imaging pathways often lacked a consistent stepwise approach and were not always clearly aligned with national guidance, although in some cases divergence in the ADF population may be appropriate due to operational imperatives.

Overall, the findings suggest both opportunities to address potential low value care and the need to contextualise variation considering ADF-specific operational requirements.

Conclusions:
While knee imaging pathways in the ADF differ from civilian norms, these differences are not always inherently inappropriate. Higher utilisation of imaging modalities, especially a costly service such as MRI, may be justified by the need for timely diagnosis, deployment readiness, and to meet expectations of serving or transitioning members. However, variation in practice and misalignment with evidence-based pathways point to areas where care can be optimised.

Applying the AoHV framework provides a powerful lens to identify variation, promote quality care, and enhance value in the delivery of imaging services. There is strong value in understanding patient journeys and continuous monitoring of imaging pathways for delivery of best practice care that improves patient outcomes. Additional analysis overlying DVA claims data may help map post-service care, inform longitudinal pathway design, and improve stewardship of resources across the service lifecycle.

Outcomes of Percutaneous Administration of Platelet-Rich Plasma as an Independent Treatment for Long Bone Aseptic Nonunion among Military Personnel: A Case Series

MAJ Andrie Lorenzo Ortega, CPT Marlon Mejia, Dr Antonio Manuel Saludo

1 Department of Orthopedic Surgery and Traumatology - V Luna General Hospital, Quezon City, Philippines

Biography:

Andrie Lorenzo F. Ortega, MD, FPOA

I am board-certified orthopedic surgeon with over seven years of clinical practice, specializing in trauma, and degenerative joint disorders. A Fellow of the Philippine Orthopedic Association, I currently serve as Consultant for the Orthopedic Adult and Trauma Section at V. Luna General Hospital, and a Visiting Consultant in several medical centers including PNP General Hospital, Recuenco General Hospital, San Mateo Medical Center, St. Victoria Hospital, and Gen. Malvar Hospital.

Completed my residency in Orthopedic Surgery and Traumatology at the Armed Forces of the Philippines Medical Center, where i also served as Assistant Chief Resident during my senior residency and Ward Officer/Consultant. As a Major in the AFP Medical Corps, I actively engaged in both civilian and military medical service. My contribution to orthopedic research, focused on trauma management, arthroplasty practices, and innovative fixation techniques for non-union fractures.

Introduction
Nonunion occurs when a fracture fails to heal within the anticipated time. Limitations on bone healing management still leaves patients with pain, decreased quality of life, and economical consequences on

patients. Standard of care for nonunion includes bone grafting or revision of implant. These would necessitate re-operation, which is more costly, and has risk for various complications. Studies have proposed percutaneous Platelet rich plasma (PrP) injection as non-invasive management for nonunion.

Materials & Methods
A case series design was employed consisting of 7 patients with nonunion. A 15 mL of blood was centrifuged and processed. Around 5 mL of PRP was administered percutaneously as a single dose.

Bone healing time were assessed with mean and standard deviation from various measurement tool such as Visual Analog Scale, the Disabilities of the Arm, Shoulder, and Hand (DASH) Score and Modified Lane Radiographic Scoring System.

Results
A significant decreased in pain scale was evaluated with improved functionality in all subjects noted through DASH scoring system. Gradual increase in Radiographic score was observed. Average time to achieve union post-administration was 5.25 months.

Five subjects (71%) achieved radiographic and clinical union by the time of their last follow up. Two subjects (29%) displayed gradual progress in terms of bone healing. recanalization and still for monthly re-evaluation where serial dose administration can be started.

Discussions
PRP studies showed success on certain studies with a dose of at least 5 mL. Three of the remaining subjects although displayed gradual cortical formation and recanalization, are still subjected for monthly re-evaluation and can be indicated for serial dose administration. Thus, recommendation for serial dosage can be considered on future studies.

Conclusion
PRP is beneficial and cost-effective management of nonunion providing enhanced bone healing to achieve union, pain control and functionality

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Platelets and Trauma: Not That Straightforward!

CDRE Anthony Holley[1]

1 Australian Defence Force, Brisbane, Australia

Biography:

Commodore Anthony Holley AM, RAN

BSc. MBBCh. DipPaeds. DipDHM. FACEM. FCICM, AFRACMA

Commodore Holley is a dual qualified Emergency Physician and Intensivist at the Royal Brisbane and Women's Hospital.

