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FROM SCIENCE TO SERVICE • DE LA SCIENCE AU SERVICE



ABSTRACTS / RÉSUMÉS

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1. Mental Health and Rehabilitation

Podium Presentations

1A01: Child Abuse and Suicide in Canada: A General Population and Military Personnel Comparison

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Introduction: Military personnel experience both occupational and non-occupational trauma, both of which may contribute to suicidality (i.e., ideation, plans, and attempts). There is recent evidence of a higher prevalence of child abuse victimization in United States veterans, which may partly explain their higher suicide risk relative to civilians. However, the relationship between child abuse victimization and suicidality in Canadian Armed Forces personnel relative to civilians are unknown. In addition, we are not aware of the interrelationships of occupational trauma, child abuse victimization, and suicidality in Canadian Armed Forces personnel. The overall objectives are: a) to determine if a child abuse history is more prevalent among a representative Canadian military sample compared to the general population; b) to compare the association between child abuse history and suicidal ideation, plans, and attempts among military personnel and the general Canadian population; and c) to determine if a child abuse history has an additive or interaction effect on the relationship between deployment-related trauma and suicidal ideation, plans, and attempts among Regular Force military personnel.

Methodology: Data were drawn from two nationally representative datasets collected from respondents aged 18 to 60 years: the 2013 Canadian Forces Mental Health Survey (CFMHS, n = 8,161; response rate = 79.8%) and the 2012 Canadian Community Health Survey-Mental Health (CCHS-MH, n = 15,981; response rate = 68.9%). The military sample consisted of serving Regular Force personnel, almost half of whom had deployed in support of the mission in Afghanistan, as well as serving Reserve Force personnel who had deployed in support of the mission in Afghanistan. Regular Force and Reserve Force personnel were examined separately.

Results: The prevalence of any child abuse victimization was higher in the Regular (47.7%) and Reserve (49.4%) Forces compared to the general Canadian population (33.1%). Child abuse victimization was associated with increased odds of suicidal ideation, plans, and attempts in the general population and military personnel with a general trend of greater effects noted in the general population. Additive effects, but not interaction effects, were noted between a history of child abuse and deployment-related trauma on suicidal behaviour among military personnel.

Conclusions: Individuals with a child abuse history may be more likely to enter the military and child abuse victimization may increase the likelihood of suicide-related behaviour with or without exposure to deployment-related trauma. Personnel with a history of child abuse victimization and deployment-related trauma might be targeted in suicide prevention and control activities.

1A02: Spouse and Family Functioning Before and After a Military Fatality: Comparing Death by Suicide, Combat, and Accident

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Introduction: Family survivors of those who have died by suicide have a more difficult time coping post-mortem relative to survivors of those who die in other ways. This is because suicide is often unexpected, highly stigmatized, and leaves many unanswered questions. Survivors of suicide report problems with guilt, shame, and prolonged grief. These challenges are made worse by a lack of social support often experienced by survivors of suicides. This study examined pre- and post-mortem functioning of military families who experienced the death of a service member by suicide, accident, or in combat.

Methodology: Surviving spouses of those who died by suicide (N = 17), accident (N = 19), and in combat (34) completed a semi-structured interview that included questionnaires and open-ended prompts. Respondents reported retrospectively on various dimensions of their personal and family life in the year prior to, and year following their loved one's death, as well as their current personal and family functioning. The mean duration of interviews was 42 minutes.

Results: In the year prior to their loved one's death, spouse survivors of suicide, relative to those whose spouses died in combat, reported (a) more family conflict; (b) less family cohesion; (c) lower levels of psychological health and subjective wellbeing; and (d) less satisfaction with the military. In the year following the suicide, spouse survivors reported (a) more feelings of stigma and shame; and (b) more social support from friends relative to survivors of those who died in combat. In terms of current family functioning, spouses of those whose loved ones died by suicide reported (a) higher levels of prolonged grief intensity and (b) higher levels of child conduct problems relative to survivors of those who died in combat. Survivors of suicide reported more post-traumatic growth in terms of seeing new possibilities in the future compared to survivors of those dying in combat.

Conclusion: These findings suggest that, relative to surviving a combat-related death, suicide survivorship is particularly challenging for military families. It also appears that military spouses and families of those who die by suicide may exhibit more problems prior to the death. This presents an opportunity for targeted family intervention in cases where service members have been identified as being at risk for suicide. The study had a number of limitations, including (a) reliance on retrospection, (b) small sample size, and (c) a lack of statistical power.

1A03: Spillover Effects of Parental Stress on Children: Implications for Active Duty Personnel, Veterans and Families

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Introduction: For the last two decades, science has managed to delineate the mechanisms by which stress hormones (particularly glucocorticoid secretion through activation of the hypothalamic-pituitary-axis) can impact on the human brain.

Receptors for glucocorticoids are found in the hippocampus, amygdala and frontal cortex, three brain regions involved in memory processing and emotional regulation. Studies have shown that chronic exposure to stress is associated with reduced volume of the hippocampus and that acute and chronic stress can modulate volumes of both the amygdala and frontal cortex in children, adolescents, and adults.

Methodology: In a set of studies, we measured stress hormones in saliva samples and mental health psychological factors in parents using validated questionnaires.

Results: We showed the presence of a significant positive correlation between stress levels in parents and concentration of stress hormones in their children. A more recent study by our group also showed that depressive symptomatology in parents is associated with changes in amygdala volumes in their children. These results suggest the presence of important spillover effects of parental stress on children.

Conclusion: These results have important implications for populations of active duty personnel, Veterans and their family. In the discussion, I will present education programs tailored for children (*'DeStress for Success Program'*) and adults (*'iSMART'* for mobile phones and *'Stress Inc'* for the web) that have been shown to decrease levels of stress hormones and depressive symptomatology and that could be used by active duty personnel, Veterans and families in order to prevent the spillover effects of parental stress on children.

1B01: Prevalence of Past-year Mental Disorders in Canadian Military Personnel and Civilians: The Challenge of Defining a Civilian Comparison Group

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Introduction: Comparisons of the prevalence of mental disorders in military personnel and civilians are often unsuitable, as the military personnel exhibit a "healthy worker effect" and do not share the same socio-demographic and racial characteristics as the general population, raising methodological and philosophical questions on how one defines a comparable group of civilians. The purpose of this study was to compare the mental health of Canadian Armed Forces (CAF) Regular Force personnel and Canadian civilians with similar profiles in terms of socio-demographic characteristics and adverse childhood experiences by examining differences in the prevalence of past-year major depression episode (MDE), generalized anxiety disorder (GAD) and alcohol abuse or dependence (AAD).

Methodology: Data were obtained from two cross-sectional population-based surveys conducted by Statistics Canada: the 2013 Canadian Forces Mental Health Survey (N=6,696 CAF Regular Force) and the 2012 Canadian Community Health Survey - Mental Health (N=25,113). Using highly comparable methods, these two mental health surveys provide a unique opportunity to compare of the mental health of military personnel and civilians. Past-year MDE, GAD and AAD were assessed using the World Mental Health - Composite International Diagnostic Interview 3.0. The past-year prevalence rates in the military were compared to estimates from a subsample of the general

household population, that (1) was limited to individuals without exclusionary characteristics for military service and (2) was weighted on a range of socio-demographic and child trauma variables to agree with the corresponding variable distributions in the CAF Regular Force. The weights were created using iterative proportional fitting procedure.

Results: Past-year prevalence rates of MDE, GAD and AAD in CAF Regular Force personnel were 7.9%(95%CI: 7.3% to 8.6%), 4.7%(95%CI: 4.2% to 5.2%), and 4.5%(95%CI: 3.9% to 5.0%) respectively, while in the household civilian population with the same socio-demographic and childhood trauma profiles the rates were 3.6%(95%CI: 3.1% to 4.2%), 1.5%(95%CI: 1.1% to 1.9%), and 6.6%(95%CI: 5.9% to 7.2%), respectively. Relative to matched civilians, Regular Force personnel had higher rates of past-year MDE, GAD, and lower rates of AAD.

Conclusion: Significant prevalence differences were found in the two populations, with the past-year MDE and GAD prevalence rates being at least two-fold higher in CAF Regular Force personnel than in their matched civilian counterparts. On the contrary, the rates for AAD were lower than in the matched civilians. Further research is required to understand the disparities in prevalence of these disorders among CAF Regular Force personnel and civilians.

1B02: Perceived Need for Mental Health Care in Canadian Military and Civilian Populations: Implications for Workplace Mental Health

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Introduction: Failure to perceive a need for care (PNC) is a leading barrier to accessing mental health care in civilian and military populations. The Canadian Armed Forces (CAF) has invested heavily in workplace mental health to help members better recognize and meet their needs; yet, the impact of these investments remains unknown. This study compares the prevalence of different levels of perceived need for care (PNC) in the CAF and Canadian civilians, across three epidemiological surveys. This comparison has a two-fold objective: 1) to capture changes in PNC that may have taken place over a decade in the CAF, and 2) to compare PNC between the CAF and Canadian civilians.

Methodology: Data were drawn from the 2013 and 2002 CAF and the 2012 civilian mental health surveys, all conducted by Statistics Canada. These three cross-sectional, population-based mental health surveys yielded nationally representative samples of their respective target populations (total N~40,000). Mental disorders were assessed using the World Health Organization Composite International Diagnostic Interview. Perceived need for mental health care (PNC) was assessed using a validated measure of this construct. Sociodemographic variables were assessed with the nondiagnostic part of the surveys. For the military surveys, only the regular forces were included. First, exclusions were applied to the civilian sample to make them comparable to the military samples. Second, prevalence rates for No Need, Need Met, Need Partially Met, and Need Unmet categories across three service types (Information, Medication,

Counselling) were calculated. Third, a series of binary logistic regressions were conducted, controlling for sociodemographic and clinical variables. Additional analyses (e.g., propensity score matching) were conducted to test the robustness of results.

Results: Reports of any mental healthcare need were higher in CAF regular forces in 2013 than in 2002 (29.37% vs. 21.77%, OR 1.24) and, higher in CAF than in civilians (29.37% vs. 14.36%, OR 2.16). Reports of mental health care needs being fully met were also higher in CAF in 2013 than in 2002 (19.37% vs. 11.98%, OR 2.08) and, higher in CAF than in civilians (19.37% vs. 9.77%, OR 1.08). The results remained unchanged using different analytic approaches, indicating robustness of the results.

Conclusions: These results suggest that investments in organizational and workplace mental health, such as those implemented in CAF, can lead to improvements in recognizing need for mental health care and subsequently, getting those mental healthcare needs met. Implications for both military and civilian mental health are discussed.

1B03: Comparing Mental Health Service Use in Canadian Military and Civilian Populations: Implications for Health-care Systems and Workplace Mental Health

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Introduction: In civilian and military populations alike, the majority of individuals with a mental disorder fail to use mental health services. Over the past decade, the Canadian Armed Forces (CAF) has invested heavily in mental healthcare system renewal and workplace mental health initiatives to increase rates of mental health service use (MHSU) in its members. Yet, the impact of these investments remains unknown. This study compares the prevalence of MHSU in the CAF and Canadian civilians, across four epidemiological surveys, in order to capture changes in MHSU that may have taken place over a decade in CAF, and also in order to compare MHSU across military and civilian populations.

Methodology: Data were drawn from the 2013 and 2002 CAF and the 2012 and 2002 civilian mental health surveys, all conducted by Statistics Canada. These four cross-sectional, population-based mental health surveys yielded nationally representative samples of their respective target populations (total N~80,000). Mental disorders were assessed using the World Health Organization Composite International Diagnostic Interview. MHSU was assessed with questions regarding past-year contact with professionals (e.g., psychiatrist), para-professionals (e.g., religious/spiritual advisor) and non-professionals (e.g., co-workers) for mental health problems. Sociodemographic variables were assessed with the nondiagnostic part of the surveys. For the military surveys, only the regular forces were included. Exclusions were applied to the civilian sample to make them comparable to the military samples. Prevalence rates for MHSU across the three provider categories were calculated. A series of binary logistic regressions were conducted, controlling for sociodemographic and clinical variables. Additional (e.g., propensity score matching) analyses were conducted to test the

robustness of results.

Results: Reports of MHSU were higher in CAF regular forces in 2013 than in 2002 (e.g., for psychiatrist: 6.53% vs. 3.59%, OR 1.42) and, higher in CAF in 2013 than in civilians in 2012 (e.g., for psychiatrist: 6.53% vs. 1.35%, OR 3.65) for all mental health professionals, as well as paraprofessionals and non-professionals. The results remained unchanged across different analytic approaches, indicating robustness of the results. Emerging results from ongoing analyses indicate that the rate of increase in MHSU in the past decade is higher in CAF than in civilians.

Conclusions: These results suggest that investments in organizational and workplace mental health, and mental health system renewal, such as those implemented in CAF, can lead to improvements in rates of MHSU. Implications for both military and civilian mental health are discussed.

1B04: The Attitudes towards Mental Health Care Scale: Its Internal Structure and Association with Services Use

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Introduction: Civilian and military research has consistently shown that only a minority of people with mental health disorders will seek care in any given year (Garber et al., 2012). Because leading barriers to accessing care are predominantly attitudinal, our aim was to examine military members' attitudes towards mental health care via a newly-developed scale as well as its association with services use.

Methodology: We conducted our analyses using the 2013 Canadian Forces Mental Health Survey (CFMHS), a cross-sectional survey that gathered information about the mental health status and perceived need for mental health services in the Canadian Armed Forces (CAF). Data for the CFMHS were collected between April and September 2013 in a joint collaboration by the Department of National Defence and Statistics Canada. Responses were obtained for 6,696 full-time regular members of the CAF and 1,469 reservists (who had been deployed in support of the mission in Afghanistan), resulting in overall response rates of 79.8% and 78.7%, respectively.

Here the focus is on the regular members' responses to the 12-item Attitudes Towards Mental Health Care (ATC) Scale. Respondents indicated the extent of their agreement with each of the 12 statements. Almost all of the items originated from the work of Hoge et al. (2004) as well as from Britt's "Beyond Stigma". A few of those items were re-worded slightly, however, and one item was created specifically for the CFMHS.

Results: We conducted exploratory factor analyses on the 12 ATC items and examined one-, two-, three, and four-factor solutions. The three-factor model resulted in a good fit to the data ($X^2[33] = 662.71$, $p < .001$; RMSEA = .053, 90% CI [.050, .057], $p = .054$; CFI = 0.99; and SRMR = .017), while also being substantively meaningful. Based on this model, as well as on the results of item analyses, we created three subscales: Perceived Stigma (PS; 5 items); Negative Attitudes Towards Care (NATC; 4 items);

and Self-Management Preference (2 items). Following these analyses, we examined the associations between these subscale scores and past-year professional services use, stratified by the presence/absence of past-year disorders.

Conclusion: Our results are consistent with Adler et al.'s (2015) recent findings in that we identified multiple dimensions underlying attitudes towards mental health care: Traditional perceived stigma items, negative attitudes towards mental health care, and a preference for self-management. The fact that self-management preference emerged as distinct from perceived stigma suggests other factors are driving this preference.

1B05: The Centrality of Protocol Adherence in the Evidence-based Treatment of PTSD

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Introduction: Post Traumatic Stress Disorder (PTSD) is a common diagnosis among service members exposed to combat or other traumatic events. PTSD symptoms include re-experiencing the trauma, avoidance and numbing, and hyper-arousal. Individuals with PTSD often report feeling depressed, hopeless, angry, hostile, anxious, unhappy, and suicidal. PTSD also significantly impacts children and families. Despite the existence of evidence-based interventions (EBIs) for PTSD, a recent Institute of Medicine Report (IOM) indicated that there is little evidence that EBIs are effective for active duty service members. The IOM recommended that process and outcome evaluation studies be undertaken to evaluate the effectiveness of EBIs for the treatment of PTSD among active duty service members.

Methodology: This study used case review methodology to assess the degree to which protocol adherence influenced treatment outcomes among active duty service members treated using Cognitive Processing Therapy or Prolonged Exposure at an outpatient mental health clinic (N = 167). Specifically, patient files were coded using a system that captured the number of clinic encounters per patient and the number and percentage of patient encounters on protocol for an EBI. Changes in patient symptoms, measured via the PTSD Symptom Checklist – Military and the Outcomes Questionnaire – 30, over the course of treatment were analyzed using growth curve modeling.

Results: Results indicated that approximately 74% of clinic encounters adhered to protocol. Clinically meaningful changes in patient symptoms were associated with greater proportion of sessions on protocol, but not with a greater number of sessions overall. Maximum symptom reduction was achieved by the 6th to 8th session when protocol adherence was high. Patient characteristics, including gender, ethnicity, and co-morbidity for other psychiatric disorders were not related to symptom change trajectories over time. The majority of patients (71%) did not complete the entire number of protocol sessions.

Conclusion: This study reaffirms that protocol adherence is significantly related to outcomes when using evidence-based interventions. Thus, efforts should be made to minimize the proportion of off-protocol encounters whenever possible, while maintaining some clinician discretion. Relatedly, the findings from this study suggest that increased treatment duration is not always associat-

ed with improvements in patients' symptoms. This may be particularly relevant for clinics with limited personnel and financial resources, as extra time and money spent on off-protocol treatment may not translate into tangible benefits for patients. At the very least, training for military clinicians delivering EBIs should include some training and supervision focused on protocol adherence and overall implementation quality.

1B06: Results of a Thirty Person Evaluation of a Brief, Non-traumatizing Treatment for PTSD

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The Research and Recognition Project

Introduction: The project represents the first scientific evaluation of the Reconsolidation of Traumatic Memories protocol (RTM) a previously anecdotally supported intervention for PTSD. The intervention was previously reported to produce up to 85% symptom eradication in clients whose symptoms were primarily characterized by nightmares, flashbacks and hypervigilance. Believed to be based on the reconsolidation of long term memories, RTM is unique in its approach to the restructuring of intrusive memories thereby eliminating the symptoms that follow from them.

Methodology: Clients were self-referred and agency-referred Veterans with pre-existing diagnoses of PTSD who had served in conflicts dating from Vietnam to the current Middle-eastern wars. Inclusion criteria included >2 Nightmares per month and >1 flashbacks per week. Thirty subjects were screened and admitted to treatment with 4 drop-outs. Dependent variables included PCL-M scores, clinical observations and mRNA changes as reflected in Blood fraction analysis. Independent variables were the Reconsolidation of Traumatic Memories protocol and changes in gene expression post treatment.

Results: 24 out of 26 clients scored below the national cutoffs for PCL-M (45) at two weeks post and 25 of 26 (96.1%) at six weeks post. 25 of the 26 program completers left treatment free of PTSD symptoms as adjudged by clinical staff and reported by their families and associates. Informal follow-ups at six months found the adjustments had held. The RTM treatment was significantly associated with alterations in cell signaling pathways that have previously been associated with PTSD among both military and civilian samples thereby increasing evidence towards the identification of a reliable biomarker for PTSD.

Conclusion: The RTM Protocol has eliminated symptoms in 96% of program completers and has been associated with significant changes in gene expression associated with PTSD and its elimination. The project has provided evidence that The RTM Protocol is worthy of further investigation. It further confirms ongoing research into the identification of a reliable biomarker for the diagnosis of PTSD and its cure.

1F02: Mindsight: An Online Educational Resource to Promote Awareness and Reduce Sigma Associated with Mental Illness

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Brief Description: Mental illness (MI) is the leading cause of

disability in Canada and a growing public health concern. One in five Canadians will develop a MI in their lifetime and most Canadians know someone who has a MI. Everyday 500,000 Canadians are absent from work due to a mental health challenge. In 2013, 1 in 6 full-time Regular Force members of the Canadian Armed Forces reported symptoms of at least one of the following disorders: major depressive episode, panic disorder, post-traumatic stress disorder, alcohol abuse or dependence and generalized anxiety disorder. Stigma often prevents individuals from seeking help.

Mindsight is an online interactive educational resource to reduce stigma by promoting awareness of MI, and facilitating a greater understanding of basic strategies and resources for supporting individuals experiencing a mental health challenge. Mindsight highlights the signs and symptoms of common MI and also includes: video clips of individuals living with MI, self-help strategies; strategies for helping a friend, colleague, or family member; treatment options; and available community services and supports. Created in collaboration with Dr. Bruce Ballon, a psychiatrist affiliated with the Centre for Addiction and Mental Health (CAMH), Mindsight takes about two hours to complete and can be done in segments. In addition, by answering some multiple choice questions based on the information in this educational resource, individuals may apply for a Certificate of Completion from UOIT's Faculty of Health Sciences. Mindsight can also be customized; the video clips can be changed to represent other individuals who want to share their own personal experiences with mental health challenges.

Clinical Outcomes: More than 3,700 individuals have completed Mindsight since it was created in 2010. Preliminary research findings suggest Mindsight is easy to navigate and effective in increasing both awareness and understanding of mental illness and decreasing stigmatizing attitudes.

Patient Population: The Mindsight certificate population is a very diverse group of individuals from a variety of backgrounds, workplaces, occupations and professions. The law enforcement community is well represented within the group, as are the academic, social service and health care communities.

Conclusion: Mental illness has been described as the last acceptable frontier of discrimination. More needs to be done to raise awareness, correct misconceptions and ensure individuals feel able to seek the mental health support and services they need without the fear of being judged. Online resources, such as Mindsight, offer a unique level of anonymity and are cost effective while providing unprecedented access to information.

1F03: The Moderating Effect of Alexithymia on the Relationship between Pre-military Life Events and Mental Health in CAF Recruits

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Department of National Defence

Introduction: Research has shown that adverse childhood experiences (ACE) or traumatic life events can have an impact on later mental health disorders, such as post-traumatic stress disorder (PTSD) and depression. Emotions and alexithymia, a personality trait that is characterized by an inability to understand, process, and describe emotions (Sifneos, 1973), can also play

a role in the association between ACE and later mental health problems. The aim of the present study was to examine the influence of alexithymia on the relationships of ACE and traumatic life events with PTSD and depressive symptoms among Canadian Armed Forces (CAF) recruits.

Methodology: Participants included 19,094 Regular Force recruits who completed a baseline health survey between 2003 and 2009. Mental health was assessed using the 17-item PTSD-Civilian Version (PCL-C; Weathers et al., 1993) and the 9-item Patient Health Questionnaire Depression Scale (PHQ-9). Alexithymia was assessed using the 20-item Toronto Alexithymia Scale (TAS; Bagby et al., 1994), which is composed of factors related to difficulty interpreting feelings (DIF), difficulty describing feelings (DDF), and externally oriented thinking (EOT). Pre-military trauma was assessed using the 15-item ACE scale (Young et al., 2004), and 50 items from the Negative Life Events Scale (NLE; Hammen et al., 1985).

Results: Preliminary hierarchical linear regressions suggested that increased ACE and traumatic life events were associated with higher levels of depressive and PTSD symptoms, as were the DIF, DDF, and EOT facets of alexithymia. Preliminary moderation results pointed to significant interactive effects of ACE and traumatic life events with DIF and EOT facets of alexithymia in the prediction of later depression and PTSD symptoms.