He is currently serving as the Principal Consultant Trauma to the SGADF.

CDRE Holley is an Associate Professor with the University of Queensland Medical School. He is a former ANZICS President (2019-22). During his

tenure as President, he guided the critical care multidisciplinary professionals through the COVID-19 pandemic. He is a former examiner for the Fellowship of the College of Intensive Care Medicine of Australia and New Zealand. CDRE Holley has authored twelve book chapters, 58 peer reviewed publications. He is a senior Instructor for BASIC and an EMST course director. He is also a director of the Current Concepts in Critical Care course. CDRE Holley serves as a critical care representative for the Australian National Blood Authority in developing the Australian Patient Blood Management Guidelines. He has deployed on active service on multiple occasions, including two tours to Afghanistan, the Persian Gulf (HMAS Toowoomba), border protection, four tours to Iraq, Bushfire assist 2019/20 and as the Senior Medical Officer for the Operation COVID Assist Joint Task Group 629.3.

Exsanguination is responsible for most preventable combat casualty deaths; interestingly even mild thrombocytopenia is associated with a substantial increase in mortality. Massive injury is frequently accompanied by trauma-induced coagulopathy (TIC). The development of TIC coagulopathy is complex, principally resulting from the tissue response to major tissue injury, but also exacerbated by the lethal diamond: cooling, acidosis, dilution and hypocalcaemia.

Platelet function is central to effective coagulation in major trauma. A simplistic view recognises their role in "identifying" trauma, subsequent margination within the vessel flow, resulting in contact with the endothelium, and ultimately forming an important component of the haemostatic thrombus.

The role of platelets in trauma is more complicated and requires recognition that platelets are innate immune particles, acting as vital regulators of inflammation. Platelets are recognised effectors of local and systemic inflammation, expressing a wide array of immune critical receptors.

The immune function may provide an explanation as to why platelet transfusion is not without risk, accounting for 25% of adverse transfusion events and perhaps more importantly why platelet supernatant is efficacious in haemostasis. The challenge in combat casualty care is identifying the optimal transfusion threshold for platelets. Furthermore, platelets are challenging to provide in the austere environment, and hence the interest in cryopreserved platelets and the ongoing efforts to create the "Holy Grail" - an effective, viable, synthetic thrombosome. This presentation will consider the biology, provision and future of platelet transfusion in the care of the combat casualty.

The Difficulties of Malaria Diagnostics in an Austere Environment with an Outbreak Example

Dr Fiona McCallum, Dr Rebecca Suhr[1], Dr Byron Manning,

1 ADFMIDI, Brisbane, Australia

Biography:

MAJ Fiona McCallum is a Scientific Officer and senior veterinarian at the Australian Defence Force Malaria and Infectious Disease Institute (ADFMIDI), Brisbane. Her PhD study involved sero-epidemiological investigation of P. falciparum malaria in a cohort of Kenyan children. She now heads the department of Clinical Studies and Surveillance (CSS), tasked to assist surveillance and molecular investigation of infectious diseases of relevance to ADF personnel within in Australia and regionally. The CSS research team includes clinicians and veterinary, epidemiological and laboratory scientists. Personal research interests are malaria and sero-surveillance of infectious disease.

Malaria is one of the 'must exclude' diseases when patients present with a fever in an endemic area, but what is the most reliable way to exclude?

We will summarise a cluster of 8 malaria diagnoses in ADF soldiers on a UN deployment. We will discuss the benefits and limitations of rapid diagnostic tests, microscopy, and molecular

tests in malaria diagnosis. We will present malaria diagnoses at the cohort rather than the individual level, to highlight diagnostic challenges. This information will benefit health planners and clinicians.

The Maritime Role 2 Forward Concept

CMDR Scott Squires[1], LCDR Anna Kane, LCDR Sarah Wong, MAJ Kyle Bender

1 RAN, Australia

Biography:

CMDR Scott Squires is an Emergency Physician with the Australian Defence Force (ADF) Medical Specialist Program and is posted to the Maritime Operational Health Unit, HMAS Penguin as the Director of Clinical Services. Over the past 27 years of service, he has deployed extensively overseas in remote and austere

environments, throughout the Middle East and Asia-Pacific regions.