Conclusion: Levels of mental health difficulties among recruits who had experienced ACE or traumatic life events may therefore vary, depending on their levels of EOT or DIF. Implications for future longitudinal research and policy are discussed.

1F04: Relationship between Lifetime Traumatic Events, Mental Disorders, and Suicidal Behaviours in Canadian Military Personnel

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Introduction: Increasing attention has been focused on suicidal behaviour among military personnel. Military personnel may be exposed to traumatic events while deployed, and this exposure has been associated with both mental disorders and suicidal behaviour. There is also evidence suggesting that mental disorders and suicidal behaviour are related to other types of traumatic events (e.g., sexual assault, child abuse) that occur over the course of a lifetime. However, much of the focus has been on the relationship between deployment-related trauma and post-traumatic stress disorder. Less is known about the association of different specific types of lifetime trauma (e.g., child abuse, interpersonal violence, accidental/unexpected trauma) on a broader range of mental disorders. Further, the pathways through which different types of trauma lead to suicidal behaviours among military personnel remains relatively unexplored in research to date. Therefore, the specific objectives are to: (1) determine the prevalence of exposure to specific types of traumatic events among Canadian military personnel; (2) determine the association of specific types of trauma on mental disorders and suicidal behaviour among Canadian military personnel; and (3) to examine whether different types of trauma have a direct or indirect (via specific men-

tal disorders) effect on suicidal behaviour among Canadian military personnel.

Methodology: Data were from the representative Canadian Forces Mental Health Survey collected in 2013 ($n = 8161$; response rate = 79.8%). All respondents were asked to respond to a comprehensive list of 28 traumatic events that occurred during their lifetime. Lifetime diagnoses of several mental disorders was made based on the World Health Organization version of the Composite International Diagnostic Interview. Suicide behaviours were assessed with items asking whether the respondent had ever seriously thought about, or attempted to, take their own life.

Results: Preliminary results indicated a high prevalence of exposure to traumatic events, with gender differences noted for exposure to specific types of trauma. All types of traumatic events were strongly associated with mental disorders and suicide attempts. We are currently in the process of testing whether associations are moderated by gender and whether the relationship between exposures to specific types of trauma on suicide behaviours is mediated via specific mental disorders.

Conclusion: Information regarding the role of specific types of pre-deployment trauma on the relationship between mental disorders and suicidal behavior among military personnel can be used to develop more targeted prevention and intervention strategies aimed at improving the mental health of Canadian military personnel.

2B02: Sleep Disturbances and Suicidal Ideation in Active CAF Members

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Introduction: This study investigated the association between sleep disturbances and suicidal ideation (SI) in a large representative sample of Canadian Armed Forces personnel ($N = 6,700$) obtained from the 2013 Canadian Forces Mental Health Survey (CFMHS).

Methodology: Sleep disturbance was measured using a single item that assessed whether respondents had trouble going to or staying asleep. Suicidal ideation was measured using an item that assessed whether respondents had seriously thought about taking their own life in the past 12 months. Logistic regression analyses were used to determine the impact of sleep disturbances on suicidal ideation, while controlling for presence or absence of probable posttraumatic stress disorder (PTSD), major depressive disorder (MDD), generalized anxiety disorder (GAD), panic disorder (PD), alcohol abuse or dependence (AUD), and number of probable mental health conditions.

Results: Results revealed that 40.89% of participants reported mild to severe sleep disturbances and 4.26% experienced suicidal ideation in the past year. In our final model, sleep distur-

bances ($OR = 2.37$, $s.e. = 0.435$, $p < .001$), number of probable mental health conditions ($OR = 1.66$, $s.e. = 0.204$, $p < .001$), PTSD ($OR = 1.96$, $s.e. = 0.546$, $p < .05$), and probable MDD ($OR = 3.76$, $s.e. = 0.996$, $p < .001$) each significantly predicted the absence or presence of SI. GAD, PD, and AUD did not reach statistical significance.

Conclusion: Results of this study demonstrated an independent effect of sleep disturbance in predicting SI beyond the influence of psychiatric conditions. Findings highlight the importance of incorporating treatments targeting sleep disturbances alongside those addressing specific psychiatric disorders in order to attenuate suicide risk.

2B04: Patterns and Determinants of Alcohol use Among Canadian Military Personnel

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Department of National Defence

Introduction: Alcohol use can lead to increased risk of morbidity and mortality. In an attempt to prevent and address high-risk alcohol use, the Canadian Armed Forces (CAF) offer mental health-related services and health promotion awareness sessions to CAF members. This study aims to explore subgroups of alcohol users among CAF personnel and verify differences in exposure to health promotion awareness sessions, use of mental health and substance use services, and barriers to mental health service use.

Methodology: Analyses were performed on a sub-sample of alcohol users who were participants in a cross-sectional survey of a stratified random sample of currently-serving CAF Regular Force personnel ($N = 1980$). Alcohol use was measured with the AUDIT, psychological distress with the Kessler-10, depression with the CIDI-SF, and posttraumatic stress disorder with the PC-PTSD. Physical health was determined with the number of injuries and chronic conditions. Demographic and military characteristics included in the analyses were: age, sex, marital status, rank, and element. A latent class analysis adjusted for complex sampling was performed to explore different patterns of alcohol use and related problems among CAF personnel. Correlates of derived subgroups were further explored using multinomial logistic regressions. Subgroups of alcohol users will be further compared based on their self-reported use of mental health-related services, barriers to mental health service use, and exposure to health promotion awareness sessions.

Results: A 4-class solution was considered the best fit for the data. Subgroups were labelled as follows: Class 1 - Infrequent drinkers (27.2%); Class 2 - Moderate drinkers (41.5%); Class 3 - Regular binge drinkers with no related problems (14.8%); and Class 4 - Problem drinkers (16.6%). Significant differences in sex, age, marital status, element, rank, physical health, psychological distress, posttraumatic stress disorder, and depression symptoms were found across these subgroups, with problem drinkers demonstrating the poorest outcomes. Further analyses will explore differences across groups in terms of use of mental health-related services, perceived barriers to use services, and exposure to health promotion awareness sessions. These analyses will be performed in summer-fall 2015.

Conclusion: Findings highlight the heterogeneity of alcohol use-

ers and heavy drinkers and the need for tailored interventions addressing high-risk alcohol use. Results have the potential to inform prevention strategies and screening efforts.

2B05: Effects of PTSD and Age on the Association between Combat and Alcohol Use among Canadian Military Members Deployed in Support of the Mission in Afghanistan

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Introduction: Nearly half of Canadian Armed Forces (CAF) personnel exceed the recommended daily drinking limits. Past research has shown that combat exposure is associated with increased post-deployment drinking, but this relationship is often explained by these variables' associations with posttraumatic stress disorder (PTSD) and the use of alcohol to self-medicate PTSD symptoms. Additionally, many individuals show decreased alcohol consumption in adulthood with the assumption of adult roles and responsibilities. The present study hypothesized that, among CAF personnel recently returned from deployment to Afghanistan, participants with more combat exposure would be more likely to report symptoms of problem drinking, and this association would be mediated by PTSD symptoms. Furthermore, it was hypothesized that this association would be stronger for younger members.

Methodology: The data were collected as part of the Enhanced Post-Deployment Screening (EPDS) program, a compulsory health screening for all CAF members who deployed overseas for at least 60 days, administered 90 to 180 days post-deployment. The sample consisted of 15,832 CAF personnel who had deployed in support of the mission in Afghanistan and who completed the EPDS between 2009 and 2012. A moderated mediation analysis explored whether PTSD symptoms could explain the association between combat exposure and problematic post-deployment alcohol use, and whether this relationship would be amplified in younger members.

Results: Results revealed that greater combat exposure, higher reported PTSD symptomatology, and younger age were significantly related to problematic alcohol use. A test of the indirect effect revealed that increased PTSD symptomatology significantly mediated the positive relationship between combat exposure and alcohol use. Age also significantly moderated the indirect effect, such that the mediating effect of PTSD on the association between combat exposure and hazardous drinking was stronger for younger participants.

Conclusion: These findings indicate that the association between combat exposure and post-deployment problematic alcohol use is largely explained by PTSD symptomatology, in accordance with the hypothesis that alcohol is used to self-medicate the symptoms of PTSD. This relationship is particularly pronounced among younger members, who are more likely to binge drink in general, and as a coping mechanism. In order to prevent the negative health, social, and occupational consequences of hazardous drinking, intervention efforts should target treatment of PTSD symptomatology, particularly among younger personnel.

2D01: Extent and Correlates of Mental Health Problems in CAF Regular Force and Deployed Reserve Force Veterans: The 2013 Life After Service Survey

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Introduction: Prevalence of self-reported diagnosed mental conditions alone cannot sufficiently capture the range of mental health problems that impact functioning and health/rehabilitation service needs in Veteran populations. This study is evaluating a more sophisticated method for capturing the full range of Canadian Armed Forces (CAF) Veterans' mental health status and service needs by combining measures of common brief measures of mental health and well-being used in population surveys of (CAF) Veterans (released personnel).

Methodology: The study is using data from the 2013 Life After Service Survey of Regular and deployed Reserve Force Veterans. A 3-category ordinal variable is being derived from (1) self-reported diagnosed mental health conditions, (2) Kessler's K10 measure of psychological distress and (3) the Primary Care (PC-PTSD) screen for posttraumatic stress disorder (PTSD). The variable will represent no/little, mild/moderate and high degrees of mental health symptoms and is being assessed against brief measures of functioning and service utilization. Ordinal logistic regression is being conducted to identify correlates of mental health symptoms.

Results: Separately, the three brief measures of mental health symptoms capture overlapping segments of the population, which supports combining them. For example of the 23% with self-reported diagnosed mental health conditions, 35% are in the lowest K10 category (likely well). However, of the 13% with self-reported diagnosed PTSD, 11% have no PTSD criteria on the PC-PTSD screen and 27% have criteria suggesting subthreshold PTSD. Unadjusted odds of mental health symptoms are correlated with functional difficulties measured as self-rated mental health, SF-12 MCS, activity restrictions, difficulty in adjustment to civilian life and suicidal ideation. These bivariate associations are being explored in multivariate modelling.

Conclusion: This novel approach has the potential to more accurately estimate the mental health and service needs of CAF Veterans. The findings of this study will be reported at the Forum in November. We anticipate that the derived mental health symptoms variable will paint a more comprehensive picture of the full spectrum of mental health status and service needs in CAF Veterans and prove useful in identifying subgroups more likely to have moderate or high levels of mental health symptoms. The findings will inform evidence-based policy and programming decisions to optimize mental health and well-being in this important Canadian subpopulation.

2D03: Mental Health of CAF Veterans – Review of Population Studies

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Introduction: The mental health of Canadian Armed Forces (CAF) populations emerged as an important concern in the wake of difficult CAF deployments in the 1990s. This is the first comprehensive summary of findings from subsequent surveys of mental health and well-being in CAF Veterans, undertaken to inform mental health service renewals by CAF Health Services and Veterans Affairs Canada (VAC).

Methodology: Epidemiological findings in journal publications and government reports were summarized from four cross sectional national surveys: a survey of Veterans participating in VAC programs in 1999 and three surveys of health and well-being representative of whole populations of Veterans in 2003, 2010 and 2013.

Results: While the majority of Veterans had good mental health, a substantial number had mental health problems impacting functioning, well-being and service utilization. Mental health problem prevalence in recent Veterans was larger than in the Canadian general population, earlier era Veterans and possibly the serving population. There were associations between mental health conditions and difficult adjustment to civilian life, physical health and multiple sociodemographic factors. Mental health problems are key drivers of disability. Comparisons with other studies are complicated by methodological, era and cultural differences.

Conclusion: The survey findings support ongoing multifactorial approaches to optimizing mental health and well-being in CAF Veterans, including strong military-civilian transition support and access to effective mental and physical health services. Studies under way of transitioning members and families in the peri-release period of military-civilian transition and longitudinal studies of mental health in Veterans will address important knowledge gaps.

2F04: The Health Care Team Challenge™: A Bridge to Mutual Benefits for Learners, Educators, Clinicians and Patients

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Brief Description: Health challenges representative of military and Veteran personnel and their families are highlighted for health sciences students through collaboration and competition, leading to greater awareness and understanding in their future practices. The Health Care Team Challenge™ (HCTC™) is a well-recognized, interprofessional (IP) education activity originally developed at the University of British Columbia. Teams of students voluntarily participate in a friendly competition to develop IP care plans for an individual with complex health problems. A judging panel selects the winning team, based on the most realistic, patient-centred plan, with attention to innovative, collaborative approaches. The Office of Interprofessional Education & Practice at Queen's University

has hosted HCTC™ for several years.

Clinical Outcomes: Student volunteers from the university's five healthcare programs, were randomly assigned to three IP teams, each matched with a faculty mentor. Students were oriented to the case and competition guidelines with teams working independently for three weeks to research and plan presentation strategies for the competition event. A winning team is selected with feedback regarding strengths and weaknesses provided to all teams. The winning team represents the university at a national competition.

Patient Population: Clinical teams from the local healthcare community develop cases based on specific patient populations and areas of expertise. Members of the identified care team join patient, faculty and student representatives to form the judging panel. Our most case recent collaboration with the healthcare team at Canadian Forces Base Kingston highlighted mental health challenges. Following the competition, student teams' care strategies were shared with the clinical team to enhance care for their patients.

Conclusion: Student participants report acute awareness of the responsibilities and challenges inherent in providing collaborative care for a real patient within an authentic context. Increased motivation to create realistic, evidence-based interprofessional care plans was noted. Judges and clinical teams report unexpected enjoyment as participants in this process, despite the time required to fully engage in case development and judging duties. This collaboration enhanced the relevancy and depth of understanding of clinical issues for student participants, and forged stronger relationships between the university and clinical community. Case development and judging by CFB Kingston enhanced insight and understanding for students who are educated outside the military context. A university based IPE activity is improved through community partnership with a military base resulting in win-win outcomes for all stakeholders.

3A01: National Time Trends in Suicidal Ideation and Attempts among CAF Personnel and the General Population

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Introduction: We examined: 1) national trends in prevalence of suicidal ideation, plans and attempts in the Canadian general population (CGP) and the Canadian Armed Forces (CAF); 2) help seeking rates among people who reported suicidal behavior; and 3) compared military and civilian populations on these outcomes.

Methodology: Data were drawn from four nationally representative surveys (age 18-60 years old) with the same methodology approximately 10 years apart. The CGP surveys were conducted in 2002 (N=25,643), and 2012 (N=15,981). The CAF surveys were conducted in 2002 (N=5,153), and 2013 (N=6,700). Lifetime suicidal ideation, plans, and attempts, and help seeking related to mental health problems was assessed using the Composite International Diagnostic Interview.

Results: Over the last decade, there was no change in rates of all suicidality outcomes among military and civilian populations with the exception of military men showing a significant increase in lifetime suicide attempts (adjusted odds ratio [AOR] 1.3, and military women showing a significant decrease in lifetime suicide ideation (AOR 0.78). Mental health service use among people with suicidal behavior significantly increased over time across military and civilian populations. CAF members with suicidal behavior had a significantly higher prevalence of all types of help seeking compared with their counterparts in CGP across both time points.

Conclusion: The lack of change in suicidality rates in civilian populations and increasing prevalence of suicide attempts among military men have policy and clinical implications. The greater use of mental health services among military personnel who accessed federally funded clinics in comparison to civilians who accessed provincially funded services are important to consider in suicide prevention policy development.

3A02: Brief Cognitive Behavioral Therapy to Prevent Suicide Attempts in the Military

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Brief Description: Brief cognitive behavioral therapy (BCBT) entails 12 outpatient individual psychotherapy sessions scheduled weekly or biweekly. BCBT is delivered in three phases: phase I focuses on crisis management and emotion regulation skills training, phase II focuses on cognitive reappraisal skills targeting underlying suicidal beliefs, and phase III focuses on relapse prevention.

Clinical Outcomes: The primary outcome is suicide attempts, which are assessed via structured clinical interview. Soldiers were enrolled if they reported active suicide ideation during the past week and/or a suicide attempt during the past month. Soldiers were randomized to either BCBT or treatment as usual (n=76 per arm) and followed for two years. Final results indicate that Soldiers receiving BCBT were 60% less likely to make a suicide attempt during the two-year follow-up as compared to Soldiers receiving treatment as usual (HR=.38, [95% CI: .16, .87], p=.023). Soldiers in BCBT spent significantly fewer days in an inpatient psychiatric facility during the course of the study, and were approximately 50% less likely to be separated from the military for medical reasons. There were no differences between the groups in terms of psychiatric symptom severity, although effect size calculations indicated an advantage for those in BCBT.

Patient Population: Patients included 152 active duty U.S. Army personnel. Participants were predominantly male (85%) and junior enlisted (70%) with a mean age of 27 years. Approximately three-quarters had a history of at least one suicide attempt, and the majority had one or more deployments to Iraq and/or Afghanistan.

Conclusion: BCBT significantly reduces the incidence of suicide attempts as compared to standard mental health care. The effect appears to be specific to suicidal behavior. BCBT could be a cost-effective and efficient component for reducing risk for suicidal behavior among military personnel.

3A03: Group-based Cognitive Processing Therapy for PTSD in Serving Military Members at a Canadian Military Mental Health Centre

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Brief Description: Group-based Cognitive Processing Therapy (CPT) has been shown effective in randomized trials for the treatment of military-related post-traumatic stress disorder (PTSD) in serving members, yet it is not commonly available in Canadian Armed Forces (CAF) mental health settings. Group therapy has many advantages beyond cost-effectiveness. In a military population, where cohesion is strong, group treatment offers social support and the normalization of experiences. Furthermore, it provides the opportunity for members to challenge each other's maladaptive beliefs and behaviours in a way that they tend to find more credible than similar challenges by a civilian clinician. The Gagetown Operational Trauma and Stress Support Centre (OTSSC) has been providing CPT groups since January of 2014. Information about the outcomes, potential pitfalls, and ways to encourage clients and clinicians to use group-based CPT will be provided.

Clinical Outcomes: A mixture of pre/post self-report measures, dropout rates, proportion of clients needing services after the group, informal observations, and client feedback will be provided.

Patient Population: Serving military members with operationally-related PTSD

Conclusion: Group-based CPT is a valuable addition to trauma-focused therapy services. Military members are effective in helping each other gain a new understanding of the traumatic events linked to their PTSD. There are some important recommendations about exclusion criteria, facilitator training, and about promoting the group to prospective clients.

3A04: "Directly Attributable to Military Service": Institutional Attitudes towards Suicide in the Canadian Military, 1915-2015

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Introduction: Suicide among Canadian military personnel and Veterans is a concern that has confronted policymakers and stakeholders for the past 100 years. Building on research into historical public perceptions of soldier suicide, this study will examine how institutional attitudes have informed government, medical and military responses to the issue of suicide in the Canadian Armed Forces. Institutional attitudes are shaped by the prevailing cultural beliefs of specific eras and social contexts. This study will examine selected cases to document the ideas and beliefs that have influenced the process of military suicide investigation during the First World War and the present.

Methodology: This study will use primary and secondary sources to identify institutional attitudes towards suicide among Canadian serving military personnel and Veterans since the First World War. It will analyze board of inquiry investigations as case

studies to assess changes and continuities of Canadian institutional attitudes concerning mental health and suicide between 1915 and 2015. This research will be used to explain how the cultural beliefs of institutions shape the questions boards of inquiry ask, what information counts as evidence and how this evidence is interpreted. Finally, the study suggests the implications this research has for de-stigmatization of suicide.

Results: Preliminary results indicate that investigations into suicide of Canadian military personnel have historically focused on the question of whether the deaths are directly attributable to military service. The decisions of board of inquiry investigations reveal how Canadian institutions have defined military service as well as what criteria has been used to attribute the cause of the deaths. It is hypothesized that efforts to de-stigmatize suicide in Canada's military and veteran population need to recognize how institutional attitudes about the cause and nature of the deaths in turn affect perceptions of soldiers who die by suicide.

Conclusion: This historical analysis of military suicide investigations between 1915 and 2015 attempts to identify the institutional attitudes towards suicide that have historically conflicted with de-stigmatization efforts. De-stigmatization of suicide is a key aspect to reducing its occurrence. The manner in which institutions have determined the attribution of suicides is directly relevant to de-stigmatization because it identifies whether the deaths will be treated as connected to military service. The research will provide stakeholders with a necessary understanding of the crucial role cultural beliefs and institutional attitudes play in how the Canadian government and military confront the issue of suicide in soldier and Veteran populations.

3D01: A Population-based Overview of Health Services Utilization for Mental Health Reasons in a Cohort of Canadian Veterans in Ontario

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Introduction: Mental disorders that occur during active military service may persist or become more apparent at the end of a career. In a national survey of Canadian Veterans, 23% reported having been diagnosed with one or more mental disorders, 5.8% reported suicidal ideation, and 1.1% reported a suicide attempt in the previous year. The majority of existing information about mental health services utilization in Veterans is derived from national surveys using self-report data, is limited to data collection on specialized programs with eligibility restrictions, or is captured in the United States. Our group has recently reported on the development of a resource of longitudinal data to study Canadian Veterans of the CAF and RCMP residing in Ontario. This resource has incredible research potential to augment existing survey data collected by Veterans Affairs Canada (VAC) and the Department of National Defense. In this presentation, we describe mental health services utilization following release from the CAF or RCMP.

Methodology: This is a retrospective cohort study designed to

use provincial healthcare data to study publically funded, mental health services utilization in Canadian Veterans residing in Ontario between 1990 and 2012. Psychiatric hospitalizations and emergency department visits, psychiatrist visits, and mental health-related primary care visits were measured. Databases using International Classification of Disease coding systems (CIHI-DAD, NACRS) included only primary diagnostic codes 290-319. A validated algorithm for capturing mental health in primary care was used. Frequencies, proportions and 95% confidence intervals (CI) are presented for categorical variables. Means, standard deviation (SD), median and interquartile range (IQR) are provided for continuous and count data. Repeated measures of each variable are presented in five year intervals following entry into the cohort, stratified by age at entry into the cohort.

Results: The cohort is comprised of 23,818 CAF and RCMP Veterans who live in Ontario. The average duration of follow-up was 9.33 years. In the first five years following entry into the public healthcare system, 29.0% (28.4-29.5) of Veterans had mental health-related primary care visits, and 6% visited a psychiatrist at least once, with an average of 12 psychiatrist visits for those with at least 1 visit. Almost 8% of Veterans age 30-40 at the time of release saw a psychiatrist in the first five years, compared to only 3.55 of Veterans ≥ 50 and were persistently higher users of psychiatrists. Veterans in the youngest age category at release (<30 years) were the most frequent users of emergency department services for a mental health related reason (5.1% had at least one ED visit). The median length of stay for a mental health related hospital admission was 8 days (IQR 2-27) among Veterans <30 and 29 days (15-48) among Veterans ≥ 50 .

Conclusion: The use of public mental health services by Veterans is different than the general population. Understanding how Veterans use the public healthcare system for mental health problems is an important step to ensuring that healthcare needs are met following a transition to civilian life. By planning appropriate and adequate healthcare services, unnecessary hardship and suffering among Veterans transitioning out of active military service may be prevented.

3D02: Quality of Life of Veterans with Post-traumatic Stress Symptoms

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Introduction: The presence of residual post-traumatic symptoms is the norm rather than the exception among Veterans with past or present post-traumatic stress disorder (PTSD), even during or after an efficacious treatment. Moreover, a decrease in PTSD symptoms does not warrant a direct and equivalent increase in quality of life. There is considerable variability in indices of quality of life among individuals with PTSD, suggesting important individual differences. The objective of this study is to examine the relationship between post-traumatic symptom severity and quality of life among Veterans consulting an operational stress injury (OSI) clinic.

Methodology: Eighty-six (86) veterans consulting an OSI clinic have completed validated self-report questionnaires targeting PTSD symptom severity, quality of life, depression symptoms,

alcohol use, sleep quality and pain severity.

Results: There is a strong negative association between post-traumatic symptoms and quality of life. However, this association is no longer significant when depressive symptoms are accounted for (complete mediation). Pain and sleep also affect this association, but to a lesser extent (partial mediation). Alcohol use showed no significant impact on the relationship between post-traumatic symptoms and quality of life.

Conclusion: Although PTSD symptom severity has an important impact on quality of life, depression, sleep and pain considerably affect this relationship. One way to improve the efficacy of empirically-based treatments for PTSD in military and Veterans populations may be to specifically address these issues in therapy. One important implication is the demonstration that Veterans may aspire to acceptable levels of quality of life and daily functioning despite the presence of persistent post-traumatic symptoms.

3D03: The Moderating Effect of Gender on the Association between Combat Exposures and Post-deployment Mental Health

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Introduction: Research based in the US and the UK has demonstrated that women are at increased risk for post-deployment mood and anxiety disorders. It is unclear if this increased risk is accounted for by the higher risk of these disorders in women overall, or whether women are more vulnerable to deployment-related trauma. This is an important question, given the increasing presence of women in combat roles. The current study explores the role of gender, combat, and their interaction in post-deployment mental health in Canadian Armed Forces (CAF) personnel.

Methodology: A secondary analysis was conducted on data collected for the Enhanced Post-Deployment Screening (EPDS) program, which was created to identify deployment-related health and psychosocial problems. This screening is compulsory for all CAF members returning from international operations lasting more than 60 days, and is administered 90-180 days post-deployment. The current sample consisted of 15,832 CAF personnel who had deployed in support of the mission in Afghanistan and who completed the EPDS between 2009 and 2012. For the present study, mental health was measured using post-traumatic stress disorder (PTSD) checklist (PCL) and the SF-36 Mental Health Component Summary, a measure of general mental health. A moderation analysis was conducted to examine whether combat exposure was differentially associated with mental health outcomes based on participants' sex, while controlling for differences in age and rank category.

Results: Both female gender and increased combat were independently associated with increased PTSD symptom burden and poorer general mental health, while accounting for differences in rank and age. Furthermore, moderation analyses revealed a small but significant interaction effect between gender and combat exposure: while both men's and women's mental health declined with greater combat exposure, the magnitude

of this effect was greater in female respondents relative to their male counterparts.

Conclusion: The results support previously reported links between combat exposure and post-deployment mental health in service personnel. These findings also provide further evidence for the association between gender and post-deployment mental health outcomes. In the current study, female gender was associated with increased PTSD symptom burden and poorer general mental health. Furthermore, the magnitude of this relationship was amplified in those servicewomen reporting greater combat exposure. While the overall effect of the interaction between combat and gender on post-deployment mental health was relatively small, these findings highlight the need for continued research examining the potential risk factors and particular deployment experiences of servicewomen in combat situations.

3D04: Results from a Pilot Study of an Online Chronic Pain Treatment for Military, RCMP and Veterans

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Introduction: Chronic pain is a significant health problem in Canada. Data suggest that between 19 and 29% of the Canadian population suffers from chronic pain. These rates are estimated to be doubled in Canadian military Veteran populations. One of the most prevalent and efficacious psychotherapies used for treating chronic pain has been Cognitive Behavioural Therapy (CBT). Modified forms of CBT, such as Acceptance and Commitment Therapy (ACT) have been designed to address specific health concerns of those dealing with chronic pain. Numerous studies have found ACT and other acceptance-based behavioural therapies (ABBT) to be effective both in treating chronic pain and in maintaining treatment gains. For chronic pain patients, internet-based interventions offer the advantage of allowing patients to engage in treatment on their own time, when they might otherwise miss in-person appointments due to pain flare-ups. The purpose of the study was to gather preliminary evidence regarding the efficacy of an online acceptance-based behavioural treatment for chronic pain designed for military, RCMP, and Veteran populations.

Methodology: Individuals with a military or RCMP background who suffer from chronic pain (N = 15) were recruited through the Winnipeg Operational Stress Injury Clinic. Participants completed an 8-week online treatment for chronic pain that was supplemented with biweekly group check-in sessions. Measures which underscored the key facets of the fear-avoidance model of chronic pain were completed by participants at baseline and immediately following treatment. Analysis of participant data was conducted using multiple paired-samples t-tests.

Results: Results indicated statistically significant improvements from baseline to post-treatment on pain acceptance, kinesiophobia, and pain-related catastrophizing, with medium- to large-effect sizes. Pain intensity trended in the right direction, with a small effect size, but the difference between pre- and post-treatment scores was not significant.

Conclusion: This study provides preliminary evidence for the efficacy of an online acceptance-based behavioural treatment

for chronic pain in military and RCMP populations. Further, it enriches the growing body of literature supporting the effectiveness of online interventions for chronic pain.

3F03: 4-Session Meditation-based Cognitive Behavioural Therapy Psychoeducational Classes for CAF Personnel and Veterans

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Brief Description: It is essential to develop effective and accessible interventions for the treatment of mental health conditions for military personnel and veterans. The 4-Session Meditation-Based Psychoeducational Classes is a new and innovative intervention offered for military personnel and veterans receiving care at the Operational Stress Injury Clinic in Winnipeg, MB. The classes have been implemented as the first line of treatment within a broader stepped-care model. This large group treatment is referred to as “classes” rather than “groups” to alleviate feelings of intimidation and perceived stigmatization experienced by patients. Psychoeducational classes are a cost-effective way of providing patients with the opportunity to learn strategies and skills for managing symptoms of mental illness and gaining improvement in overall functioning. Based on a 2-Session CBT pilot intervention used with a civilian outpatient population, the model has now been adapted into a 4-Session MCBT intervention for both civilian and military populations. Founded upon the principles of Mindfulness and CBT, the psychoeducational classes provide patients with the opportunity to engage in both didactic and experiential learning activities.

Clinical Outcomes: Self-report measures are currently used to monitor the quality of the intervention and examine the success of the service. The main outcome measures include the DSM5 Level 1 Cross-Cutting Scale, the Clinical Global Improvement Scale, and the Session Rating Scale.

From the 2-Session civilian pilot (N=80), preliminary findings indicate over 25% reported self-perceived improvement in overall functioning after attending at least one session. Over 30% viewed the class as useful with the approach and goals of the intervention aligning well with the patients’ perceived needs for services. Based on qualitative feedback including requests for increased guidance with homework activities and an expansion of information relating to psychiatric diagnoses, the 2-session CBT model was modified into the 4-Session MCBT model for use with both civilian and military populations.

Patient Population: The patient population receiving care at the OSI Clinic includes both veterans and members who are currently serving in the Canadian Forces and RCMP.

Conclusion: It is necessary to provide accessible and high-quality outpatient interventions for military personnel and veterans who are living with mental illness. The MCBT psychoeducational classes provide patients with the opportunity to receive educational information and practical strategies within a single session. Further examination of the outcomes of this type of intervention is necessary to better inform both health-care policy makers and mental health professionals working with the military population.

4A01: The Evidence-base of Mental Health Programs

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Introduction: The Clearinghouse for Military Family Readiness (Clearinghouse) at the Pennsylvania State University is an applied research center focusing on the dissemination of the evidence-base for programs utilized to enhance the well-being of children, youth, and families. Over 900 programs have been vetted by the Clearinghouse and placed on the Continuum of Evidence. The Clearinghouse uses a rigorous, systematic process to review and categorize programs. Several factors are considered during the review, including ensuring that the program results in its desired outcome and has a lasting effect on its target population. Many of programs reviewed by the Clearinghouse cover the topics of mental health. Mental health programs are those covering a wide range of topics that include anger, antisocial behavior, anxiety, behavioral problems, depression, emotional competency, grief and loss, life stress, PTSD, stigma, and suicide. Mental health programs are implemented in a wide range of sectors (e.g., communities, schools, faith organizations).

Methodology: Evaluations published in peer-reviewed journals were vetted using five criteria: (1) Significant Effects - rigorous statistical evidence, (2) Sustained Effects, (3) Successful External Replications, (4) Study Design, and (5) Additional Criteria, including representative sample, attrition, practical significance, and adequate outcome measurement. Each evaluation of a program is reviewed using the above criteria and the program, based on the evidence, is placed on the Continuum of Evidence. The program can be placed as either, (1) Effective-RCT, (2) Effective-Quasi, (3) Promising, (4) Unclear Plus (potentially promising features), (5) Unclear with mixed results/no evaluations, (6) Unclear Minus (potentially ineffective features), or (7) Ineffective.

Results: A total of 448 programs related to mental health have been vetted and placed on the Continuum of Evidence by the Clearinghouse. Programs vetted have been implemented within the sectors of Community-Based (N=277), School-Based (N=210), Family-Based (N=66), Medical Settings (N=20), Work Sites (N=22), and Multi-Sectors (N=32). Mental health programs have been placed on the Continuum of Evidence in the categories of Effective-RCT (N=7), Promising (N=104), Unclear Plus (N=117), Unclear Mixed (N=59), Unclear No Evaluations (N=148), Unclear Minus (N=12), and Ineffective (N=1).

Conclusion: Based on the current evidence of mental health programs we will highlight the topic areas where programming strengths exist in order to inform practice and policy. Gaps in mental health programming will be identified to suggest possible areas of research and programming need. In addition, mental health programming utilized for military Service members and their families will be identified.

4A02: Predictors of Mental Health Treatment Discontinuation in Canadian Military Personnel

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son University; ³Veterans Affairs Canada; ⁴Western University; ⁵McMaster University; ⁵Defence Research and Development Canada; ⁶Canadian Forces Health Services Group

Introduction: Previous research estimates that, among community samples, 20-65% of patients will drop out of treatment prematurely (Garfield, 1994; Wierzbicki & Pekarik, 1993; Sparks et al., 2003). Identification of factors associated with premature treatment dropout may help tailor interventions that target barriers to treatment and reduce early treatment discontinuation among military personnel and Veterans. Previous studies have identified predictors of treatment discontinuation, including younger age, minority group status, low income, lack of employment, fewer years of education, and the comorbid mood or substance use disorders (Kessler et al., 2001; Edlund et al., 2002; Wang, 2007; Olsson et al., 2009; etc). In military and Veteran populations there may be additional predictors of early treatment discontinuation. Indeed, it has been suggested that successful delivery of psychotherapy to military personnel and Veterans with mental health concerns may be challenging (Glynn et al., 1999; Foy et al., 1996) due to a variety of factors. Although other factors facilitate delivery of care among currently serving personnel (e.g., access to specialty care for trauma-related disorders, adequate income, health insurance coverage, and lower rates of substance use disorders). It is possible that there are differences in rates of attrition and contributors to treatment discontinuation between military personnel and civilian populations. The proposed analysis will add valuable information about factors associated with treatment discontinuation among Canadian Armed Forces personnel, identifying factors associated with increased and decreased likelihood of treatment discontinuation, and assessing the net effects of factors that hinder and facilitate treatment continuation.

Methodology: Multivariate analyses will be used to evaluate predictors of treatment discontinuation, and examine barriers to treatment and reasons for treatment discontinuation using data from the Canadian Forces Mental Health Survey (2013). The primary covariates of interest include component (e.g., Reserve vs. Regular Forces), age, sex, social support, deployment status, type of treatment received and frequency of treatment sessions. Other covariates to control for include disorder severity and presence of comorbid conditions. Analyses will also be conducted to compare the rates of treatment discontinuation in military personnel and civilians.

Results: Data analyses are pending. It is expected that these analyses will be complete by the time of the Forum.

Conclusion: The findings of the proposed study could be used to inform treatment guidelines, particularly to address barriers to treatment among CF members with mental health conditions; and to increase the rate of treatment engagement while reducing the rate of treatment dropout among these individuals.

4A03: Predictors of PTSD, Depression and Suicidal Ideation among CAF Personnel - A Replication of the 2002 Sample using the 2013 CAF Mental Health Survey

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Introduction: In 2012, the Canadian government under the auspices of Statistics Canada set out to survey a representative sample of civilian and military members about their mental health and well-being. This was a replication and augmentation to the 2002 survey.

Methodology: Data from the 2002 health survey was used to inform a structural equation model that identified unique relationships among trauma history, number of military deployments, major depressive disorder, alcohol misuse, and suicidal ideation.

Results: The objectives of the 2013 Canadian Armed Forces Mental Health Survey were to: 1. determine the extent to which the Canadian Armed Forces' renewed mental health system has influenced the need for mental health services, and 2. determine the effect of the mission in Afghanistan on the need for mental health services among currently serving Regular and Reserve Force personnel. The current study is a replication of the 2002 survey review with an enhanced emphasis on factors of psychological wellness.

Conclusion: By considering the possible role of mediating and moderating variables that co-activate or inhibit adverse mental and physical health outcomes in a nationally representative Canadian military sample and a comparison cohort of the general population, our study aims to refine our understanding of the etiology of post-trauma mental and physical health outcomes post Afghanistan war.

4A04: Altered Brain Rhythm Synchronisation in Soldiers with Combat-related PTSD

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Introduction: Posttraumatic stress disorder (PTSD) is a serious psychiatric condition which often manifests after experiencing a traumatic life event. Whilst its psychological causes and resultant symptomology are well understood, relatively little is known about any potential changes in neurophysiology. In particular, there is a lack of knowledge how changes in functional connectivity may be linked to the disorder.

Methodology: Here, using non-invasive neuroimaging with magnetoencephalography (MEG), we characterised resting-state brain rhythm connectivity, both across the cortex and in putative pre-defined brain networks in soldiers with PTSD ($n = 25$) and a matched group of control soldiers ($n = 25$).

Results: We found that brain synchrony in our PTSD population exhibited hyperconnectivity in the gamma band largely confined to the left temporal and frontal regions when compared to those who underwent comparable combat experience but did not develop PTSD. Furthermore, intrinsic resting-state network connectivity differences were observed in a variety of frequencies, with *decreased* intra-network synchronisation in the PTSD group when compared with controls in the alpha band

(8-14 Hz), as well as *increased* connectivity in the high-frequency gamma range (80-150 Hz) for the default-mode and salience networks ($p < 0.05$). Moreover, we uniquely demonstrate that hippocampal hyperconnectivity in the PTSD group is associated with PTSD symptom severity as well as interactions within the beta frequency band.

Conclusion: Given this, we conclude that these atypical synchronous neural interactions across the brain and within neuronal circuits may underlie some of the psychological symptoms of PTSD, and that the hyperconnectivity in memory-related regions with other nodes in the aberrant network contributed to abnormal brain function underlying the symptoms of PTSD. These findings pave the way for the development of novel diagnostics and the assessment of therapeutic efficacy, as well as contributing to accumulating evidence that PTSD is a disorder of brain systems rather than being confined to individual regions.

4B01: MDMA-facilitated Cognitive-behavioral Conjoint Therapy for PTSD

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Introduction: Currently, there are several psychotherapies that have been deemed front-line treatments for PTSD in multiple treatment guidelines. These treatments yield excellent results for approximately half of participants in treatment outcome studies. However, military service members and veterans have been shown to be less responsive to these evidence-based treatments, leaving room for innovation in treatment efforts to help those who may not respond to them. There are several studies showing the benefits of augmenting psychotherapy for PTSD with \pm 3,4-methylenedioxymethamphetamine (MDMA). In addition, cognitive-behavioral conjoint therapy for PTSD (CBCT; Monson & Fredman, 2012) is a treatment designed to improve PTSD, with the additional benefit of enhancing interpersonal functioning, which is consistently documented to be a factor associated with PTSD and PTSD treatment outcomes. Given the purported effects of MDMA to enhance openness to experience, empathy, and prosocial behavior, we are conducting a Phase 2 trial of MDMA-facilitated CBCT for PTSD.

Methodology: In this uncontrolled trial, 10 intimate and non-intimate dyads will receive a course of CBCT augmented with MDMA for key sessions of the protocol (i.e., communication skills training and initial trauma processing). The remainder of sessions will be delivered via telehealth to increase access to the therapy. The therapy will be delivered over a 1-month period (i.e., massed dosing) to test the efficiency and initial efficacy of this format. The primary outcome variable is clinician-rated PTSD symptoms for the veteran. Secondary outcomes are veteran-rated PTSD symptoms, collateral-rated PTSD symptoms, and interpersonal functioning. Tertiary outcomes include comorbid symptoms (i.e., general anxiety, depression, guilt, anger, communication skills).

Results: Members of the CBCT investigative team have under-

gone the clinician protocol for training in MDMA-facilitated psychotherapy for PTSD, including receiving MDMA, to understand the planned intervention protocol. Considerations in the development of the protocol will be explained and discussed.

Conclusion: Although MDMA-facilitated psychotherapy has been controversial because of its non-prescribed, illicit use, we believe it holds potential to potentiate the effects of psychotherapy, especially in an interpersonal psychotherapy context.

4B02: MDMA-facilitated Psychotherapy for PTSD

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Introduction: Two serotonin reuptake inhibitors (SSRIs) have received FDA indication for treatment of post-traumatic stress disorder (PTSD), however the effectiveness of pharmacotherapy for PTSD is limited. Psychotherapy, including several well established evidence based methods, is the mainstay of PTSD treatment. Despite advances in this area, a significant percentage of PTSD patients are refractory to existing treatments. Recent research has explored the possibility that certain drugs could increase the effectiveness of psychotherapy when administered intermittently in conjunction with psychotherapy sessions. The most robust published results to date using this approach have been in early clinical trials of \pm 3,4-methylenedioxymethamphetamine (MDMA)-assisted psychotherapy. These studies primarily involved civilians with treatment-resistant, crime-related PTSD. A more recent Phase 2 trial, to be completed in late 2015, is showing promising results in a cohort of military veterans, police officers and firefighters, mostly veterans from the wars in Iraq and Afghanistan.

Methodology: In this double blind controlled trial 24 subjects (20 veterans, 3 firefighters and 1 police officer) refractory to prior treatment are randomized to one of three doses of MDMA administered to each individual during two eight-hour psychotherapy sessions one month apart, in conjunction with preparatory and follow-up non-drug sessions of psychotherapy. Outcome measures are repeated one month after the second MDMA-assisted session, and the blind is broken. Subjects who have received the highest dose of MDMA are then eligible to have one additional, open label, MDMA-assisted session. Those who have received low or medium dose are eligible to have three open-label full dose sessions. Outcome measures are again repeated two months following the third MDMA-assisted session. A long-term follow-up occurs one year after the third session. The primary outcome measure is the Clinician Administered PTSD Scale (CAPS). Additional measures include the Beck Depression Inventory-II (BDI-II), Global Assessment of Functioning (GAF), Pittsburgh Sleep Quality Index (PSQI) and Posttraumatic Growth Inventory (PTGI).

Results: In preliminary results both the high dose and the medium dose appear to be more effective than the low-dose in reducing CAPS scores and improving secondary measures: and BDI-II, PSQI, GAF and PTGI. (Final results at primary endpoint, with statistical analysis, will be available by the time of the presentation)

Conclusion: Evidence in phase II trials suggests that MDMA-assisted psychotherapy is effective in treating PTSD in both civilians and veterans who have not responded to established treatments. Phase III trials are necessary to definitively establish safety and efficacy of MDMA-assisted psychotherapy for PTSD.

4B03: The Impact of Mental Disorders on Disability in CAF Personnel

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Introduction: Mental disorders can greatly impact not only individuals and their families, but also employers: Mental health problems can lead to decreased productivity, increased health care costs, and unwanted turnover. However, while a number of studies have examined the prevalence of mental disorders in military organizations, few have assessed the functional impact of such disorders. The goals of this study were: 1) to validate the use of a self-report measure of disability in the Canadian Armed Forces (CAF), and 2) to assess the impact of mental disorders by examining patterns of disability among CAF personnel with and without a past-year mental disorder.

Methodology: Data was obtained from the 2013 Canadian Forces Mental Health Survey (CFMHS). The representative survey sample included 6,696 Regular Force personnel. Disability over the preceding 30 days was measured with the short (12-item) version of the World Health Organization Disability Assessment Schedule—Version 2.0 (WHODAS 2.0). Recommended cutoffs were used to categorize scores into ‘no disability’, as well as ‘mild’, ‘moderate’, and ‘severe’ disability. A diagnostic interview was used to assess past-year mental disorders: major depressive episode, posttraumatic stress disorder, generalized anxiety disorder, and panic disorder. To assess concurrent validity, the WHODAS was compared with the number of two-week disability days, as well as with the Sheehan Disability Scale for individuals with each past-year disorder.

Results: The WHODAS showed good internal consistency and good concurrent validity, correlating significantly with disability days and with disorder-specific disability. Females and older age groups reported more disability. As anticipated, those with past-year mental disorders were much more likely to report moderate or greater disability, compared with those without past-year disorders. Disability was particularly pronounced among individuals with two or more past-year diagnoses.

Conclusion: This study validated a measure of disability in the CAF and showed that mental health problems are significantly associated with disability in this population. Mental disorders should be targeted in programs aimed at disability reduction in the CAF. Future research will examine the relative contribution of mental illness versus physical illness to disability in the CAF.

4D01: Addressing Cynicism, Disillusionment and Embitterment in the Psychological Treatment of Operational Stress Injuries

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Alberta Health Services

Brief Description: Clinical observation finds cynicism, disillusionment, and embitterment prevalent in Veterans being treated for Operational Stress Injuries following deployment or related military service. Although evidence-informed treatments exist for many of the most common OSIs (i.e., Major Depressive Disorder, Posttraumatic Stress Disorder), clinically significant cynicism, disillusionment, and embitterment are not addressed directly in the standard treatments and may interfere with or complicate treatment (e.g., by limiting engagement).

The proposed clinical program defines the constructs of cynicism, disillusionment, and embitterment, hypothesizes relevant contributory experiences (both proximal and distal to military service), and proposes intervention strategies based on relevant clinical and basic research models to help clinicians successfully address the impact of such constructs on treatment and veteran well-being.

Clinical Outcomes: Composite case illustrations of therapeutic interventions addressing cynicism, disillusionment, and embitterment will be used to demonstrate outcomes in terms of in-session change.

Patient Population: Veterans engaging in treatment for Operational Stress Injuries.