LCDR Anna Kane is a Senior NO in the RAN. Anna has extensive operational experience in the middle east and Asia-pacific region.

LCDR Sarah Wong is a Senior Anaesthetist at Westmead Hospital and has deployed on multiple operations in the Asia-pacific region.

MAJ Kyle Bender is a General Surgeon in the ADF Medical Specialist Program and is currently posted to 2 Brigade. MAJ Bender has deployed to the middle east and the Asia-pacific region on multiple occasions.

Damage control surgery is not a new concept, however, the last 25 years has seen a significant progression in this capability.

Forward damage control surgery aims to address immediate threats to life whilst concurrently resuscitating the casualty so that they can be retrieved to a higher echelon of care for further management.

Over many years the Army has be equipped with a forward surgical effect, its present iteration is the R2F. The RAAF has similarly progressed its R2F.

In the RAN, over the last 30 years, the surgical effect has largely been provided in the Amphibious ships, previously the LPA's and at present the LHD's (HMAS Adelaide and Canberra).

The surgical effect is deployed as part of the MR2E which is a large footprint of up to 60 personnel and contained within the medical facility on board.

It was proposed that there was a need to review this as the only means of providing a surgical capability, at sea. It was considered that a light surgical team, a MR2F could provide a damage control surgical effect on other RAN platforms, vessels of opportunity or in the littoral space, as required.

To this end, during Indo Pacific Endeavour (IPE) 24, a MR2F was validated in HMAS Stuart, an ANZAC class Frigate, FFH.

A review of the medical equipment, consumables, team numbers, role allocations and SOP's of the Army and the RAAF R2F was conducted in order to standardise, as much as practicable, across the services.

The aim of this validation was to see if a MR2F capability could be achieved, what limitations exist and todetermine if this capability was viable, moving forward.

The results of this validation will be presented to provide a means for future discussions of the MR2F concept.

The Pilot-RESTORE trial: Driving Innovation in Severe Burns Resuscitation

Dr Elissa Milford[1,2,3,4]

1 *2 Bde HQ, Brisbane, Australia*

2 *Intensive Care Unit, Royal Brisbane and Women's Hospital, Brisbane, Australia*

3 *Monash University, Melbourne, Australia*

4 *University of Queensland, Brisbane, Australia*

Biography:

MAJ Milford is an early career clinician researcher. She is a practicing Intensivist, currently working at the Royal Brisbane and Women's Hospital, and is a full-time Intensive Care Specialist in the Australian Army as part of the Australian Defence Force's Medical Specialist Program. Her PhD was on the role of the endothelial glycocalyx in severe trauma, and she is now building a research program that spans the management of severe burns, trauma, blood transfusion, and endothelial dysfunction in critical illness. She also has a strong interest in the design of novel clinical trials and is currently completing a Master's in Biostatistics.

Background

Future conflicts, especially if involving armored warfare, are likely to feature high numbers of casualties with severe burns. Despite fluid resuscitation being the cornerstone of the acute management of severe burns, there has been limited research and little innovation made over the last 50 years on the ideal fluid type, volume, and resuscitation endpoint in severe burns. The acute resuscitation phase of severe burns presents an additional challenge for combat health care environments. One severely injured burn patient can require up to 10-20 L of IV fluid in the first 24 hours of injury, which is a challenge to supply in austere, resource-limited, distributed operational environments, particularly in the situation of multiple and sustained casualties. Support for the multi-organ failure that results from the burn injury and is exacerbated by the large volume fluid resuscitation is also challenging to provide in the combat environment. However, if the acute vascular hyperpermeability and hyperinflammatory response can be attenuated, this may lead to both a reduction in fluid volume and organ-support requirements, and an improvement in patient outcomes.

Plasma is one of the few therapies demonstrated to consistently and significantly repair the endothelium and attenuate vascular hyperpermeability in preclinical studies, through an unknown

mechanism. In animal studies of burn injuries, early plasma-based resuscitation prevents intra-vascular fluid extravasation into the interstitium, whereas crystalloid has no effect on vascular permeability. Historically, plasma was used extensively for burns resuscitation, but this was ceased in the 1970s due to high rates of viral hepatitis transmission. Even though that risk is now negligible, only ~14% of clinicians report regular use of plasma (in the form of fresh frozen plasma (FFP)) in burns resuscitation and dosage varies. FFP is frequently used in clinical practice and is considered to be a low-risk intervention.