Conclusion: Therapeutic strategies addressing cynicism, disillusionment, and embitterment can be an important addition to standard evidence-informed treatments in terms of facilitating engagement in treatment and fostering greater well being in Veterans with Operational Stress Injuries.

4D02: Operational Stress Injury in Paramedic Services: Issues and Organisational Responses across Canada

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Introduction: Operational stress injury is the non-medical term used to describe psychological problems resulting from mentally and/or emotionally traumatic circumstances. Exposure to operational stress may be either in the form of an acute trauma such as that sustained following a critical incident, or it may be in the form of repeated difficult situations that present cumulative stress potentially leading to injury. With relatively frequent exposure to secondary trauma, front line paramedic service employees are exposed to both acute and cumulative operational stress that may elevate their risk of psychological injury.

We sought to describe the promising approaches for addressing cumulative and post-traumatic stress among paramedic services in Canada.

Methodology: A consultative ad-hoc committee met several times by teleconference between December 2013 and June, 2014. The committee reviewed scientific and lay literature, and

described organisational responses to operational stress.

Results: Eight services from seven different provinces are represented in the report. Programs and services showing positive results were demarcated into four main branches of organisational response: coordination, intervention, prevention and treatment. The first three types of response are examined in detail through the types of actions current in best practices and through the available evidence.

Conclusion: Paramedic organisations at the forefront of operational stress response are using comprehensive strategies that target both the individual at risk of injury and organizational relations. The most promising approaches to operational stress appear to be those using multi-faceted approaches that include coordination, intervention, prevention and treatment for operational stress and injury.

4D03: The Effect of Yoga on the Symptoms of Operational Stress Injuries

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Introduction: Many Veterans who have experienced traumatic operational experiences suffer from post-traumatic stress disorder (PTSD) and the anxiety, depression, sleep disturbances, anger issues, associated with it. There have been several studies in the United States using yoga as a "patient centered activity" to relieve Veterans of their symptoms of PTSD. The current study is examining the effectiveness of yoga on psychological problems, specifically depression, sleep disturbances, anxiety, anger problems, pain and quality of life, experienced by Canadian Armed Forces (CAF) serving members.

Methodology: The participants in this study are CAF serving members who were recruited physician and therapist offices, through newspaper advertisements, internet announcements on websites and by word-of-mouth. Participants were given a consent form, demographic information sheet, exercise readiness questionnaire (PAR-Q) and a baseline questionnaire. Baseline questionnaire included PTSD screening, Beck Depression Index, Post Traumatic Checklist for Military (PCL-M), Combat Exposure Scale, Quality of Life (SF-12), Pittsburg Sleep Scale, Anxiety Sensitivity Index-3, Traumatic life Events Questionnaire, State-Trait Anger Scale (STAXI) and McGill Pain Questionnaire.

Yoga classes were offered at two sites in Kingston and one site in Trenton, once a week for twelve weeks. Following the completion of the classes, participants completed a post-yoga questionnaire, as well as a three month follow up and six month follow up questionnaire. All of the follow up questionnaires consists of Beck Depression Index, State-Trait Anger Scale (STAXI), Anxiety Sensitivity Index-3, McGill Pain Questionnaire, Pittsburg Sleep Scale and Quality of Life (SF-12).

Results: The study is ongoing and follow-up data collection will take place until October 2015. A total of 56 participants have been enrolled. Analysis of baseline data collected revealed 38 participants met the criteria for PTSD, 37 met criteria for moderate to severe clinical depression, and 26 met criteria for an anxiety disorder. Preliminary analysis of post yoga data showed

a significant decrease ($p < 0.05$) in severe depression, anxiety, anger, sleep, and pain scores between baseline and post yoga data. Even greater differences were found between individuals with PTSD and those without.

Conclusion: Yoga may be a helpful activity for individuals with operational stress injuries. Final results will be presented at Forum 2015.

4D04: Understanding Paraprofessional Support in the Veterans Transition Network: What Helped and Hindered

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Introduction: The Veterans Transition Network (VTN) offers group programming that focuses on trauma repair for military Veterans with OSI. Initial research has suggested it has beneficial outcomes for participants. Some graduates of the VTN group program are trained as paraprofessionals and their involvement is considered integral to the success of the VTN. Paraprofessional support is a widely used intervention with military populations, although the mechanisms underlying its effectiveness are not fully understood.

Methodology: This study used the Enhanced Critical Incident Technique (ECIT) method to understand how participants in the VTN experienced paraprofessional support. Eight graduates of the VTN were interviewed using a protocol that elicited helpful and hindering aspects of the paraprofessional role. They were also asked to suggest resources or processes (i.e. wish list items) that they might have liked to see in regards to the role of the paraprofessionals. Data analysis resulted in 19 categories, comprised of 182 helpful incidents, 37 hindering incidents, and 18 wish list items.

Results: Helping categories highlighted the importance of shared experience and the role the paraprofessionals played in quickly building trust. They also helped to bridge the differences between clinicians and the group members. The paraprofessionals were integral to the group process in that they set norms for group behaviour, modelled the therapeutic processes by going first in group activities, and assisted with logistical tasks needed to run the program. Hindering aspects of the paraprofessional role included: the perception that paraprofessionals were torn between the clinicians and the group members, issues of rank, lack of training, excessive vulnerability displayed by paraprofessionals, and perceived social distance between paraprofessionals and group members. Wish list items included training initiatives, matching paraprofessionals with group members based on common factors such as age and military experience, more social time with paraprofessionals, and comprehensive follow-up. The findings are congruent with the literature on military paraprofessional support and shed light on additional mechanisms that are the result of the unique nature of the VTN group program.

Conclusion: Paraprofessional support is integral to engaging military populations in therapeutic interventions. Several training recommendations are made which include aligning VTN paraprofessional support with other military peer support initiatives, and providing additional training which emphasizes critical competencies for military paraprofessionals. Future re-

search may explore the therapeutic value of combining para-professional and clinical roles in group therapy for military populations.

4F02: Impact of a Housing First Intervention on Homeless Veterans with Mental Illness: A Canadian Multisite Randomized Control Trial

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Introduction: A large proportion of homeless Veterans live with severe mental health problems. We examine the impact of a *Housing First* program that included recovery-oriented initiatives (Assertive Community Treatment or Intensive Case Management) among those homeless Veterans who participated in a multi-site demonstration project on homelessness and mental health. More precisely, we examine the effect of a *Housing First* approach to care on housing stability, social functioning, and quality of life for homeless Veterans with mental health problems.

Methodology: The data comes from a Canadian multisite randomized trial (ISRCTN42520374), *At Home/Chez Soi*, with a volunteer sample of 2,285 homeless or precariously housed individuals living with mental health problems. Of this sample, 98 individuals reported being Veterans, 57 of which were randomized to intervention and 41 to the control group. The data comes from self-reported measures administered at baseline and after 6, 12, 18 and 24 months, from Fall 2009 to Spring 2013. Data were analyzed by fitting a mixed model for each outcome variable and special attention was given to the event x treatment x Veteran status interaction term.

Results: The *Housing First* approach was effective in improving housing stability, social functioning, and quality of life in homeless Veterans with mental health problems. This is consistent with the effectiveness of this intervention for other homeless Canadians with mental health problems.

Conclusion: These results are consistent with those of previous American studies and suggest that a *Housing First* approach that includes recovery-oriented support would effectively contribute to reducing homelessness in the Canadian Veteran population.

4F03: Dis-location: Home, Belonging and (Virtual) Identity at War in the 21st Century

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Introduction: At Forum 2014, I outlined my qualitative research project exploring how soldiers recreated temporary, virtual "homes" during the Canadian mission in Kandahar, partly in response to evolutionary pressures to need to feel "located" in time and space even in temporary, austere environs. Also, I posited that Canadian Armed Forces (CAF) attempts to institutionalize its own sense of home are antiquated and inadequately account for modern information and communicative technolo-

gies (ICT) that define the current generation of soldiers and blur boundaries between the real and imagined senses of home that ICT creates.

Methodology: For Forum 2015, I will discuss results from 20-40 qualitative interviews with Kandahar Veterans having served in an array of home spaces (interviews are ongoing 2015-16 with a target of ~100). I employ NVivo for narrative, thematic, symbolic, and metaphoric pattern detection.

Results: Ten interviews to date reveal three key themes:

1. ICT use was widespread and contributed to a sense of dis-location, begging questions about the role of the CAF in managing ICT: and about challenges to its own attempts to act as a surrogate home for soldiers.
2. In addition to diverse attempts to manage the physical spaces they occupied as "home" in Kandahar, many turned to symbolic and storytelling strategies to feel at home: whether carrying unauthorized totems, talismans, and emblems on kit or by gaming, playing music, engaging in Afghan rituals, or gossiping.
3. Accounts about animals were ubiquitous. The lengths to which soldiers went to interact with and even adopt animals suggests a strong impulse for a sense of "continuity of home." That Canadians spent over \$8 billion on pets last year suggests they provide an outlet for empathetic expression, which to the deployed soldier may be helpful: or, from an operational perspective, harmful. Animal-related empathy might impede a soldier's ability to inflict violence on another human being.

Conclusions: An established corpus of sociological, anthropological, and literary research captures the challenges to identity and a sense of home for 21st-C Western citizens. However, little has been written based on first-hand accounts from those having lived a variety of "home spaces" in a sustained combat environment. The modern "connected" soldier may prove an important symbol of an evolutionary maladaptation insofar as he or she marks an irreconcilable rift between pre-modern (and indeed pre-historical) notions of home and belonging and the exponential pace of change characteristic of postmodern culture that is now destabilizing the concept of home: perhaps permanently.

5A04: Couples Overcoming PTSD Every Day or the "COPE" Program

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Brief Description: The COPE Program or "Couples Overcoming PTSD Everyday" is an innovative Canadian program for Veterans and their spouses. COPE is a two-phase program providing a five-day residential retreat for five Veterans with post-traumatic stress disorder (PTSD) and their spouses facilitated by two Therapists specializing in the treatment of psychological trauma, couples counselling and group therapy. Phase One of COPE combines psychoeducation, structured reflection and group process to assist couples in increasing their knowledge,

awareness, and understanding of how PTSD has affected their relationship. Together, each couple sets joint goals to improve their ability to manage and cope with PTSD in their lives. The group approach to couples counselling builds a sense of community to combat the inherent isolation that permeates the lives of couples living with PTSD. Phase Two of COPE includes six months of follow-up coaching with professionals trained to assist COPE participants with actualizing and following through on the goals the couples set for themselves during Phase One.

Clinical Outcomes: The COPE Program is currently gathering data for the purposes of formative program evaluation. Baseline data has been gathered prior to Phase One, then twice during both Phases One and Two of the COPE program. The long-term research question guiding the program evaluation phase is: "Does the COPE Program lead to increased knowledge, understanding, awareness and coping skills for couples living with PTSD?"

Patient Population: The COPE Program is targeted towards Veterans of the Canadian Armed Forces (CAF) and the Royal Canadian Mounted Police (RCMP) as well as their partners/spouses. The Canadian Institute for Military and Veteran Health Research (CIMVHR) delegates who may be interested in this will include Veterans, their spouses, Military Family Resource Centre (MFRC) staff, counsellors and therapists and key decision-makers within the CAF.

Conclusions: The COPE Program is a new and innovative program unique to Canada and has been developed by LCol (Ret'd) Chris Linford, his wife Kathryn, and a team of psychologists and counsellors including Dr. Tim Black, Dr. Mike Dadson and Dr. Paul Whitehead. It is the first of its kind to address the issues of PTSD and the couple and is laying the foundation for a clearer understanding of how to help not just Veterans suffering from PTSD, but also their families. The current data is preliminary and will form the basis for larger scale evaluations of effectiveness in the future.

5B02: Potential Effectiveness of Psychiatric Service Dogs used by Veterans with PTSD in Canada: Results of a Consultation with Stakeholders

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Introduction: There is no scientific evidence related to the effectiveness of psychiatric service dogs (PSD) used by Veterans with post-traumatic stress disorder (PTSD). There is also no recognized guideline recommending the specific attributes of psychiatric service dogs. This may explain why psychiatric service dogs are currently not acknowledged as a treatment alternative for Veterans with PTSD in Canada. Moreover, healthcare professionals, including psychiatrists, are also hesitant to recommend psychiatric service dogs given the present context. The objectives of this project was to consult different stakeholders across Canada to document: (a) Disadvantages, difficulties and

concerns to have a service dog, (b) Changes that can usually be observed about the Veteran and members of his family, (c) Tasks for which the dog should be trained to help the Veteran, (d) Promotion and standardisation of service dogs, (e) Evaluation of the relevance and needs for the Veteran before given a dog, (f) Difficulties regarding the evaluation process, dog allocation and follow-up of the dog/abandonment of the dog, and suggestions for future research orientations.

Methodology: A bilingual telephone questionnaire was developed by the research team. Nine questions were asked to stakeholders and four additional questions were asked only to dog school trainers. A research professional contacted 20 people from the list of stakeholders provided by Veterans Affairs Canada and one external psychiatrist interested by the questionnaire in February 2015. Interviews were audio-recorded with the permission of stakeholders. Recorded discussions were synthesized for each question. A model was created to classify the results of the consultation as well as the theory related to diagnosis and treatment for PTSD.

Results: Overall, the consultation highlighted that service dogs are helpful for Veterans with PTSD, particularly in three major domains: detection and intervention when the Veteran is anxious, contributing to a feeling of safety, and sense of relaxation. This was classified under "Roles/tasks of PSD" in the model. Other issues related to use of service dogs in treating PTSD were mentioned and organized under four points: "co-factors" affecting the accessibility and the efficacy of the intervention with service dogs (12 factors), potential "organizational impacts" of the service dog (on 3 types of organizations), "undesirable events" that can occur with the service dog (2 major events), and "efficacy of service dogs" (9 effects).

Conclusion: These results provide a solid rationale to prepare an innovative study aiming to assess effects over time of acquiring a psychiatric service dog on PTSD-related symptoms, daily/social functioning and quality of life of Veterans.

5B03: Exploring the Experiences of Living with Psychiatric Service Dogs for Veterans with PTSD

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Introduction: This study aimed to identify common themes in order to gain an understanding of the positive and negative experiences of Veterans in North America who have been diagnosed with post-traumatic stress disorder (PTSD) and have been using a psychiatric service dog (PSD) as a part of their treatment. As there has been a paucity of research on the topic of PSD, the identified themes highlight important areas within this subject and are useful to take into consideration for future research purposes.

Methodology: Six participants (5 male and 1 female), all of which were Veterans of military service in the United States and had been diagnosed with PTSD, undertook a 30- to 60-minute telephone interview in which they responded to a series of open-ended questions and discussed topics such as obtaining the PSD, the training they received, and the effect the PSD has had on their PTSD symptoms. Using Thematic Analysis, the re-

searcher identified themes and subthemes throughout the 6 interviews.

Results: The researcher identified 5 themes and 12 subthemes. The main themes identified include (a) symptom reduction, (b) increased connection to others, (c) training experiences, (d) negative aspects of owning the PSD, and (e) hope for more recognition of PSDs. The results of this study show that participants reported a meaningful decrease in symptoms and medication use and an increase in positive behaviours after obtaining and utilizing a PSD. The results support anecdotal evidence of the helpful nature of PSDs for Veterans with PTSD. They also report a lack of awareness in the greater public of a PSD's role and an expressed wish for more recognition outside of their own community.

Conclusion: These themes have implications for helping both mental health professionals and dog training professionals. Mental health professionals who are considering recommending PSDs to their clients can use these themes to help identify appropriate candidates. Others who are looking to conduct further research within this field can build upon the themes identified. There are also implications for dog training professionals who are considering creating a training program for Veterans with PTSD.

5B04: Can Praxis: A Model of Therapeutic Learning for Veteran Couples Impacted by PTSD

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Introduction: The impact of post-traumatic stress disorder (PTSD) on family relationships was the impetus for the founders of Can Praxis to develop a unique and innovative Equine Assisted Learning (EAL) program integrated with self-mediation techniques to help Veteran couples with the recovery process. The Can Praxis program addresses a gap in the limited inventory of appropriate and complementary treatment services available to Veterans and their spouses/partners suffering from the associated effects of PTSD, particularly serious relationship issues.

Methodology: Between March, 2013 and January, 2015, 84 Veteran couples have completed the program along with two father/daughter pairings and five RCMP couples. A scientific implementation process is being followed towards validating the following two self-report instruments: i) the 35-item **Horses Relieving Operational Stress Through Experiential Relationships (HOLSTER)** Scale; and ii) the 34-item **Benefitting from Experiential Learning Together (BELT)** Scale. Both instruments include items in the following two dimensions: i) the acquisition of interpersonal skills and knowledge toward using a self-mediation process; and ii) the perceived relief from PTSD symptoms during the EAL session. In addition to obtaining end-of-session data from these 91 pairs, to-date 15 Veteran couples have responded to follow-up surveys intended to examine longer-term outcomes.

Results: Preliminary findings show that 97.80% of Veterans had a positive emotional experience during the program and 93.38% of spouses/partners were in agreement about the Veterans' positive experience and that they were engaged in the experiential learning process. In addition, 90.20% of Veterans

reported that the self-mediation skills and knowledge taught would help them repair their personal relationships. Similarly, 98.39% of the spouses/partners reported that the self-mediation training would lead to a better personal relationship. Based on the follow-up data, 93.33% of Veterans felt that what they took away from the PTSD-tailored EAL program had led to improved family relationships. Similarly, 86.67% of spouses/partners also felt that what they and their Veteran partner took away from the program had improved their personal relationships.

Conclusion: The early results suggest support for the Can Praxis program as an effective and complementary treatment for Veterans struggling with the associated features of PTSD, especially serious relationship issues. The critical, however, still preliminary follow-up findings suggest that better communication, negotiation, and problem-solving skills, attributable to the PTSD-tailored EAL program, are demonstrating long-term positive results for Veteran couples' relationships. However, considerably more pilot testing is required to obtain acceptable sample sizes for end-of-session and follow-up data to meet the validation requirements of the scientific community.

5C02: Impact des relocalisations sur l'adaptation des adolescents issus de familles militaires canadiennes

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Introduction: La littérature concernant le mode de vie militaire démontre que l'un des stressors majeurs pour les familles est la mobilité géographique. Les familles militaires canadiennes ne font pas exception, considérant qu'elles doivent elles aussi composer avec des déménagements fréquents. La présente étude tente donc de mieux comprendre les effets des relocalisations sur l'adaptation des adolescents provenant de ces familles.

Méthodologie: Parrainée par la Direction des services aux familles militaires, et approuvée par l'éthique militaire, (DGMPPRA) et académique (UQAC), l'étude a rejoint 134 parents d'adolescents de familles militaires canadiennes. Par l'intermédiaire de la Chaîne de commandement et des Centres de ressources pour les familles militaires, les participants ont été dirigés vers une plate-forme de sondage en ligne où divers questionnaires étaient disponibles, dans les deux langues officielles.

Sur la base des recherches antérieures, les hypothèses suivantes ont été formulées:

1. Un taux de mobilité élevé sera négativement corrélé avec le rendement académique;
2. Un taux de mobilité élevé sera positivement corrélé avec:
 - une suspension ou une expulsion du milieu scolaire;
 - un diagnostic de trouble de santé mentale;
 - une prise de médication pour un trouble de santé mentale;
 - une rencontre avec un professionnel de la santé pour un trouble de santé mentale;
 - plus de problèmes externalisés ou internalisés;
 - moins de comportements prosociaux
3. Les effets relatifs à un taux de mobilité élevé seront tem-

poraires, c'est-à-dire deviendront non-significatifs après 12 mois de résidence dans la même communauté;

4. L'augmentation du stress chez le parent donneur de soins sera associée à plus de problèmes d'adaptation chez l'adolescent.
5. Des analyses corrélationnelles ont été utilisées pour examiner la présence de relations significatives entre le taux de mobilité et les indicateurs d'adaptation, puis des modèles mixtes ont permis d'examiner quels facteurs influençaient davantage l'adaptation des jeunes.

Résultats: Les analyses effectuées révèlent que les relocalisations fréquentes ne sont pas associées au rendement académique des adolescents et n'amènent pas davantage de suspensions/expulsions du milieu scolaire. Par contre, un taux de mobilité élevé est associé à la possibilité de recevoir un diagnostic de santé mentale, de consulter un professionnel pour cette raison ou encore de prendre une médication psychotrope. De même, le taux de mobilité est corrélé avec la présence de problèmes externalisés, ainsi qu'avec une diminution des comportements prosociaux. Toutefois, ces difficultés s'atténuent significativement après 12 mois de résidence au même endroit. Finalement, la variable la plus reliée avec les problèmes internalisés et externalisés chez le jeune, de même qu'avec un moins grand nombre de comportements prosociaux, est le stress ressenti par le parent.

Conclusion: Les données obtenues indiquent que le meilleur prédicteur de l'adaptation de l'adolescent au déménagement est le stress vécu par le parent, puisque cela implique pour lui de rebâtir ses repères et ceux de sa famille. Afin de minimiser les impacts des relocalisations, la gamme de services déjà en place pour aider les familles militaires aurait tout intérêt à être maintenue, car elle répond aux besoins différents de chaque individu. Par ailleurs, il serait intéressant que des recherches ultérieures définissent plus spécifiquement les sources de stress du parent et ce, afin de mieux l'outiller pour y faire face.

Poster Presentations

P101: Resting State Intrinsic Connectivity Networks in Individuals with Combat Related PTSD: Relation to Neuropsychological Functioning

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Introduction: In addition to its core affective components, Posttraumatic Stress Disorder (PTSD) – including combat-related PTSD – has recently been characterized by a profile of cognitive dysfunction covering a number of domains including long-term memory, short-term memory, attention, and executive functioning. The neurobiological mechanisms underlying such cognitive dysfunctions remain poorly understood. Alterations in intrinsic connectivity networks (ICNs) (characterized by brain regions (nodes) that are functionally and temporally connected), represents one potential mechanism by which alterations in cognitive functioning may occur. Three main ICNs have been

identified in relation to psychopathology: the default mode network (DMN, self-referential thinking), the central executive network (CEN, working memory and executive functions), and the salience network (SN, detection of salient internal or external events and moderation of switching between the DMN and CEN). The relationship between functional connectivity within and between these networks and cognitive functioning in PTSD has not yet been examined.

Methodology: Here, we used resting-state functional MRI data in a sample of combat-trauma exposed males with subthreshold (Clinician administered PTSD scale (CAPS) score > 15) ($n = 7$) or full PTSD (CAPS score > 50) ($n = 14$), in order to determine whether functional connectivity within or between the CEN, DMN, and SN varied as a function of scores on the Repeatable Battery for the Assessment Neuropsychological Status (RBANS).

Results: Reduced connectivity between the anterior insula (a main node of the SN) and the CEN was associated with lower scores on the RBANS immediate memory subscale, and reduced connectivity between the anterior insula and the DMN was associated with lower RBANS attention and total scores (all $p < .005$, unc). Increased connectivity between the CEN and the medial prefrontal cortex (mPFC, a main node of the DMN) was associated with lower RBANS immediate memory, language, attention, and total scores, and decreased connectivity of the mPFC and the SN was associated with lower visuospatial, attention, delayed memory, and total RBANS scores (all $p < .005$, unc).

Conclusion: Our results indicate that cognitive dysfunction in PTSD may be partially explained by alterations in functional connectivity between three core ICNs: the CEN, DMN, and SN. More specifically, altered connectivity of the DMN and CEN with the SN may represent a reduced ability to switch between active cognitive states and rest, while an increase in connectivity between the CEN and the mPFC may represent an inappropriate recruitment of brain regions associated with a brain network active at rest (DMN) to a network involved in active cognitive states (CEN).

P102: Attitudes towards Mental Health Service Use During Basic Military Qualification: Disentangling the Effects of Mental Health Education (Road to Mental Readiness) and the Larger Training Context

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Introduction: The majority of individuals with mental health problems fail to use mental health services. The leading barriers to mental health service use (MHSU) are attitudinal. Military organizations have been implementing mental health education interventions to shift MHSU attitudes. In the Canadian Armed Forces (CAF), the largest mental health education initiative to date is Road to Mental Readiness (R2MR). This study explores the effects of R2MR on MHSU attitudes during Basic Military Qualification (BMQ).

Methodology: Six Non-Commissioned Member (NCM) recruit platoons were included in the study. The study tested two different methods of attitude change: an in-person Powerpoint slide presentation by a former military member to addresses

attitudinal concerns (i.e., slide) and a video with military leaders and current and former military members to address the same attitudinal concerns (i.e., video). Two platoons were assigned to each of these conditions. The remaining two platoons served as the control group (i.e., no R2MR). We used the CAF-MHSU Questionnaire specifically developed for CAF recruits to measure MHSU attitudes/intentions a day before R2MR (Time 1) and approximately a month later (Time 2). We used multivariable mixed linear models to analyze the data to take into consideration clustering within platoons.

Results: We created 6 subscores for MHSU: Instrumental Attitude, Affective Attitude, Subjective Norms, Self-Efficacy, Control, and Intention. Intention and Subjective Norm decreased significantly from Time 1 to Time 2; Self-Efficacy increased significantly. Multivariable mixed linear models revealed that slide presentation led to significantly better MHSU scores than the other two conditions. Recruits in slide presentation group showed significantly smaller decrease from Time 1 to Time 2 in Subjective Norms than recruits in the other two groups. Recruits in the slide presentation group had a small increase from Time 1 to Time 2, whereas recruits in video and control groups had decreased Intention scores. A similar pattern of results emerged for all the other subscale scores (slide better than video and control) although the differences were not statistically significant. Video presentation did not differ significantly compared to the control condition.

Conclusion: These results suggest that the BMQ training itself may lead to changes in MHSU attitudes and intentions, making them more negative and that mental health education interventions such as R2MR can counteract the worsening of attitudes and intentions. Results also suggest that commonly used methods of attitude change (e.g., videos with personal stories) must be empirically tested for efficacy.

P103: Perceived Need, Help-seeking and Barriers to Mental Health Treatment among Adults who Experienced Child Abuse in a Canadian Military Population

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University of Manitoba

Introduction: Child abuse is associated with poor mental health outcomes in adulthood including increased rates of mental disorders and suicide ideation and attempts. However, the effect of child abuse on perceived need, help-seeking and barriers to mental health treatment is largely unknown in the Canadian general population and in the Canadian military population. The objectives of this study were to 1) compare the association between child abuse history and perceived need for mental health treatment among the general population and the military population; 2) compare the association between child abuse history and help-seeking for mental health problems among the general population and the military population; and 3) compare the association between child abuse history and barriers to mental health treatment among the general population and the military population.

Methodology: General population data were drawn from the 2012 Canadian Community Health Survey- Mental Health

(CCHS-MH), a nationally representative sample of 18 to 60 year olds ($n = 15,981$; response rate = 68.9%). Military population data were drawn from the 2013 Canadian Forces Mental Health Survey (CFMHS) which includes a representative sample of the Regular Force personnel as well as a sample of Reserve Force personnel who were deployed in support of the mission in Afghanistan ($n = 8,161$; response rate = 79.8%).

Results: Experiencing any type of child abuse was associated with increased odds of perceiving a need for mental health treatment (adjusted odds ratios ranged from 1.2 to 1.7) and seeking professional help for a mental health problem (adjusted odds ratios ranged from 1.1 to 1.6) in the Canadian general population. Respondents with a child abuse history were more likely to experience barriers to mental health treatment. Attitudinal barriers to mental health treatment were more related to a history of child abuse than structural barriers. Our group is in the process of replicating these results in the Canadian military population.

Conclusion: Among the Canadian general population, experiencing child abuse increased perceived need and help-seeking for mental health problems independent of the presence of mental disorders. It is expected that these associations will also hold true in the Canadian military population. This study can provide insight into how child abuse can impact the health care system in both general population and military personnel and provide evidence for developing intervention strategies aimed at preventing child abuse.

P104: Moderating Effect of Marital Status on the Association between Combat Exposure and Post-deployment Mental Health in CAF Members

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Introduction: Marriage is, generally, associated with better mental health. During times of stress, it may protect against the negative mental health impacts of stressors by promoting engagement in healthier behaviours, enabling greater financial stability, and providing spousal social support. Because return from military deployment may represent a particularly stressful time, the present study investigated the relationship between marital status and well-being among Canadian Armed Forces (CAF) members recently deployed in support of the mission in Afghanistan. It was hypothesized that married personnel would have better post-deployment mental health, and that the positive effects of marriage would attenuate the relationship of combat and mental health problems in married personnel as opposed to unmarried personnel.

Methodology: The data were collected between 90 and 180 days post-deployment as part of the Enhanced Post-Deployment Screening (EPDS) process – a compulsory health screening for all CAF members who were deployed overseas for 60 days or longer – to identify CAF members with deployment-related health difficulties. The sample consisted of 15,832 CAF members who had deployed in support of the mission in Afghanistan and who completed the EPDS questionnaire between January 2009 and July 2012. Three mental health outcomes, general mental

health, posttraumatic stress disorder (PTSD), and major depression, were assessed.

Results: Married/common-law personnel reported greater availability of social support. Greater combat exposure was associated with poorer post-deployment mental health, while marital status had no main effect on mental health. Marital status moderated (albeit minimally) the relationship between combat exposure and mental health, but not in the manner expected: at low levels of combat exposure, married participants reported better mental health than their unmarried counterparts, but at higher combat exposure levels, unmarried participants reported similar general mental health and less PTSD and depression symptomatology than married members.

Conclusion: These findings do not provide support for a protective effect of marital status. Indeed, results point to a “reverse buffering effect” of marriage. Possible explanations include strained relationships and communication, which could exacerbate stress reactions, particularly if relationship quality is low. Findings stand in contrast to other research on the stress buffering effects of workplace social support, suggesting that the protective effects of social support may be contingent on “matching” between the source of social support and type of stressor. Opportunities to leverage the beneficial effects of social support on post-deployment mental health might involve efforts to improve the quality of marital social support or to facilitate workplace social support.

P105: Understanding the Critical Role and Needs of Military-connected Caregivers

Wilcox, S.L., PhD

Blue Star Families (Jessup, MD)

Introduction: Military families have unique needs that are further complicated by unpredictable consequences of military service. There are an estimated 275,000 to over one million Americans who are caring or have cared for Iraq and Afghanistan veterans. The overwhelming majority of military-connected caregivers (MCCs) are women and most of whom are caring for their veteran husband. MCCs perform numerous roles and their care helps to promote faster recovery for wounded warriors and helps save millions of dollars in health care costs. Much of the cost savings, however, are absorbed by the caregivers’ social, legal, and economic costs, as well as costs associated with the health problems that they report from being a caregiver. This study aimed to evaluate the needs of MCC military spouses compared to non-MCC military spouses to guide future research initiatives to help this underserved population.

Methodology: This research is part of a larger United States-based annual survey (i.e., Blue Star Families Annual Military Family Lifestyle Survey) examining the current needs and priorities of military families, service members, and veterans. Non-random convenience sampling was conducted at a national level. Recruitment took place between March-May 2014 using targeted emails and social media to military-connected organizations and institutions. A total of 6,270 individuals started to the assessment of which 3,328 completed the assessment, yielding a completion rate of 53%. Data analyses were conducted with SPSS version 22. Descriptive statistics were reported for all study variables. Chi-square tests were conducted to evaluate statisti-

cally significant associations.

Results: Nearly 70% of MCCs who provided care to a veteran did not receive formal caregiver training. In the past year, MCCs were more likely than non-MCCs to have severe depression ($\chi^2=67.98$, $df=4$, $N=1993$, $p<.001$), thought about committing suicide ($\chi^2=19.02$, $df=2$, $N=2558$, $p<.001$), be unhappy in their relationship ($\chi^2=33.99$, $df=7$, $N=2538$, $p<.001$), report health concerns, emotional/mental issues, and caregiving as their biggest stressors ($\chi^2=45.34$, $df=15$, $N=2558$, $p<.001$), and experience relationship violence ($\chi^2=13.18$, $df=2$, $N=2538$, $p=.001$). MCCs were, however, more likely than non-MCCs to have received mental health counseling in the past year ($\chi^2=51.58$, $df=2$, $N=2558$, $p<.001$).

Conclusion: Despite greater likelihood of seeking mental health treatment, MCCs report more emotional, physical, and psychological distress than non-MCCs. The quality of life among MCCs has the potential to impact care recipients and has public health implications. It is critical that the needs of MCCs are addressed to reduce the burden of this essential role.

2. Physical Health and Rehabilitation

Podium Presentations

1C01: Injury Profile from Anti-personnel Improvised Explosive Devices

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Introduction: The profile of injury caused by antipersonnel landmines (AP-LM) is known. The antipersonnel improvised explosive device (AP-IED) has replaced AP-LM in recent conflicts. The target is injured more severely than bystanders. The goal of this paper is to describe the injury pattern of the target of AP-IED, whom we defined as the dismounted victim of an IED with a traumatic amputation.

Methodology: Information was collected regarding 100 consecutive AP-IED targeted patients, treated at Kandahar Airfield.

Results: Eighty two of the victims, age 25 (18–44), survived. Multiple limb amputation predominated (single 43; double 41; triple 13; quadruple 3) including: foot 4; below knee 73; above knee 75; hip disarticulation 2; unspecified lower limb 15; digit 4; hand 10; below elbow 9; above elbow 7 and unspecified upper limb 5. A mangled upper limb with loss of elbow joint but not the forearm and hand was a unique injury seen. Head, neck, tympanic membrane, chest and abdominal injuries were relatively rare (< 5%) with the exception of eye injuries (11%). Severe soft tissue injury with injection of contaminated soil along tissue planes well above entry sites was universal. Severe injury of the genitalia and perineum was common (34%) with disruption of the pelvic ring occurring in 11%.

Conclusion: The injury profile is markedly worse for AP-IED than AP-LM. Protective equipment has since been extended to include the perineum. Field application of pelvic binders may reduce blood loss. Severe soft tissue injury increases the level of amputation. Deep tissue infections delay definitive surgery.

The complex elbow injury requires innovative reconstruction to preserve function.

1C03: An Assistive Robotic Arm Enabling a Better Quality of Life through Transformational Technology

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Kinova Robotics

Brief Description: The purpose is to present the JACO robotic arm as a relevant and efficient alternative for increasing the autonomy of individuals with upper extremity disabilities.

This technology significantly improves the lives of people with upper body mobility impairments by enabling them to perform more activities of daily living (ADL'S) impacting on life habits and social participation. This is made possible through basic functionalities such as tri-dimensional displacement of the gripper in space, finger opening and closing and orientation of the wrist.

Clinical Outcomes: The effectiveness of JACO has been measured by many users in the following situations where it would have been impossible to carry out ADL's such as: eating and drinking, manoeuvring and moving objects; communicating through a computer or phone; the ability to pick up and read a book or magazine; listening to music or watching TV.

Other outcomes that have been assessed are: becoming less dependent on family and professional support; contributing to living with more autonomy, security and lower stress; extending the time the user can remain in his home before being transferred to a specialized care center thereby creating a possible ROI on the robot arm of 3 years.

Patient Population: JACO is designed for persons with upper extremity impairments. Users are often persons living with spinal cord injuries, advanced muscular disabilities such as muscular dystrophy, amyotrophic lateral sclerosis, spinal muscular atrophy, and some neurological disorders. JACO allows these people to interact with their environment with more safety, independence and effectiveness.

Six members and veterans of the Canadian Forces have acquired a JACO and found it to be effective in daily use by a study done in 2012 by Canadian Forces Health Services Group (CF H Svc Gp)

Conclusion: The use of assistive robot arms in daily life enhances lifestyle and independence by providing increased autonomy, security, self esteem and social interaction to those living with injuries and disorders that cause upper body limitations. JACO users can perform many actions that were previously impossible for them. JACO has been effective in increasing independence and reducing stress on family members as well as reducing the burden on the Health Care System. Hundreds of users have shown that an assistive robotic arm is transformational for those that need it. The CF H Svc Gp report concluded that "all participants have seen an improvement in their competence, adaptability or self-esteem."

1C05: Motor Learning Program to Improve the Resistive Capacity of the Neck

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lege of Canada

Introduction: Flight-related neck pain is a significant health concern for the Royal Canadian Air Force. Flight hours and use of night vision goggles are specific risk factors for neck pain. Strength training has been recommended for pilots, aiming to augment the capacity of the neck to resist effects of inertial forces on head-neck posture. The impulse of the moment of force (I_{MF} , Nms) would be the effective variable of strength, determining the resistive capacity of the neck which would be instantaneously available. The aim of our study was to evaluate the short-term effectiveness of a motor learning program (MLP) to improve I_{MF} of the sternocleidomastoid (SCM), a key muscle to regulate the resistive neck response in three-dimensional space.

Methodology: I_{MF} was calculated from static maximal voluntary efforts produced with ballistic intent (MVE_{BI}), measured using the Multi-Cervical Unit (BTE Technologies; Hanover, MD). The position of a set of anatomical landmarks was digitized (Optotrak, Northern Digital, Waterloo, ON) and used to calculate I_{MF} at the head center of mass (H_{CM}) and base of the upper (C_3) and lower (T_1) cervical spine. The MLP included baseline measurement of I_{MF} along the line of action of the right/left SCM, followed by two sets of five MVE_{BI} for each SCM, a 10-minute rest period, and repeated measurement of I_{MF} at 10mins, 20mins, and 2 days post-training (PT1, PT2 and PT3, respectively). Participants were 12 physically active males: age, 22.6(1.8) years; height, 1.8(6.5) m; weight, 80.9(8.2) kg; neck-to-head circumference ratio, 0.7(0); and hand dominance, 11(right).

Results: The MLP yielded post-training increases in I_{MF} of 46-212%. Training effects were strongest for I_{MF} calculated at H_{CM} ($P \leq 0.001$), and for the non-dominant SCM, with post-training increases 44-75% higher than for the dominant SCM ($P \leq 0.001$). Training influenced I_{MF} at 50ms more strongly than at 200ms ($P \leq 0.001$). Training effect was maintained throughout the post-training period ($P = 0.78$). Training effect was best described by a logarithmic curve, with the greatest gains achieved by participants with lower total moment generating capacity of the neck at baseline ($R^2 = 0.52-0.64$).

Conclusion: Static maximum voluntary efforts produced with ballistic intent may provide an effective stimulus to augment the resistive capacity of the neck. Future work will evaluate training effects on head-neck posture 'in flight', as well as characterize resultant effects on neuromuscular control and the distribution of shear and compressive forces on the cervical spine.

1C06: Pain, Impairments and Functional Limitations Profiles in RCAF Helicopter Aircrew

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Introduction: Neck pain in helicopter aircrew is recognized as a significant cause of functional limitations (prevalence of 57% to 84%). To reduce its prevalence, preventative strategies have started to be investigated. We have initiated in 2013 a randomized clinical trial (RCT) looking at the efficacy of functional and low

load cervical/shoulder exercises for the prevention of neck pain in Royal Canadian Air Force (RCAF) helicopter aircrew, a study that should be completed in 2016. The purpose of this presentation is to describe the baseline profile of neck pain, functional limitations and restrictions of RCAF helicopter aircrews and to discuss some of the problems encountered during this RCT.

Methods: RCAF helicopter pilots and flight engineers were recruited at Canadian Forces Base, Valcartier and Gagetown (n=50). Descriptive statistics were used to analyse the profile of military aircrew including prevalence of neck pain (Nordic Musculoskeletal Questionnaire), self-reported neck disability (neck disability index [NDI]), cervical mobility and maximal isometric strength. T-tests were used to compare cervical mobility and strength between participants with and without an episode of neck pain in the three months prior to baseline evaluation.

Results: Participants recruited were middle-aged (37.6 ± 7.6 years) and 96% male. Sixty-two percent had an episode of neck pain in the previous three months, including 48% with at least one episode in the previous month. Still, self-reported neck disability was low (97% of participants had NDI scores $<10/50$, 50% of these participants had NDI scores $<5/50$). Cervical range of motion was within a normal range. Neck muscles strength ranged from 255 ± 82 Newton(N) to 265 ± 68 N in combined rotation-flexion and from 432 ± 116 N to 439 ± 152 N in combined rotation-extension. No significant differences in cervical ranges of motion and strength were found between participants with and without pain in the last three months. Some major problems encountered included the rate of recruitment, high tempo of operations, and low limit of the load cell used.

Conclusions: Although the prevalence of neck pain reported by RCAF aircrew was very high, the present cohort had very low level of neck disability, showed a normal cervical mobility and, for several participants, had neck muscles strength above reference values. These findings reinforce our approach to focus on training these military to adopt a different neuromuscular strategy to allow a better use of their deep neck muscle stabilizers. The lessons learned in this research will allow us to provide some concrete solutions to implement a specific training to reach that goal.

1F01: Development of an Avatar-based Interactive Virtual Feedback about Movement for the Treatment of Neuropathic Pain

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Introduction: Virtual feedback can improve motor functions and reduce pain. This is relevant to individuals with spinal cord injury (SCI) in whom motor dysfunctions and neuropathic pain are highly prevalent. However, efficacy could be dependent on motor imagery ability and on task complexity, and a clear understanding of how virtual feedback impacts on motor imagery performance is currently lacking. Therefore the objective of this pilot study was twofold: 1- to test the feasibility of providing interactive virtual feedback about gait; 2- to assess the effect

of such interactive virtual feedback on motor imagery performance after SCI.

Methodology: We developed a virtual walking system that can be interactively controlled, providing real-time motion-dependent visual feedback. Briefly, the system uses movement tracking (arm swing during gait imagery) to control a full-body avatar that can walk in a realistic virtual scene. As such, and in contrast to previous studies, this system allows participants to control the initiation and the speed at which their virtual image is walking, i.e. the avatar is synchronized with the subject's motor imagery speed rather than the reverse. In addition, arm kinematics can be used as an objective measurement of gait imagery speed. This system was tested in nine patients (civilians) with a traumatic SCI (AIS A, C and D), who participated in two motor imagery sessions. Tasks consisted of forward (i.e. simpler) and backward (i.e. more complex) walking while receiving interactive versus static virtual feedback. Motor imagery performance (vividness, effort and speed), neuropathic pain intensity (pre, post) and feasibility (immersion, distraction, side-effects) were assessed.

Results: During interactive feedback trials, motor imagery vividness and speed were significantly higher and effort was significantly lower as compared static feedback trials. No worsening in neuropathic pain was observed during motor imagery. No pain alleviation was observed after a single session, but multiple sessions would be necessary to truly assess potential clinical efficacy. Adverse effects were minor, and immersion was reported to be good.

Conclusion: Interactive feedback was feasible and facilitated motor imagery. A better understanding of the relationship between motor imagery and neuropathic pain, and of the mechanisms underlying their interaction, might contribute to more effective interventions and thus to improved rehabilitation after SCI. The avatar-based interactive virtual feedback that we developed could also be transferred to other clinical populations, such as lower limb amputees suffering from phantom limb pain.

1F06: Sex and the Military: An Educational Toolkit to Address the Other Invisible Wounds

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Brief Description: An important facet of the transition of veterans and military families into community life involves the intimate relationship and the integration of the service member back into the family. With medical and technical advances more and more military personnel are surviving, but returning home with visible and invisible wounds that compromise optimal sexual functioning. These *other* invisible wounds of war are not unique to the military, but the secrecy surrounding sexual dysfunction is probably accentuated in this population due to the specific cultural context, which emphasizes hyper-masculinity, invulnerability, and a warrior mentality. Nevertheless, sexual functioning problems have been increasing in military populations over the last decade. To address this problem, as well as a lack of behavioral health provider training in this area, we have developed an educational toolkit that addresses some of the sexual and intimate relationship challenges that injured service

members, veterans, and their spouse/partner may experience.

Clinical Outcomes: The learning objectives of this training program are to:

- Recognize salient issues related to intimacy and sexual functioning in military personnel, veterans, and their intimate partner as reported in current research.
- Identify communication strategies for talking with patients about sexual functioning.
- Recognize intervention strategies for patients with sexual functioning issues, and when to refer to other clinical personnel
- Recognize the need for policy change in the area of sexual functioning and the military, and identify strategies to champion this change.

Patient Population: The educational toolkit was designed for social workers, but are applicable to other behavioral health practitioners, such as nurses and psychologists, who work with or plan to work with military populations and/or those who are at risk for sexual functioning problems. These training materials are designed to be readily used by faculty in such academic programs and integrated with other educational materials.

Conclusion: While sexual functioning problems can occur in any population, military or civilian, this toolkit focuses on the unique features within the military that can impact sexual functioning. With the implementation of the Affordable Care Act and the enhanced focus on comprehensive health care and wellness, the United States as a whole is presented with a unique opportunity to bring sexual health and functioning into a national focus. The integration of care for sexual functioning problems into existing health systems would reflect its intricate involvement in many aspects of health and well-being.

2E01: Clustering of Behavioural Risk Factors in CAF Personnel, and Impact on Adverse Health Conditions

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Canadian Forces Health Services Group

Introduction: Every individual's health is influenced by a multi-faceted web of behavioural risk factors. A better understanding of the interconnectedness of behavioural risk factors would help guide the targeting of health interventions to specific risk clusters. The Health and Lifestyle Information Survey (HLIS) is the only comprehensive population-based health survey of Canadian Armed Forces (CAF) personnel. By collecting information on a vast array of health indicators, the HLIS provides a unique opportunity to study the distribution of inter-related behavioural risk factors in the CAF, and their impact on the prevalence of chronic diseases and injuries.