The only randomized controlled trial (RCT) of plasma in burns patients (N=31) found a significant reduction in 24h fluid volume requirement with no adverse events. Observational studies are limited but report associations between plasma use and lower resuscitation volumes and less weight gain (as a surrogate for tissue oedema). High-quality, appropriately powered clinical trials are needed to determine the effect of plasma in burns on patient-centered outcomes. Plasma resuscitation in severe burns has been identified as a high research priority by burns experts and leading international burns organizations including the American Burns Association.

Pilot-RESTORE:

The Pilot-RESTORE trial (a pilot randomised controlled trial of plasma in the RESuscitation of severe burns TO improve patient outcomes by Restoring Endothelial integrity) is the vanguard trial in a program of research that aims to develop innovative therapies and produce high-impact, rapidly translatable evidence to improve outcomes for patients with severe burns. Pilot-RESTORE and the follow-on definitive trial will assess whether a plasma-based resuscitation strategy improves clinical outcomes in severe burn patients and reduces health care resource utilization including fluid volume and organ support requirements.

Led by a Defence clinician, the project brings together researchers and clinicians from all the major adult burns centres in Australia, Australian Red Cross Lifeblood, the Australian and New Zealand Intensive Care Society Clinical Trials Group, the Australian and New Zealand Burn Association, the Australian Defence Force, multiple Australian Universities as well as collaborators from Oxford University in the UK and the University of Pittsburgh in the US. The study will be registered as a Collaborative Project in the Five Eyes Science and Technology (formerly The Technical Cooperation Program) Collaboration.

The results of this study and the follow-on definitive trial are likely to inform clinical guidelines and practice for the use of dried plasma products in environments where FFP is unavailable, including combat care operational environments.

Utilisation of Garrison Health Support in North Queensland

MAJ Jason Selman[1], Ms Ashleigh Broad[1]

1 Joint Health Unit – North Queensland, Townsville, Australia

Biography:

Ashleigh Broad is employed as a contracted Quality Manager at JHU-NQ by BUPA. Ashleigh is a registered chiropractor and has practiced in regional areas throughout Queensland, New South Wales, South Australia and Victoria. She has spent time teaching at Macquarie University and Central Queensland University and is currently completing a Master of Public Health through James Cook University. Her clinical and academic interests include disaster health, health protection and surveillance, women's health, and health service optimisation.

Major Jason Selman is a current serving Army officer posted as the executive / operations officer at JHU-NQ. He has served in surveying, construction, and combat engineer appointments; and saw operational service attached to a US Army engineer brigade in Iraq in 2005 on Operation Catalyst. After a break in service that included employment as a Public Health lecturer at Curtin University in 2013 and 2014, Major Selman returned to the Army where his current academic research interests include the public health determinants of combat capability, and the human performance optimisation of military personnel.

The health service provided to uniformed members of the Australian Defence Force is delivered through two organisations – operational health services such as in the field or at sea by uniformed Defence clinical personnel – or through the Garrison (on-base) Health System for deployment readiness, injury and illness prevention, treatment, and rehabilitation. An examination of health utilisation and deployment readiness data for one regional garrison health unit with a dependency of over 8,000 Army, Navy, and Air Force personnel over a three-year period has revealed considerable variation in the volume and type of garrison health services demanded. The demand was found to be closely tied to the operational tempo of the Defence organisation in that region. The utilisation of

Garrison Health services over the three-year period demonstrated an increase in presentations by the high readiness deployable units in line with a greater number of overseas training serials and an increase in operational readiness requirements. A large proportion of presentations were for ADF members holding a medical classification for which they were temporarily or permanently unable to deploy. Conversely, a substantial proportion of presentations were likely to comply with pre- and post- deployment requirements including administrative compliance for otherwise medically deployable personnel. Reducing these compliance requirements and reducing sick parade presentations through greater use of sick leave approved by the chain of command could release considerable capacity in the Garrison Health system and reduce wait times overall.

Vagaries of Acute Presentations in Military PTSD Admissions

Dr Julie Simes-phillipps[1]

1 Deakin Private Hospital, Deakin, Australia

Biography:

Julie served in the ADF in both full and part time roles for over 20 years prior to moving to a clinical role. Running a PTSD ward for first responders, she is interested in the impact of developmental trauma informing responses to treatment and recovery. By focusing on phenomenology within a biopsychosocial and military cultural frame, a return to accurate psychiatric formulations will reframe most presentations.