Methodology: Data from the HLIS 2013/14 were used to identify clusters of behavioural risk factors in the active Regular Force population. Dichotomous variables were created to describe the training practices, physical activity level, obesity status, smoking status and alcohol use of survey respondents. Population weights were used to ensure the survey sample reflected the age, sex, and rank distribution of the entire Regular Force population. Agglomerative hierarchical clustering using Ward's

method was used to group the most similar respondents into increasingly large heterogeneous clusters, and squared Euclidean distance was used to measure similarities between risk factor profiles. Dendograms were produced to visually represent the agglomerative clustering process. Visual inspection of the trees' branches and nodes allowed identification of distinct clusters and sub-clusters. The prevalence of major health outcomes was computed for each distinct cluster.

Results: In both males and females, six clusters were identified: 1) safe and healthy personnel (Males: 14%, Females: 22%); 2) unsafe and healthy personnel (Males: 29%, Females: 34%); 3) physically active obese personnel (Males: 16%, Females: 10%); 4) physically inactive personnel (Males: 12%, Females: 11%); 5) heavy drinkers (Males: 14%, Females: 13%); and 6) smokers (Males: 16%, Females: 11%). In both males and females, the risk of many negative health outcomes (e.g. diagnosed mood disorders; low self-rated general and mental health; repetitive strain injury; chronic neck and back problems; chronic joint, muscle or limb problems; positive screen for major depression; inability to deploy overseas in the last two years due to health problems) was greatest in the physically active obese and the physically inactive clusters.

Conclusion: This study identified six distinctive clusters that best describe the complex distribution of interconnected behavioural risk factors in CAF Regular Force personnel. Health promotion campaigns that target specific clusters of modifiable risk factors may be effective in mitigating chronic disease and injury risk.

2E02: Cardio-metabolic Risk Screening and Lifestyle Intervention Program with the CAF Base in Halifax: The MyHealthCheckup Wellness Program Final Results

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Introduction: The potential benefits of engaging individuals to adopt healthier lifestyles remain largely unrealized due to a lack of information, a shortage of health professionals, and potential costs. We assessed the impact of the MyHealthCheckup web-based wellness program on cardio-metabolic risk factors and mental health indicators among Canadian Forces Base (CFB) personnel.

Methodology: Military personnel at CFB Halifax were invited to participate in multiple 4-12 week, web-based physical activity and healthy weight challenges. They also completed pre- and post-health risk assessments that measured cardio-metabolic risk factors, mental stress, sleep quality, and physical fatigue. During the challenge they tracked daily steps/physical activities and/or food intake and compared their progress to other participants or teams on a virtual course summarized on a google map.

Results: Of the 1506 participants in the program (26% of eligible participants), there were 592 who had their health risk assessed at one of our 13 risk screening days, 1403 who registered on the website, and 859 doing at least 1 challenge. The average user accessed the website 42 times. Among participants who

completed both pre- and postassessments ($n=274$), improvements were observed for a variety of health measures including sedentary behaviour (weekly METs < 720 dropped from 35% to 11%; $p<0.0001$), systolic and diastolic blood pressure (124/79 to 122/77 mmHg; $p<0.05$), weight (88.9 to 88.7 kg; $p<0.05$), poor sleep (Insomnia Severity Index ≥ 8 dropped from 35% to 25%; $p<0.01$), stress (Perceived Stress Score decreased from 11.4 to 10.1; $p<0.0001$), and fatigue (Multidimensional Fatigue Inventory ≥ 16 dropped from 11% to 1%; $p<0.01$). A dose response was observed between the number of website visits and improvement in stress score ($p<0.001$) and sleep score ($p<0.01$).

An evaluation survey was completed by 241 participants to rate the various website components on a scale of 1-5 (5=best). Average scores included the usefulness of the screening event (4.0), the educational modules (3.7), and the challenges (3.8 to 4.0), as well as, ease of use (3.8) and fun factor (3.8). The overall experience was considered positive or very positive by 74% of participants and 73% of participants found the program to be better or much better than other health initiatives held on the base.

Conclusion: The MyHealthCheckup with CFB Halifax effectively increased daily physical activity levels while improving blood pressure, weight, sleep, stress, and fatigue. It also had a high participation rate and high user ratings.

2E03: Measuring up? The Current Health Status of CAF Personnel

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Introduction: A healthy, fit and deployable military force is an essential component to mission success, both domestically and internationally. To optimize the health and well-being of Canadian Armed Forces (CAF) personnel, information is required to identify key areas for improvement. The Health and Lifestyle Information Survey (HLIS) is a quadrennial population-based survey that provides information on the current health status of CAF personnel. Previous surveys have identified core health issues in the CAF.

Methodology: In 2013, 4,312 Regular Force personnel were randomly selected to complete a paper-based cross-sectional survey. The sample size was calculated to obtain adequate precision within $\pm 3\%$ of the true estimate by sex and rank at a 95% level of confidence. To adjust for nonresponse, a differential response rate for oversampling was used based on age, sex, and rank. A consultative process with subject matter experts was used to revise the questionnaire content. Validated survey instruments were used when possible. Modifications to the questionnaire were minimized to allow for comparisons to previous HLIS surveys. The survey was piloted for content and face validity and revised accordingly. To maximize the response rate, a prenotification letter, a survey package and two survey reminders were sent to participants. Data were weighted to reflect the age, sex, and rank distribution of the Regular Force. Descriptive statistics were used to summarize the data and regression techniques were used to establish statistical significance at the 5% level between key demographic variables and the outcome of

interest. Direct standardization was used to compare results between previous surveys conducted in 2004 and 2008/09.

Results: After adjusting for ineligible participants, the response rate was 60%. The initial key findings of the only general population health survey of the CAF will be presented. The results will highlight the most prevalent conditions affecting military personnel and compare these results to historical findings from 2004 and 2008/09. Particular attention will be given to those conditions which have been identified in the past, in terms of their prevalence and/or their associated burden of disease, such as physical inactivity, obesity, tobacco use, alcohol use, and injuries.

Conclusion: The 2013/14 HLIS will provide an overall picture of the current health status of the CAF. These findings in conjunction with 10 year trends will help identify emerging health issues, prioritize areas for intervention, and help direct policy and program development and evaluation.

2E04: The FORCE Evaluation Incentive Program: Aiming Beyond the Operational Standard

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Introduction: In 2013, the Canadian Armed Forces (CAF) implemented the FORCE Evaluation, a field expedient fitness test designed to predict the physical requirements of completing common military tasks. Given that attaining this minimal physical fitness standard may not represent a challenge to some personnel, a fitness incentive program was requested by the chain of command to encourage fitness over and above the minimal standard. Though the initial mandate was to develop an individual rewards program, as research progressed, it was noted that a group rewards program may provide additional benefits to the CAF.

Methodology: In order to structure the individual rewards program, the results of the FORCE evaluations from 2013-2014 ($N=35,451$) were compiled to produce frequency distributions by gender and 5-yr age groups. Age and gender-specific scoring tables were then developed for each of the four FORCE Evaluation components, in order to produce an overall operational fitness score out of 400 points. The entrance to the bronze category was established at the median score, with silver, gold and platinum categories representing 1, 2 and 3 standard deviations above the mean respectively for their age and gender group. In order to obtain information on preference for the nature of rewards, field fitness staff asked all CAF personnel what rewards they would find motivating if they were to perform over and above the minimal standard, including options at all levels of autonomy as per Self Determination Theory. Descriptive analyses were performed on these reward choices, by gender and service, and validated during subsequent focus groups. At the group level, the CAF was broken into 7 Commands. Units were then clustered within each command based on operational tempo and time allotted for physical training during the work day in order to compare similar units.

Results: In terms of individual rewards, CAF personnel expressed a preference for promotion board points, paid time off, pins on the uniform and material rewards (t-shirts or gym bags).

At the unit level, personnel indicated a preference for being rewarded together, either with a group activity, recognition at a formal ceremony or a banner/flag to display at their location. The clustering process resulted in anywhere from 1-26 clusters of similar units being compared within each command.

Conclusion: The resulting program is currently being assessed for policy implications and is scheduled to be implemented as a training objective in April 2016, and with the full suite of rewards in April 2017.

2E05: The Occupational Fitness Standards Tool: Supporting Evidence-based Medical Assessments for Serving Members and Veterans

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Brief Description: Occupational Fitness Standards (OFS) are a part of the medical standards for each Canadian Armed Forces (CAF) occupation or Military Occupational Structure Identification (MOSID). They consist of a list of essential tasks that a member must be able to perform in order to remain in that occupation. A recent review of all CAF occupations has been completed, with data characterizing their respective physical, environmental, and psychological demands. This information is used by the CAF to assess medical fitness, which occurs when a member attends a Periodic Health Assessment or when a member is ill or injured. At each attendance, an occupational medicine assessment is performed, to determine medical fitness, in conjunction with any medical employment limitations assigned. An interactive tool has been developed to facilitate access and use of this information by CAF stakeholders. This information can also be used to complement rehabilitation for a return to work, or to provide guidance to retain or re-muster a member towards a more suitable occupation. Implementation of these task lists and interactive tool has also been approved by Veteran Affairs Canada (VAC) in order to improve their file adjudication process. For VAC, this information provides a better understanding of CAF occupation demands and facilitates the linkages between member's condition(s) and CAF employment.

Clinical Outcomes: Although final implementation of the OFS tool for the CAF is still pending, progress continues; including joint working groups with Directorate of Medical Policy/Medical Standards (D Med Pol/Med Stds) physicians, Canadian Forces Morale and Welfare Services (CFMWS) and VAC personnel, including a comparison of existing files, to determine if the OFS tool provided them with the information they required to make informed, objective decisions for medical fitness. Decisions on existing files were compared to conclusions made using the new information with positive results. VAC will implement the OFS interactive tool to provide their adjudicators with readily accessible, consistent information on CAF occupations.

Patient Population: The OFS tool will benefit both CAF members currently serving, in the process of releasing, and those who are applying or will apply for VAC benefits in the future. This information will also benefit CAF and VAC stakeholders responsible for career implicating decisions at various levels of a

member's CAF employment.

Conclusion: The OFS tool benefits the CAF and VAC by providing an additional resource to assist with occupational medicine/career decisions and VAC disability pension adjudication, to the benefit of CAF, its members, Veterans, VAC and other stakeholders.

2F01: Implementation and Evaluation of Chiropractic Services into the Canadian Forces Health Services

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Introduction: Musculoskeletal conditions negatively affect the health of Canadian Armed Forces (CAF) personnel. They are a main cause of lost productivity due to sick parade attendance and lost duty days. The probability of returning to full duties decreases with time spent away from duties and the potential long term sequelae include limited duty assignment and early termination of service. The significant burden of musculoskeletal conditions on personal, community and health care resources in the CAF is incentive for the implementation and evaluation of an innovative health care service for the management of musculoskeletal conditions and return to duty in CAF personnel. The new service will be an inter-disciplinary, team-based patient-centered health care program that includes chiropractic services. Chiropractic care will be delivered in a collaborative team practice based upon the findings and experience of allies who have introduced chiropractic services in the US Veterans Administration. The overall objective of this study is to evaluate a new healthcare service in a Canadian military setting.

Methodology: The objectives of this study are: to determine the extent and nature of chiropractic services required within the Canadian Forces Health Services Group; to implement a collaborative program of chiropractic services; to evaluate the effects of the implemented services; and to explore how the work disability paradigm can be adapted to address sickness absences and return to duty resulting from musculoskeletal conditions in the CAF.

A participatory action research framework will be used to develop and implement chiropractic services utilizing bi-directional involvement of stakeholders. The iterative nature of this framework allows for implementation challenges to unfold and be addressed during the study period. Once the extent and nature of chiropractic services has been determined, a preferred implementation base(s) will be selected. Chiropractic services will be introduced with adjustments made to the model of care as indicated through stakeholder feedback. Effects of the implementation of chiropractic services will be evaluated using an interrupted time series study design. During this phase health care resource utilization and return to duty data will be collected. Finally, we will explore how the work disability paradigm can be adapted to address sickness absences and return to duty resulting from musculoskeletal conditions in the CAF.

Results: Preliminary results of model implementation will be presented.

Conclusion: The study aims to implement a model of interdisciplinary chiropractic services, assess its outcomes and explore avenues to address sickness absence and return to duty in the Canadian Forces Health Services.

3C01: A Collaborative Care Model in the CAF: Better Communication for All

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Brief Description: The inability to effectively collate relevant medical information presents a risk to treatment when this information is not available to all health care providers. An introduction to this collaborative care model will provide an overview of a template that can be utilized for the gathering and sharing of information based upon the World Health Organization (WHO) International Classification of Functioning (ICF). The ICF model allows the addition of domains that have been typically absent from current collaborative care and interdisciplinary care plans; including capacity, participation and environmental factors. These factors are all relevant to patient care and in addition, may help to identify psychosocial factors that may be barriers to recovery. If not addressed, these barriers may prevent an increase in functional capacity and a potential return to work and/or duty. Within this model, emphasis is placed on patient goals that enable the care to be patient-centric, thereby increasing the potential for patient compliance.

Clinical Outcomes: The potential outcome measures that can be gathered are numerous and are dependent upon the interests of the particular section/department. For example, the Canadian Armed Forces (CAF) Rehabilitation Program can follow the success of rehab by comparing distinct patient populations or treatment plans over time. Veterans Affairs Canada (VAC) could measure levels of disability/levels of declining functioning of specific occupations from enrolment to release.

Patient Population: The program is geared towards serving military personnel and those transitioning out of the military to civilian life. It provides medical information to the following departments: CAF Health Services Clinics, VAC, Joint Personnel Support Unit.

Conclusion: The CAF Collaborative Care Model will allow for better communication between health care providers when treating patients with multiple, inter-disciplinary needs. In addition, the model will produce information that can be translated into policies and processes that will allow for better management of patient's non-medical needs.

3C02: A Canadian Forces Health Services Group Collaborative Care Initiative: Returning Soldiers to Duty

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Brief Description: Like most health organizations dealing with occupational issues, the Canadian Armed Forces Health Services Group (CF H Svcs Gp) focuses on the assessment and treatment of health conditions and how they may be barriers to full employment. These barriers are written as Medical Employment

Limitations (MELs). They are a form of non-medical information, provided to a member's supervisor, that articulates the "effects of the Canadian Armed Forces (CAF) member's ability to perform expected tasks and duties safely and effectively without jeopardizing the health and safety of others, or compromising unit operational effectiveness". However, the World Health Organization's (WHO) medical experts argue that a clinical focus, primarily on health conditions, leaves important psychosocial factors unexplored in the area of Return to Duty (RTD). The WHO International Classification of Functioning (ICF) provides a framework for incorporating these psychosocial factors.

Clinical Outcomes: Clinical outcomes are expected to include; a more efficient and coordinated approach to assisting members with RTD needs, a higher percentage of sustained RTD, and the achievement of optimal functional levels.

Patient Population: All ill and/or injured military personnel with complex care needs who are working towards full RTD.

Conclusion: Psychosocial factors such as activities (ability to execute tasks/actions), participation (involvement in life situations), environmental (physical, social, attitudinal) and personal (motivations, interests, autonomy, coping) have been noted as factors effecting RTD. To assess and treat injured members in domains beyond those indicated by MELs, the CF H Svcs Gp is currently developing a collaborative approach, based upon the ICF model that will assist in RTD planning.

3C03: Return To Duty Program for Ill and Injured CAF Personnel

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Department of National Defence

Brief Description: The Canadian Armed Forces (CAF) Return to Duty (RTD) Program is a comprehensive reintegration program for ill and injured members which supports their recovery and rehabilitation. The mission of the CAF RTD Program is to promote and facilitate the return to duty of ill and injured members. The goal of the CAF RTD Program is the operational readiness of members.

Clinical Outcomes: In order to be successful, RTD must be integrated with a member's recovery and rehabilitation plans. Early intervention provides the greatest chance of a successful RTD for CAF members. However, that intervention cannot be restricted to clinical aspects of a patient's recovery and rehabilitation. Intervention demands a multidisciplinary approach built on collaboration, professionalism, confidentiality and accountability for all stakeholders. A structured and consolidated recovery, rehabilitation, and reintegration plan should be initiated through close communication among the Chain of Command, Canadian Forces Health Services Group (CF H Svcs Gp), the Integrated Personnel Support Centre (IPSC), RTD coordinator and the ill and injured CAF member. To be successful, the CAF RTD Program must not only meet the needs of the member, but those of the CAF as well. The CAF RTD Program is focused on military duty-related activities, and as such is structured to maximize the satisfaction of the following goals: (a) Individual Goals – Return to full time duties in the CAF; (b) Tactical Goals – Performance of a function in a Unit/Base/Wing; (c) Operational – Overall Unit/Base/Wing effectiveness and efficiency; (d) Strategic – Retention

of CAF training and experience, promotion of trust in leadership and confidence in CAF medical system, and reputation of the CAF as an employer of choice.

Patient Population: All serving members of the CAF who are ill and injured, are eligible for the CAF RTD Program. Although the Program is aimed primarily at members who will be returning to duty in the Regular Force, ill and injured members of the Reserve Force are also eligible to receive support under the CAF RTD Program in accordance with their class of service.

Conclusion: RTD for an ill and injured member is a 'journey' of managed, deliberate reintegration into the CAF workplace. The journey begins when the member is assigned Medical Employment Limitations (MELs) and prescribed RTD by their Health Care Provider. The successful journey ends when the member is returned to the organization fit for full duties.

3C04: The Return to Duty Intervention: An Interdisciplinary Approach for Service Members of the CAF with Physical and Non-physical Disorders

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Introduction: The high number of medical releases in the Canadian Armed Forces has negative implications on productivity, healthcare costs, and health & wellness for service members. Returning to duty can be a complex process, and standardized interventions are either lacking or not evaluated resulting in reduced care for the service members. A pragmatic and standardized approach to return to duty could potentially optimize the retention rate. The aim of this study was to determine the effect of a 10-week interdisciplinary work rehabilitation program on service members of the Canadian Armed Forces with physical and non-physical disorders.

Methodology: A multiple baseline design was used to evaluate the effects of the Return To Duty intervention. This interdisciplinary intervention lasted 10 weeks, and included physical training (3 sessions per week, 2.5 hours supervised and 3 hours non-supervised) as well as health and work literacy sessions of 60 minutes (cognition, nutrition, sleep). Service members at the Canadian Forces Base Edmonton and Cold Lake presenting with Medical Employment Limitations (MELs) with physical or non-physical diagnoses were invited to participate. The primary outcome was return to duty as indicated by a change in MELs, 6 months after completing the intervention. The Four Box Square Test, Patient Health Questionnaire-9 items, Five Times Sit-to-Stand Test, Body Fat, Waist Circumference, Patient Specific Functional Scale, Work Ability Index and Handgrip Strength were analyzed in relation to the primary outcome. These were measured between 3 to 8 times pre-intervention, at week 3, 5, and 8 during the intervention phase and 3 times post-intervention. Analysis consisted of visual observation of graphed results, along with change in MELs 6 months post-intervention.

Results: Twenty-five subjects in 3 cohorts (n=8, n=7, and n=8) were enrolled. The drop-out rate was 17% and session attendance approximately 80%. Amongst all participants (n=23),

only the Four Box Square Test and Patient-Specific Functional Scale showed clinically meaningful improvements. Preliminary analysis (n=8) showed that of participants that completed the intervention, MELs were lowered with 63% returning to duty compared to a current rate between 25% and 50% without the intervention. There was no lowered MELs in participants who did not complete the intervention.

Conclusion: The Return To Duty intervention was an interdisciplinary, pragmatic intervention that seemed to assist the service members with lowering MELs as part of their return to duty plan. This novel standardized intervention may help decrease the burden incurred from medical releases in the Canadian Armed Forces.

4E02: Dietary Intakes of CAF Personnel Consuming Field Rations during a Winter Weather Field Trial

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Introduction: Dietary Reference Intakes (DRIs), designed for the healthy Canadian adult population, are used by the Canadian Armed Forces (CAF) to guide the energy content of food rations provided to personnel deployed to the field for training or operations. The high energy expenditures likely to occur under such conditions are not adequately considered. The nutrient intakes of CAF personnel may be further compromised in light of anecdotal reports that their individual meal packs (IMPs) are often partially eaten or discarded. The objective of this study was to assess energy and nutrient intakes of CAF personnel during a winter weather field trial.

Methodology: Dietary intake of 18 male and female CAF (mean age 32 y) was assessed using the 4-day daily food waste collection method. The nutritional content of IMPs was provided by CAF Directorate Food Services and inputted into ESHA Food Processor program to obtain a detailed nutrient profile of participants' dietary intake. The DRI cut-point method was used to determine the adequacy of dietary intakes.

Results: Average energy intake was 2098±1190 kcal/day, with 53% of total energy from carbohydrates, 33% from fat, and 14% from protein which are within the acceptable DRI Average Macronutrient Distribution Range with the exception of fat. The mean energy intake was below the estimated energy requirement for males and females based on the DRI recommendations of highly active Canadian adults. Energy intake was similar between males and females (p≥0.05). The mean sodium intake was 2803±1728 mg/day, which is higher than the DRI upper limit (2300mg/d).

Conclusion: Considering that energy expenditures for military personnel are higher during field operations and training than the requirements for an average active healthy Canadian, the present study demonstrates the likely inadequate dietary intakes of CAF personnel in a winter weather field trial. Moreover, the high sodium intake of military personnel is a cause for concern, as high sodium intakes have been linked to hypertension, a risk factor for cardiovascular disease. Taken together, these re-

sults suggest the potential for adverse impacts on performance and health.

4E03: Gait Variability following a CAREN-based Intervention for Individuals with a Lower Limb Amputation

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Introduction: Gait training is an important part of the rehabilitation process and the Computer-Assisted Rehabilitation Environment (CAREN) system provides a controlled environment ideal for implementing gait training protocols. The purpose of this research was to evaluate a structured CAREN gait training protocol for slope treadmill walking to improve gait performance for individuals with a lower limb amputation (LLA).

Methodology: Eight Canadian Armed Forces members with a LLA participated in this study. Participants presented with varying motivation, co-morbidities, pre-existing gait deviations, fit and alignment prosthetic device issues, physical fitness levels, strength, balance and amputation levels. Participants' ability to negotiate level and slope ($\pm 5^\circ$ and $\pm 10^\circ$) walking were assessed on days 1 and 8, and 20 minute training sessions were provided on days 2-7. The functional training sessions were individualized to participant's needs by establishing a Lower Extremity Prosthetic Training Consideration framework to ensure therapeutic education and activities were delivered consistently to participants in the CAREN system. To assess walking performance, upper body (arm swing, trunk, and pelvis angles) kinematic variability was examined on day 1 and day 8, where a more consistent (less variable) gait pattern would reflect improved biomechanical performance. Kinematic variability was calculated as the average standard deviation across 30 gait cycles, for each walking condition (-10° , -5° , level, $+5^\circ$, $+10^\circ$). Kinematic variability was compared between day 1 and 8, and compared to a matched able-bodied control group ($n=8$).

Results: Before training sessions, LLA pelvis and trunk variability were not different from the able-bodied control group for level treadmill walking, but were greater for non-level conditions ($p<0.002$). Additionally, LLA arm swing variability was significantly greater than able-bodied, for all walking conditions ($p<0.003$). After training sessions, LLA walked with significantly less variable upper body gait patterns ($p<0.05$), for all walking conditions except -10° . Although LLA participants reduced upper body variability after training sessions, variability was still significantly greater than able-bodied participants ($p<0.02$).

Conclusion: The findings in this research suggested that the therapeutic education and functional strengthening throughout the six gait training sessions resulted in gait patterns closer to able-bodied. Kinematic variability may be a good metric to track gait performance across individuals with varied functional abilities and rehabilitation goals. Finally, the information obtained will help optimize therapeutic protocols, inform decisions related to the future use of the CAREN, and provide a scientific basis for moving forward with the use of this system for other patient populations.

5D01: Early Results from a New Initiative to Study the Health of Military Families in Ontario and Access to Healthcare using Administrative Healthcare Data

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Introduction: Canadian military spouses have identified accessing and maintaining high quality family and specialist healthcare as a key disincentive of mandatory family relocations, citing the re-establishment of medical services as the number one concern of a new posting. Although these challenges have been consistently highlighted, population-based research has not been performed to investigate the scope of the problem and the potential negative impact it has on the health of military families. In collaboration with the Canadian Institute for Military and Veteran Health Research and the Institute for Clinical Evaluative Sciences, we have identified, for the first time, a population-based method of identifying military families in Ontario.

Methodology: This is a retrospective cohort study of the healthcare utilization of military family members (spouses and dependents) in Ontario using provincial administrative data. Spouses and dependents of active Canadian Armed Forces members will be identified using codes housed at the Ministry of Health and Long Term Care within the Registered Persons Database. The cohort will comprise of families who are new registrants for a health card in Ontario from 2007, who provided documentation to waive the three month waiting period. The administrative datasets will contain information on demographic characteristics (age, gender, socioeconomic status, geographic region of residence in Ontario), and summary descriptions of healthcare use (e.g. proportion with a family doctor, continuity of care, proportion rostered to a primary care team). Specific measures of healthcare utilization include physician visits (family physicians, specialists), hospital admissions, surgical and non-surgical procedures, emergency room visits, mental health service use, and preventive health services (e.g. pap tests, annual checkups, vaccinations). Descriptive statistics will be reported, along with measures of error. Comparisons of the measures of healthcare utilization will be made between an age- and sex- postal code matched non-military population and the cohorts using appropriate multivariate statistical models to adjust for potential confounders (age, gender, socioeconomic status).

Results: We have identified a means of studying the health and healthcare service use of Canadian military families stationed in Ontario. We plan to present data describing demographics and usual healthcare utilization patterns following registration for a provincial Ontario Health Insurance Plan card.

Conclusion: A description of the current health and healthcare service use of military spouses and children could reveal gaps in the provision of healthcare that require remediation. Understanding how relocations impact the continuity of care and overall health of military families will provide a baseline to study interventions targeted at facilitating access to primary and specialist healthcare for military families in the future.

5D02: Extreme Accommodations in Return to Duty: An Approach for Military Personnel with Poly Trauma

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Brief Description: Current literature (Gibson, et al, 2010; Kaplan 1998; King, 1998; Rudy, 1996; Sullivan, 2006; Swinkles 2006; Waddell 2000, 2002) indicates the process of work accommodation for employees with extreme injuries, involves context-based, situational functional assessments (SFA). SFAs are being used to evaluate the physical, psychosocial, cognitive, environmental and vocational demands of severely injured civilian emergency personnel (e.g. RCMP, Police Services, and Emergency Medical Services). An SFA is in line with the International Classification of Functioning Disability and Health (ICF) vocational rehabilitation core sets and guides rehabilitation clinicians to design return to work accommodation plans that often surpass the typical functional capacity evaluation reports. The SFA are conducted out of clinic, are brief, and provide other treating clinics with information to form their rehabilitation plans in relation to the demands of the work.

Clinical Outcomes: SFAs have the potential to lead to Return to Duty (RTD) and sustained RTD. Further, using an SFA approach allows for a rehabilitation that can assist with achieving optimal function. For those who cannot return to duty, an SFA can assist with a smooth transition to civilian work.

Patient Population: SFAs are currently applied in the civilian emergency personnel workplace but have potential with severely injured military personnel desiring to RTD.

Conclusion: The SFA process when used to determine extreme work accommodations has the potential for those military members (1) currently being treated by multiple Canadian Armed Forces rehabilitation and medical professionals (physical and mental health) (2) have a desire to return to duty and (3) require additional, more in-depth assessment for RTD purposes.

5D03: The Effects of Age and Gender on Stress and Inflammatory Marker Levels in Members of the CAF

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Introduction: Members of the armed forces are susceptible to increased levels of stress due to their operational environment, deployments, postings, etc. Stress increases the levels of stress hormones and pro inflammatory markers which can have detrimental effects on cognitive and physical performance and increase the risk for cardiovascular disease. Levels of stress and inflammatory markers are known to increase with age and be different in males and females in the general population. The purpose of this study was to investigate the effects of age on levels of stress hormones and pro inflammatory markers, and the differences between males and females among members of the CAF.

Methods: This project is a part of a larger study investigating the occurrence of stress and inflammation in the Canadian

Armed Forces (CAF). Blood samples were collected in the morning from a total of 332 members of CAF, and analyzed for levels of cortisol, CRP, adiponectin and IL-18. For analysis, males and females were split into four age groups, 19-29, 30-39, 40-49, and 50-59 years.

Results: There was no difference between age groups for either men or women for CRP, adiponectin and IL-18. Although there was no difference in cortisol values between age groups among women, the male 50-59 year age group had significantly lower cortisol values than the 19-29 and 30-39 year age groups ($p \leq 0.001$ and $p \leq 0.01$ respectively). No difference was observed between the 40-49 years and 50-59 years groups. There was a significant difference between males and females in plasma adiponectin, with higher values observed in women compared to men for the age groups 19-29 (10.0 ± 9.4 vs 17.2 ± 11.8 pg/ml, $p \leq 0.05$), 30-39 (7.0 ± 7.7 vs 15.6 ± 10.4 pg/ml, $p \leq 0.01$) and 40-49 years (11.7 ± 10.3 vs 18.1 ± 8.9 pg/ml, $p \leq 0.05$). In the age group 50-59 years the difference was no longer significant. No significant difference could be observed between males and females for cortisol, CRP or IL-18.

Conclusion: Results show that contrary to observations in the general population, members of the CAF do not seem to exhibit elevated levels of cortisol, CRP and IL-18 with increasing age. Next step in the process will be to determine if a relationship exists between levels of inflammatory and stress markers and physical performance.

5D04: Exploring Elements of Quality Sport Programs for Military Veterans with a Physical Disability

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Introduction: Sport participation among military Veterans with a physical disability has increased due to a desire to harness the physical, social, and psychological benefits of sport for recovery (Brittain & Green, 2012). An important consideration for sport participation for individuals with a physical disability, including Veterans, is that there be access to the same quantity and quality of participation as that available to individuals without a disability. While quantity is easily described as the amount of sport participation, it is not clear how quality participation is understood and defined. Therefore, the purpose of this study is to explore what elements are important for quality sport programs according to military Veterans with a physical disability.

Methodology: Eighteen Veterans with a physical disability (Age = 44.72; SD = 11.98) from Canada ($n=3$), the United States of America ($n=6$), and the United Kingdom ($n=9$) were recruited through Veteran organizations and social media. Researchers recruited Veterans who took part in sport, and represented a range of potential sport program contexts, including therapeutic recreation programs, elite or competitive sport programs, and physical challenge activities. Participants were asked to take part in two interviews. The first interview was structured, with the focus of building a timeline of the participant's sport experiences in order to understand the types of programs in

which the participant had taken part. The second interview was semi-structured, and explored potentially important indicators of quality such as (a) the environment; (b) relationships; and (c) involvement. All interviews were recorded and transcribed verbatim. Data were analyzed using a thematic analysis (Braun & Clarke, 2006).

Results: Key themes and sub-themes were generated which provide clear indicators of what elements are important for the development of quality sport programs for Veterans with a physical disability. These themes include accessibility, consideration of the other individuals present in the Veteran's social environment, and the Veteran's role in the program.

Conclusion: This study fills critical gaps in knowledge about Veterans' views of what constitutes a quality sport program. By understanding what quality means for Veterans themselves, researchers and practitioners can aim to develop sport programs that better meet the needs of Veterans in order to continue to support recovery and post-injury growth among Veterans with a physical disability.

6D03: Sick Leave in the CAF: Health Risk Correlates, Operational Impact and Economic Cost

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Canadian Forces Health Services Group

Introduction: The maintenance of a healthy and deployable military is essential for the production of national security and expeditionary force projection. Although sick leave and excused duty (SL/ED) are oft-used administrative tools for authorizing convalescence among military personnel, the institutional, occupational and behavioural disparities in leave have not been well studied in the Canadian Armed Forces (CAF). The introduction of an electronic medical record combined with modern epidemiological processing affords a novel method of understanding the contributing risks and economic impacts of medical-related leave among service men and women.

Methodology: Using health consultation and assessment data from the Canadian Forces Health Information System (CFHIS), we extracted 61,135 reports of SL/ED for CAF Regular Force personnel between January and December 2014. Current tobacco use and anthropometric status were collected from a database of 263,015 periodic health examinations and dental visits and compared to the CAF Master Patient Index, a longitudinal repository of military service records. Mixed-effects Poisson regression was used to estimate the daily rate of leave for Royal Canadian Navy (RCN), Royal Canadian Air Force (RCAF) and Canadian Army (CA) bases and wings after adjusting for tobacco use, body mass index (BMI) and demographic and occupational covariates. Economic analyses used the DND Cost Factors Manual 2014-15.

Results: On a given day in 2014, nearly 1.4% of CAF Regular Force personnel were lost to SL/ED (Males: 1.2%; Females 2.9%). The daily prevalence of SL/ED was lower for males and females in the youngest age group (18-29), and higher at older ages (50-59). Substantial variation in average SL/ED was observed within RCN (0.3%-1.1%), RCAF (0.3%-1.0%), and CA (0.2%-2.9%) bases and wings. In total, 246,870 work days and \$69.1 million were lost to SL/ED among CAF Regular Force personnel.

The use of tobacco increased the overall incidence of SL/ED by 18%, and this effect was stronger for males (30% increase) than females (14% increase). Annually, 10,735 days of SL/ED and \$3.0 million in personnel costs were attributable to tobacco use. Similarly, obesity (BMI>30) was related to a 31% increase in SL/ED (Males: 46%; Females: 25%), 27,659 excess days of annual SL/ED and \$7.7 million in personnel costs.

Conclusion: Sick leave and excused duty impact negatively on effective force strength, and degrade the response capacity of RCN, RCAF and CA. Prudent investments in evidence-based health policy and promotion are likely to reduce both the operational and economic cost of SL/ED among CAF personnel.

Poster Presentations

P106: Using a Robotized Ankle-foot Orthosis to Measure Ankle Proprioception during Walking: A Reliability Study

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Introduction: Evaluation of lower limb proprioception is usually done in static conditions. However, considering the importance of sensory gating during movements such as walking, it would be important to determine if proprioception can be reliably estimated during actual walking. One way of measuring proprioception during walking is to evaluate the capacity of individuals to detect movement errors resulting from external perturbations. The present study therefore addressed two basic research questions: 1) what is the threshold for movement error detection during walking?; and, 2) what is the reliability of the measurement of error detection at the ankle?

Methodology: Twenty healthy participants were tested twice within a 2-7 days interval. On each visit, they walked on a treadmill for 2 periods of 6 min. while wearing a robotized AFO (Noel et al., 2008). Short duration (150 ms) force perturbations of varying amplitudes (range: 1-7 Nm; resulting in 1-12 deg ankle angle deviations towards dorsiflexion) were applied during the swing phase of gait, once every 5 to 10 strides (pseudorandom sequence). Participants had to press a hand-held button when they felt the perturbations. Participant responses, ankle angular displacement, and applied torque were recorded. To determine error detection capacity for each participant, % detection was plotted as a function of ankle deviation. A sigmoidal curve was fitted to individual subject data (n=100 perturbations/subject). Detection threshold was interpolated from the curve at 50% detection. In addition, intraclass correlation coefficient (ICC) was calculated to determine the test-retest reliability of the detection threshold.

Results: Median detection threshold was 5.25 deg (range 1.04 - 9.14 deg). The ICC of the detection threshold was 0.792, indicating good reliability.

Conclusion: This pilot study suggests that a threshold for movement error detection can be reliably obtained during walking in healthy subjects. This detection threshold is higher than what is reported during static tasks, likely reflecting the sensory gating occurring during movement, and emphasizing the need to per-

form this assessment during walking. Further studies will now be conducted to determine if this method can be used as a tool for proprioception assessment in clinical populations.

P107: The 2014 RCAF CH-146 Griffon Aircrew Musculoskeletal Trouble Survey: The Story Continues

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Canadian Forces Health Services Group

Introduction: Neck and low back trouble has been problematic for Royal Canadian Air Force (RCAF) aircrew for more than a decade. A survey of musculoskeletal trouble within CH-146 Griffon helicopter aircrew supports this notion. At the 2014 MVHR, a related analysis of RCAF population data was presented covering pain mitigation strategies. Pilots are seated during flight, and restricted by safety belts while monitoring instruments and controlling the collective, cyclic and rudder pedals. The Flight Engineer (FE) duties are physical in nature: opening doors, leaning out the aircraft to scan, and kneeling for instrument checks as examples. The differences in physical demand between duties may influence the onset of trouble; however trouble still occurs in both trades.

Methodology: An online questionnaire was used to gather data on aircrew experiences with musculoskeletal trouble. It looked at demographics, flight experience, exercise, helmet-mounted equipment, helmet fit and the symptoms and consequences of their manifested musculoskeletal trouble in specific body locations. An independent t-test compared means between trouble or no trouble groups, FE and pilot groups, and FE and pilot subgroups with trouble or no trouble. Non-parametric correlations defined relationships between certain variables.

Results: A total of 233 participants were included in this study. Demographics were not different between the pilot and FE groups, nor within the groups reporting trouble or no trouble in specific body locations. At the first occurrence of neck and low back trouble, FEs have less flight hours and less years flown (accumulated) compared to pilots. Grounding and benching was a consequence of manifested trouble and was linked to pain intensity levels reported by aircrew for their worst occurrence of trouble. The frequency of preventive exercise in the previous 12 months was larger within the neck and shoulder trouble groups compared to the no trouble group. The frequency of preventive exercise also had a weak positive correlation with neck pain intensity at the time of the survey, length of time with trouble, and trouble preventing work.

Conclusion: FEs are developing trouble with less years and hours flying than pilots, even with no age differences between the groups. The effect may be related to the different physical demands between pilots and FEs. The frequency of preventive exercise in the previous 12 months was larger within the trouble group and corroborated by participant comments. It was suggested that exercise frequency was increased to alleviate trouble rather than the higher frequency causing the trouble.

P108: Clinical Effectiveness of Directional Preference to Guide Treatment in CAF Members Suffering from Low Back Pain

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Introduction: Low back pain (LBP) is the leading cause for disability in Canadian Armed Forces (CAF) members suffering from musculoskeletal injuries. In addition to causing significant suffering for individuals, it causes a considerable economic burden due to work loss and health care requirements. Consequently, efficacious and cost-effective management strategies for LBP are essential to maintaining operational capabilities. Physiotherapy treatment guided by patient-response criteria has been shown to improve outcomes in the general population and is highly recommended in LBP practice guidelines. Amongst different criteria, directional preference (DP) and centralization of pain (CP), two associated phenomena, have been shown to be particularly useful to guide treatment and are now the first step in many classification systems. The utility of these criteria has not been assessed in the CAF although physical, occupational and psychological stresses differ considerably from those observed in the general population.

Methodology: A pragmatic quasi-experimental study including 44 consenting CAF members with any type of LBP will be conducted at Canadian Forces Base Borden. Participants will receive currently available physiotherapy interventions, either at the physiotherapy section of 31 CF H Svcs C (experimental group) or in the community (control group). Availability and caseload will be the only criteria that determine group allocation. Patients in the experimental group (n=22) will be assessed for DP and receive interventions matching their particular DP. Patients without a confirmed DP at the 4th visit will be treated based on current guidelines. Patients in the control group (n=22) will receive usual care as determined by their treating physiotherapist. Data will be collected using self-administered questionnaires (pain, function, kinesiophobia, medication consumption, satisfaction with treatment) and health records (work status, number of days off work/ on light duty, health care utilization). In addition to baseline, groups will be compared after one and three months.

Results: It is expected that treatment guided by DP is more effective than usual care to reduce pain, health care utilization, and work loss, and that at least 75% of the patients in the experimental group will have a DP suggesting that this criterion will be highly useful to guide treatment in the vast majority of CAF members.

Conclusion: This study will explore if the management of LBP guided by DP, and recommended for the general population, is also applicable to the unique environment of the CAF. As a result, these findings will inform policymakers and clinicians on effective management strategies of CAF members suffering from LBP.

P109: Athletes with History of Concussion Exhibit an Altered Inflammatory Profile

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Introduction: The chronic effects of concussion, a form of mild traumatic brain injury (mTBI), are not well understood. Evidence

suggests mTBI triggers the activation of central and peripheral immune cells, leading to the infiltration of neurological tissue and subsequent release of inflammatory mediators. Evaluating immune markers in the peripheral blood may provide useful information reflecting brain immunopathology. To date, the natural history of immune responses following mTBI are poorly understood. The purpose of the study was to compare profiles of circulating inflammatory markers in uninjured athletes with and without a history of concussion.

Methodology: Peripheral blood was sampled from 62 uninjured athletes ($n=35$ male; $n=27$ female), stratified into two groups based on previous concussion history ($n=30$ yes; $n=32$ no). Team therapists obtained relevant medical history during pre-season administration of the Sport Concussion Assessment Tool (SCAT) 3. An ultra-sensitive MULTI-ARRAY[®] immunoassay platform was used to assess plasma concentrations (pg/ml) of 19 cytokines: interleukin (IL) -1 α , -1 β , -2, -4, -5, -6, -7, -10, -12p40, -12p70, -13, -15, -16, -17A, interferon-gamma (IFN- γ) tumor necrosis factor (TNF) - α , - β , granulocyte macrophage colony-stimulating factor (GM-CSF), vascular endothelial growth factor (VEGF); and 10 chemokines: eotaxin, eotaxin-3, macrophage inflammatory protein (MIP) -1 α , -1 β , monocyte chemoattractant protein (MCP) -1, -4, macrophage derived chemokine (MDC), thymocyte- and activation-regulated chemokine (TARC), interferon gamma-induced protein (IP) -10, and IL-8.

Results: Chemokines IP-10 and MCP-4 were significantly higher in healthy athletes with a history of concussion compared to athletes with no previous concussion history. No significant differences in any cytokines or neuroinjury markers were observed between groups.

Conclusion: Athletes with a history of concussion display an altered systemic inflammatory profile compared to athletes with no previous concussions. While chronic low-grade inflammation is generally considered a health detriment, the role of the inflammatory response following concussive injury with respect to long-term neuroprotective or neurodegenerative effects remains unclear.

P110: Establishing a Dementia Unit and the Effects on Polypharmacy, Cognition and Mortality

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Introduction: This study examined the effect of what the creation of a dementia wing and reconfiguration of the remaining rooms had on polypharmacy, cognition and mortality rates in a population of Veterans. In theory, this move should enable staff to optimize behavioral approaches and reduce polypharmacy. This unique research opportunity provided much needed data on a captive population who have not been studied this way previously. This study may impact current nursing home practice/design in our province.

Objectives: Primary outcome: the effect on medication usage. Secondary outcomes: (i) any measureable benefits to cognition as measured by sMMSE (standardized Mini Mental Status Exam),

(ii) mortality rates, (iii) nursing satisfaction.

Methodology: Primary outcome - comparison of subgroups (newly created dementia wing vs regular wards): (i) the number and doses of medications (regular and as needed); (ii) the types of medications used (antipsychotics, anxiolytics, sedatives, bowel meds etc.). Secondary outcomes: (i) cognitive scoring as per routine annual review with the sMMSE of each resident, (ii) mortality rates, (iii) frailty scores between the groups, (iv) nursing satisfaction survey pre- and post- move.

Time points: pre-move, at 6 months post-move, 12 months post-move, and at 18 months post-move.

Time point comparisons: (i) pre vs the various post move scores for medications, (ii) annual sMMSEs (iii) 20-month pre- vs 20-month post- for mortality rates, (iv) pre- vs 1-4 month post- for nursing satisfaction surveys.

Results: N=46 (42M, 4F), 39/46 cognitively impaired (6 mild cognitive impairment, 21 Alzheimer's, 8 mixed, 2 Lewy-Body, 2 Progressive Supranuclear Palsies)

Primary outcome: Preliminary analyses – no overall change in total number of medications pre- and post- move; but there appears to be reductions in some classes of medications post-move (e.g. cardiovascular drugs). Analyses are ongoing - final analyses will be available at the conference. Secondary outcomes: (i) no change in sMMSEs, (ii) mortality rate 1.25 (1 death/800 days) pre-move vs 0.94 (1 death/1059 days) post-move, (iii) no difference in frailty scores, (iv) no difference in nursing satisfaction.

Conclusion: Preliminary results indicate no change in overall medication use, but possible reductions in sub-classes of medications – further analyses are ongoing. Having a wandering dementia unit has not affected patients' cognitive scoring nor frailty scores. The lower mortality rate may be due to less stress/conflict with other residents, increased ambulation, or a sample size aberration. There is no change in nursing satisfaction. Small sample sizes may be a factor.

P111: Factors Influencing Tobacco Use among Canadian Army Personnel

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Introduction: Although it is evident that smoking is detrimental to health, it remains prevalent in the Canadian Armed Forces (CAF). Despite smoking cessation programs in place across the CAF, the rate of tobacco usage has not decreased, especially in high-tempo army bases. Anecdotally, the different operational environments have specific factors that promote or hinder tobacco consumption. There is currently limited understanding regarding the socio-cultural influences of tobacco and smoking cessation medication usage within the CAF.

We herein present a study (in progress) that aims to provide descriptive data on the influences of tobacco use and attitudes surrounding use of medications to aid in smoking cessation.

Methodology: Members being posted out of or released from Canadian Forces Base (CFB) Wainwright, CFB Valcartier, CFB Shilo

and Garrison Petawawa will be asked to complete an anonymous survey regarding their tobacco use, any changes in usage during the posting, beliefs and opinions surrounding tobacco use and also beliefs and opinions of smoking cessation medications. A descriptive analysis will be performed on survey results.

Results: We intend to conduct this study between June and September 2015 (annual posting season). Results of the study will be available in October 2015.

Conclusion: We anticipate this study to generate information to help us understand the factors that influence changes in tobacco use and also attitudes pertaining to smoking cessation medications on army bases. The analysis of the results will guide the tailoring of future programs targeting specific subgroups of patients most at risk for tobacco use and in turn, increase success rates of smoking cessation.