Short oral presentation postulating that many PTSD military presentations are rooted in pre-existing developmental trauma precipitating a vulnerability to expressed symptoms.

Current treatment modalities including Psychiatry are inadvertently contributing to perpetuating negative narratives, inadvertently delaying functional recovery.

Segwaying from civilian recovery programs for serious psychiatric conditions (such as in attachment theory principles- HOPE Health Outcomes from Positive Experiences) recommendation for a return to “first principles” care is postulated.

Vector Borne Diseases: Prophylaxis, Vaccination and Eradication Update

Dr Rebecca Suhr[1]

1 ADFMIDI, Brisbane, Australia

Biography:

MAJ Rebecca Suhr is the current Research Medical Officer at the ADF Malaria and Infectious Disease Institute. Coming from a background of Close and General Health within Army, she is focused on communicating current research findings and disease surveillance information to actionable steps for clinicians and health planners.

Doxycycline, malarone, tafenoquine, primaquine – what are the differences? Why one over the other? Do I need to eradicate for helminths? What else does it cover? Is there a vaccine for that?

Let your local friendly ADFMIDI clinicians summarise up to date information for your chemoprophylaxis and vaccination options for military relevant tropical diseases and advise on current recommendations on malarial and helminth eradication on return to Australia.

We will cover advice from commonly encountered queries like; prolonged deployments, frequent short deployments, drug allergies/intolerances, G6PD deficiency and exposure risks.

Women in Surgery – Challenges in Training and Beyond

SQNLDR Jane Kee[1]

1 RAAF, Australia

Biography:

SQNLDR Jane Kee graduated from medical school at the University of Western Australia in 2014 and began working as an Aviation Medical Officer for the Royal Australian Air Force in 2016. During her medical degree and early residency years, Jane had developed a strong interest in surgery. However, after recognising the challenges many women in surgical specialties face, including balancing both work and family, she commenced post-vocational training in General Practice and attained her Fellowship with the Royal Australasian College of General Practitioners in 2020. While Jane appreciates the experiences and lessons that she has gained from General Practice, her interest in surgery has only grown. Now, as part of the Australian Defence Force’s Medical Specialists Program Jane is finally pursuing her dream career

in General Surgery. She is also passionate about creating change for gender equity in surgery so that other doctors may be supported in realising their surgical dreams.

Medicine and in particular, surgery, has traditionally been a male dominated field. Even after women were accepted into medical schools in the early 1900's, they often faced significant difficulty securing a suitable job following training. This trend was also mirrored in the military sphere, and while Australia has come a long way towards achieving gender parity in medicine, surgical specialties still lag behind. In 2023, only 15% of the active surgical workforce were female. This gender imbalance in the surgical world has become a widely discussed topic in recent years. In early 2017, findings from an Inquiry by the Australian Human Rights Commission found that gender segregation in Australia was significantly impacting women's economic security and the high levels of poverty experienced by older Australian women. Several months prior to the publication of this report, the Royal Australasian College introduced gender equity targets as a part of their Diversity and Inclusion Plan. The Australian Defence Force's Gender, Peace and Security Mandate also expresses a commitment to gender equality, human rights and increasing women's participation across all ranks and employment categories. Today, as the need for ready surgical care has become an essential part of medical support for many military operations, examining gender equity in the surgical capabilities we deliver becomes increasingly relevant. This presentation will examine the gender disparity among surgeons, and more specifically, military surgeons, as well as potential strategies to address this.

Notes

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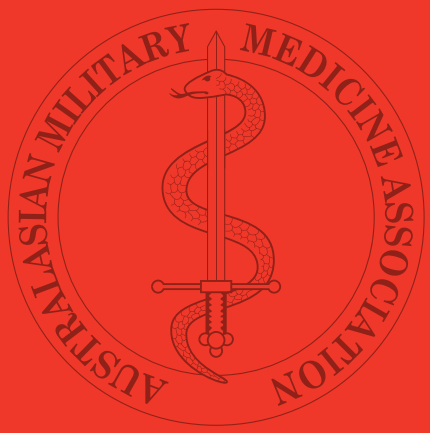

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