P112: Design of a Pragmatic Trial Investigating the Effectiveness of Analgesics and Standardized Rehabilitation for CAF Members with Ankle Sprain: CALF Trial - Correlation between Acute Analgesia and Long-term Function following Ankle Injuries

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Canadian Forces Health Services Group

Introduction: Ankle ligament sprains occur frequently in military personnel and account for a significant proportion of their lost work time. Existing literature suggests that the rate and extent of ligament healing may be adversely affected by the use of non-steroidal anti-inflammatory agents (NSAIDs) or other non-NSAID analgesics during the acute phase, whether by influencing inflammatory mediators and/or potentially facilitating asymptomatic overuse of injured tissues. Studies investigating the impact of including analgesics (NSAID or non-NSAID) on the self-reported function in individuals with ankle ligament sprains are limited to short durations and have shown conflicting results. Likely due to the limited recommendations in the literature regarding the use of analgesics in the management of ankle ligament sprains, anecdotal practice variations are widespread throughout the Canadian Armed Forces (CAF). We hereby present the design of a pragmatic trial to investigate the effectiveness of analgesics in conjunction with a standardized rehabilitation program on clinical measures of self-reported function, pain, swelling, ankle mobility, and ankle stability of CAF members with ankle ligament sprains.

Methodology: We will conduct a pragmatic randomized, open-label study using patients recruited at Garrison Petawawa with grade I to II ankle sprains, targeting a sample size of N=160. All eligible CAF members will be provided with a standardized rehabilitation program, then randomized to receive either 1) Acetaminophen 500mg four times daily for 7 days, 2) Celecoxib 100mg twice daily for 7 days, 3) Naproxen 500mg twice daily for 7 days or 4) no pharmacological analgesic. Our primary outcome will be the mean change in the Foot & Ankle Abilities Measure from baseline to 3 months. Secondary outcome measures will include the mean change in the; Visual Analogue Scale, Figure of 8, Wall Lunge Test, Anterior Drawer Test, and the Star Excursion Balance Test at 2, 4 & 52 weeks post-sprain. Health re-

source consumption (i.e. diagnostics, orthopedic interventions) and medical employment limitations (i.e. # of days on excused or limited duties) will also be compared.

Results: The recruitment phase of this study is scheduled to begin in Aug 2015, with preliminary results available in the Fall of 2016.

Conclusion: The results of this pragmatic study will address some of the limitations present in the current research on using NSAIDs or analgesics in the management of ankle ligament injuries, and provide practical clinical guidance to CAF Health Services personnel involved in the management CAF members with ankle ligament sprains.

P113: Evaluation of Simulator-induced Sickness Symptoms and Postural Stability in the CAREN Virtual Environment

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Introduction: While the Computer Assisted Rehabilitation Environment (CAREN) is a valuable virtual reality tool used during rehabilitation, simulator sickness can cause feelings of discomfort and unwanted side effects that limit the effectiveness of training. The purpose of this research was to establish a baseline of simulator sickness symptoms and postural stability after immersion in the CAREN system, for a healthy control population.

Methodology: Thirty-one Canadian Armed Forces members participated in this study. Each participant walked in the CAREN virtual environment for approximately 45 minutes. Symptoms of simulator sickness and postural stability were assessed before the session, at 15 minutes, and at 45 minutes of immersion. Symptoms of simulator sickness were evaluated using the simulator-sickness-questionnaire (SSQ), which rated 16-symptoms across 3 categories: nausea, oculomotor, and disorientation. After completing the SSQ, centre-of-pressure (COP) data were analyzed to evaluate postural stability. Participants completed three dual-limb standing trials, each separated by a period of rest. COP parameters included medial-lateral and anterior-posterior displacement range, 95% predictive ellipse area, and mean velocity. A linear mixed model was used to examine changes in SSQ scores and COP parameters throughout the session (baseline, 15 min, and 45 min).

Results: Total SSQ scores or simulator sickness symptoms were greater after CAREN immersion ($p=0.051$). COP analyses also demonstrated greater COP displacement range and area after CAREN immersion ($p<0.003$), indicating decreased postural stability. However, mean velocity significantly decreased at 15 min compared to baseline ($p<0.003$), and increased at 45 min. Since fatigue could account for an increase in COP parameters and SSQ scores, data were analyzed accounting for fatigue and sweating scores. Forty percent of participants rated more fatigue and/or sweating after walking in the CAREN; however, nearly all participants demonstrated decreased postural stability. When fatigue and sweating scores were excluded, 25% of participants experienced slight symptoms of simulator sickness after CAREN immersion, including eyestrain, headache, difficulty focusing, and dizziness. Although SSQ scores were greater

after CAREN immersion, all participants were able to successfully complete the study without exceeding "slight" or acceptable levels of simulator sickness symptoms.

Conclusion: With appropriate medical supervision and guided therapeutic training, the CAREN system can safely be considered as a therapeutic tool to integrate high level physical activity, without resulting in lasting physical or psychological harm, in a healthy military population. The results from this research also provided useful baseline information of a healthy, non-injured population for CAREN-based clinical assessments and future studies.

P114: From Paralysis to Performance through Perseverance and Partnership: A Case Study; Spinal Cord Injury Physiotherapy Rehabilitation of a CAF Member with Atypical SCI Presentation

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Brief Description: Physical Rehabilitation of actively serving members in the Canadian Armed Forces (CAF) who are facing a complex Spinal Cord Injury (SCI) requires perseverance and partnerships between many personnel including the affected member and their family, civilian centers of expertise and CAF Health Services clinicians. This presentation follows the physical rehabilitation of a military member facing lower extremity paralysis after an atypical presentation of SCI and subsequent emergency neurosurgery. Rehabilitation programming began in an Intensive Care Unit, transitioned to a civilian in-patient rehabilitation setting and eventually to a CAF physiotherapy clinic and community fitness center. Through many levels of coordination, knowledge sharing, communication and dedication by all involved in the teams, the continuing recovery of this inspirational member has far surpassed any reasonable medical expectations. The developed treatment plan has been functionally based, aimed at the achievement of specific patient determined physical goals and part task training including the areas of community mobility and ambulatory training, balance, proprioception, strength and environmental specific exposures.

Clinical Outcomes: Clinical outcomes used to measure success have included physical measurements of range of motion, strength (Manual Muscle Testing) and spasticity (Modified Ashworth Scale). Functional outcomes include BERG balance score, Community Mobility and Balance Inventory, TUGT, 10m walk test, Sit to Stand in 1 minute, Spinal Cord Injury Gait Inventory, FIM scoring and FORCE testing. Goal setting and attainment monitoring as well as physical accomplishment tracking have been pivotal in determining outcomes and monitoring levels of success.

Patient Population: The specific physiotherapy intervention was directed at an active serving Regular Force member with a complex spinal cord injury at the T11 level.

Conclusion: Through personal perseverance, relationship building, individualized goal setting, communications and partnerships with multiple therapists, a unique, challenging and tailored physiotherapy program was developed and implemented leading to significant clinical and functional gains. Because of the efforts and dedication of multiple agencies and clinicians

and the extremely hard work of the member, the outcomes achieved have not only been successful physically but have also been inspirational and profoundly affected all of us involved on a personal and professional level.

P115: Comparison of Two Screening Questionnaires in the Prediction of Low Back Pain Outcomes in the CAF

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Brief Description: In the Canadian Armed Forces (CAF), low back pain (LBP) affects operational capabilities directly (by members accessing healthcare during work hours and by modified member duty status), and indirectly (with medical releases and pensions). Researchers have identified demographic and psychosocial factors as predictors of poor outcome with LBP, and in the progression to chronic pain. Clinical practice guidelines emphasize identifying patients at risk for developing chronic LBP at an early stage. The STarT Back Tool and the Orebro Musculoskeletal Pain Screening Questionnaire are two of the most widely used psychosocial screening instruments. Guidelines suggest using one of these tools to 1) to predict patients' likely outcomes, and 2) to stratify patients to identify the most appropriate care. A multidisciplinary Expert Panel on LBP in the CAF has created a standardized LBP clinical pathway that will include screening patients using these tools. In order to implement this screening on a national level, and to have collaboration among different healthcare providers, there needs to be a significant coordination of resources and efforts. However, to our knowledge, the feasibility of this has not been tested and there have been no studies of the predictive accuracy of these instruments in a military population. This pilot study will test the screening process at one Canadian military base to assess potential barriers and facilitators to widespread implementation.

The purpose of this pilot study is: (1) to assess the feasibility of screening patients in order to stratify care in a physiotherapy clinic setting, and (2) to explore the predictive accuracy of the STarT Back and the Orebro in a military healthcare setting.

Patient Population: CAF members with LBP presenting for physiotherapy care at Canadian Forces Base, Halifax. We will stratify by sick parade referrals (acute LBP) and physiotherapy referrals (subacute and chronic LBP).

Clinical Outcomes: Objective 1) a) % LBP patients with initial data collected: % LBP patients presenting to physiotherapy; (b) % of patients with completed follow up; (c) Use of staff resources (time)

Objective 2) (a) Functional disability (Roland Morris Questionnaire); (b) Pain; (c) Health services utilization; (d) Duty status

Conclusion: This pilot study will provide information on the feasibility of using psychosocial screening questionnaires in CAF members seeking care for LBP, and will provide preliminary results about predictive accuracy of the tools in this population. These results will inform implementation of a LBP clinical pathway in the Canadian Forces Health Services.

P116: A Case Report: Diabetic Cranio-Cervico-Radiculoplexus Neuropathy

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Brief Description: We describe a case of a 53-year-old male with type 2 diabetes mellitus who developed a cervical-radicular neuropathy, with concomitant cranial and phrenic nerve involvement, occurring as a stepwise, monophasic course, in a patient with a presumed remote history of idiopathic CRPN.

Clinical Outcomes: Clinical outcomes in this single case were patient reported measures of pain control, and function, as well as documented motor function, and electrodiagnostic study results. Included literature review will also describe the available case series data available on expected outcome of the same measures.

Patient Population: This case report is relevant to the diagnosis and care of serving and retired military members with new or undiagnosed upper extremity weakness.

Conclusion: Cervical-radicular neuropathy is an immune-mediated vasculitis that can occur in diabetic and non-diabetic patients. In this case, our patient had a stepwise, monophasic illness, which included involvement of his cervical plexus and cranial nerves. Investigations were non-contributory and treatment was conservative, leading to partial distal motor recovery. Although a genetic etiology could not be formally excluded, especially given his previous episode at age 19, the stepwise course within the same year, involvement of other body regions (phrenic and cranial neuropathies), associated weight loss and associated diabetes mellitus favor the diagnosis of diabetic cervical radiculoplexus neuropathy.

P117: Radiofrequency Denervation of the Hip Joint for Pain Management: Case Report and Literature Review

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Brief Description: A 55-year-old male presented with severe pain and functional limitations as a result of left hip osteoarthritis. He had failed multiple treatments while waiting for a hip arthroplasty, including physical therapy, medications, and various intra-articular injections. Thermal radiofrequency lesioning of the obturator and femoral articular branches to the hip joint was offered in the interim. We discuss relevant technical factors for this specific case, review previous literature on hip joint radiofrequency and critically evaluate previous anatomic studies in the context of radiofrequency.

Clinical Outcomes: Clinical outcomes in this single case were patient reported measures of pain control, and function. The first treatment provided significant benefit for a period of 6 months. A second treatment was employed providing only mild to moderate benefit until his joint replacement surgery 4 months later. Literature review revealed studies of low quality secondary to small sample sizes, patient selection methodolo-

gy, inclusion of patients with heterogeneous etiologies for pain, variable needle placement techniques, and lack of measurement of functional outcomes.

Patient Population: This case report is relevant to the care of serving and retired military members with hip joint pain from osteoarthritis.

Conclusion: Hip joint radiofrequency denervation is a promising avenue for adjunctive treatment of hip pain. Further cadaveric studies are required to clarify a multitude of technical parameters. Once these are well defined, future clinical studies should consider pain, functional, and economic outcomes in their design.

P118: Trapezial Ridge Fracture: A Potential Cause of Traumatic Hand Pain

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Brief Description: This case report describes a 48 year old right hand dominant female with left 1st CMC region discomfort that began 1 year prior to assessment when she "hyperextended" her thumb while avoiding a fall. Plain radiographs taken initially showed minimal 1st IP region osteoarthritic (OA) changes with a normal 1st CMC joint.

She had constant severe pain for 2-3 weeks after injury, but this partially improved such that she continued to have difficulty with activities where there was direct pressure over the 1st CMC region. For example, these activities included, changing the position of the handle on an infant car seat or putting on a seat-belt. On exam she had localized pain to palpation on the medial portion of the 1st CMC joint, with normal range of motion and negative grind tests.

Follow up radiographs 1 year later, which included a tunnel view, showed only mild OA of the 1st CMC joint. MRI confirmed degenerative changes of the 1st CMC and a loose body. It is our belief the loose body represents a Trapezial Ridge fracture, and the OA developed subsequent to this intrarticular fracture. Treatment so far has been conservative with activity modification and occupational therapy recommendations regarding bracing and devices. Surgical removal of the loose body, with a view to surgical trapezial resection for the OA if symptoms are unresolved remains an option.

Clinical Outcomes: Clinical outcomes in this single case were patient reported measures of pain control, and function. Imaging findings will be discussed in detail. Literature review revealed studies of low quality secondary to small sample sizes, but will be discussed as well.

Patient Population: This case report is relevant to the care of serving and retired military members with hand pain secondary to a fall.

Conclusion: Trapezial ridge fracture is a rare fracture in patients with 1st CMC region trauma. Early recognition of the fracture, could lead to improved outcomes and reduce the rate of degenerative OA.

P119: The Development of a Health and Work Literacy Component as Part of a Return to Duty Intervention for Ill and Injured Members of the CAF

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Brief Description: Many Service Members (SMs) are medically released from the Canadian Armed Forces (CAF) annually due to physical and mental illness and/or injury. This may be compounded by barriers to participation in their military occupations. Barriers may include pain and stigma as well as decreased cognitive function, psychosocial health, and sleep quality. In response, an inter-disciplinary team at Canadian Forces Base Edmonton developed a Return to Duty intervention for SMs attempting reintegration into the CAF. Within the Return to Duty intervention, the occupational therapist at 1 Field Ambulance designed a Health and Work Literacy component. This was developed utilizing the Canadian Model of Occupational Performance and Engagement (CMOP-E) and utilizing components of multiple models of cognitive rehabilitation. The CMOP-E is a holistic model acknowledging the intertwining of biopsychosocial factors that may contribute to return-to-work success. Cognitive rehabilitation principles were employed as theoretical guides to the educational material targeting cognitive performance.

The content was initially delivered for 60 minutes, once a week for 12 weeks utilizing PowerPoint presentations, videos, and assignments. Goals included enabling a SM to utilize self-regulation strategies of factors such as pain, stress, sleep, exercise, nutrition, and cognitive performance. The Health and Work Literacy component was tailored to be deliverable by health promotion staff and occupational therapists. This allows for maximum utility and deliverability in multiple CAF sites. Return to duty rates and attendance were measured throughout 2 pilots.

Outcomes: After 2 pilots, approximate descriptive statistics were: 1) attendance rate 80%, 2) dropout rate 20%, and 3) return to duty rate 63%. Feedback from the participants was attained through a program evaluation form and interview. Stakeholder input, literature reviews, and outcome measures contributed to the continued development of the Health and Work Literacy component. This resulted in the following modifications: 1) sessions were reduced from 12 to 10, 2) health topics were revised, and 3) participant selection criteria were expanded. These revisions were incorporated into the next 3 cohorts of participants.

Patient Population: The SMs considered for the intervention had multiple physical and/or mental health diagnoses. These participants were identified by the stakeholders as appropriate candidates using eligibility criteria. These criteria included: 1) administrative Medical Employment Limitation longer than 30 days and 2) medical clearance from clinicians.

Conclusion: Additional modifications were completed after the 3 cohorts and will be utilized for future Return to Duty interventions. The development of an intervention for the SM attempting to return to duty is ongoing. The Health and Work Literacy component will continue to emerge through developmental evaluation.

3. Social Health and Wellbeing

Podium Presentations

1A04: Relationships with Parents and the Well-being of Adolescents from Military Families: The Role of Military Stressors and Social Support

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Department of National Defence

Introduction: Previous research suggests that military-life stressors, especially parental deployment and relocations, may negatively affect both adolescents' well-being and the quality of their child-parent relationships. However, there is a lack of understanding about how these stressors affect adolescents from families of Canadian Armed Forces (CAF) members. The Impact of Military Life on Adolescents from Military Families study was conducted to examine the impact of deployment and relocation stressors on the psychological well-being and the quality of child-parent relationships among adolescents from CAF families.

Methodology: The target population was adolescents (from 14 to 19 years old) from Regular Force CAF members' families. A random sample of 3,000 adolescents from Regular Force CAF families was mailed an English and French version of the survey in 2014. Out of the 3,000 adolescents (mean age = 16) who were mailed the survey, 208 adolescents (121 girls, 84 boys, 3 missing) returned it.

Results: A series of hierarchical regressions were performed to predict adolescents' well-being and quality of their relationships with their parents. Relocations stressors and social support from family and friends were found to be important unique predictors of adolescents' well-being. While military stressors negatively predicted adolescent-mother relationships, social support from mother, friend, and military remained significant predictors, over and above the impact of military stressors. In addition, friend support buffered the negative impact of relocations stressors on adolescent-mother relationships. Military-life stressors had very little impact on adolescent-father relationships. Social support from father and from the military organization remained significant predictors of the relationship with father over and above the role of military stressors. Moreover, family and military support during deployment and friend support during relocation buffered the negative impact of stressors on the adolescent-father relationship. Finally, results demonstrated that adolescents perceived their family environment and friends to be supportive, and perceived the least amount of social support from the military.

Conclusion: This research suggests that military life, especially relocation stressors, has an important impact on adolescents' well-being and on adolescent-mother relationships. However, social support from parents, friends, and the military organization play a vital role in making adolescents more resilient during the stresses of deployment and relocations. It is important to encourage military families to seek support within the family and from the military organization, especially during deployment and relocations, and to further examine the availability

and awareness of support programs for adolescents from military families.

1A05: The Impact of Military Lifestyle on Military Families

Dursun, S., PhD, Wang, Z., PhD

Department of National Defence

Introduction: The families of military members face many challenges as a result of the military lifestyle, such as frequent relocation, spousal unemployment and underemployment, and deployment of their military family member to potentially unsafe areas. Since families are impacted by military life, and since they have a profound influence on Canadian Armed Forces (CAF) members and the CAF organization as a whole, the CAF has considered it important to study the impacts of military life on families in support of personnel policies and programs. Director General Military Personnel Research and Analysis studies both the challenges faced by military families and the effectiveness of current CAF programs and services in addressing these challenges. This presentation is an overview of the program of research examining challenges specific to military families. It provides some key findings from the most recent survey of military spouses and compares data collected in two earlier administrations.

Methodology: The Quality of Life (QOL) Survey has been administered three times (2005, 2009, and 2013) to spouses of CAF Regular Force members. The survey assesses the impact of military life on families along several dimensions, including health and well-being, spousal employment, impacts of deployment on the family, and conflict between military and family life. The sample sizes were 1,661 in 2005, 2,084 in 2009, and 1,895 in 2013.

Results: The top five frequently reported issues for CAF families in 2013 were spousal employment (42.7%), primary health care (36.9%), relocation (32.2%), financial stability (30.4%), and childcare (19.4%). The majority (72.9%) of CAF spouses reported being employed, while 4.5% were unemployed and 20.0% were not in the labour force. Military spouses'/partners' resiliency was best predicted by the formal social support received from the CAF. Of the informal social support received, support from their military spouses/partners best predicted resiliency—specifically, feeling loved and cared for, supported and encouraged, and feeling that they could depend on their military spouses/partners. Comparisons with the data from the previous two administrations are presented and discussed.

Conclusion: This study reveals the issues faced by CAF families and provides some insight into the impact of the military lifestyle on the well-being of CAF spouses. The results will assist the CAF in optimizing resources, services, programs, and policies to better support CAF families.

1A06: Family Snapshot: A Descriptive Analysis of Family Characteristics and their Associations with Well-being Based on the CAF Mental Health Survey

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***Abstract not published**

1E06: Candour and Moral Doubt: The Personal Ethics Experience Tool in Ethics Training

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Department of National Defence

Brief Description: Most western militaries have adapted some kind of ethics training. A typical vehicle for practical application of ethics theory has been the use of instructor-authored relevant “scenario dilemmas”, recently supplemented in some cases by online simulations of such dilemma situations (Robinson 2007). In Canada, “stand-alone” ethics training for the Canadian Armed Forces (CAF) has tended to combine principles (core values, models of justification, psychological and situational factors) with application using generic relevant “ethical dilemmas” provided in advance, to be next analyzed by students using the principles.

Over the past year the Defence Ethics Program has experimented with a departure from the provided-dilemma-only approach in an attempt to elicit the most honest expression of ethical concerns, doubts, and questions by course participants in classroom contexts. Limited efforts have been made in other jurisdictions to combine ethics training time with data-seeking about the frequency of wrongdoings or dilemmas actually encountered by service people who participate (e.g. Jans and Cullens, 2010). In the Canadian case, while retaining theoretical elements, participants have been asked to describe their own real experiences of ethical challenge in small group dialogue setting as part of the session content rather than through confidential surveys separately conveyed and later analyzed by the researcher.

Clinical Outcomes: The impact of this design was assessed in terms of the number and gravity of ethical dilemmas identified by the course participants themselves, in comparison with real incidents or concerns offered by participants in the course of pre-written, scenario-only discussion. The rate of real dilemmas volunteered was markedly higher than in classroom sessions where relevant prepared “generic” scenarios were used. An additional, unanticipated outcome was observed in that participants in some classes seemed to feel empowered by the method used to further challenge the subject matter specialist/session facilitator on the grounds that some familiar or serious ethical problems from their work were not satisfactorily resolvable.

Patient Population: Course participants were serving military members either in leadership development training or in ethics refresher training.

Conclusion: It is argued that the outcomes from the method used, although arguably leaving significant doubt in the participants' minds about the adequacy of ethics training as a basis for adequately dealing with the problems they encounter in work, indicate it is a more powerful tool to engage ethical awareness and critical thinking beyond the session than is the traditional classroom method.

1F05: Evaluating the Effectiveness of a Web-based Weight Loss Program among Canadian Military Personnel

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Introduction: Although the majority of Canadian adults are overweight and/or sedentary, developing effective interventions to support the adoption of healthier lifestyles remains a challenge. We evaluated the acceptability and effectiveness of a web-based weight loss program on Canadian Forces Base (CFB) Halifax. The program promoted increased physical activity, healthy eating, and low-Glycemic Index (low-GI) energy bars to replace a daily meal or snack.

Methodology: Military personnel were invited to participate in a 4-week weight loss challenge. After recruiting a partner to join their team, participants competed against other teams of two on a virtual racecourse, driven by Google Maps. Teams advanced along the race based on daily scores derived from their self-reported physical activity (pedometer steps and minutes of recreational exercise) and healthy eating (daily servings of fruits, vegetables, fibre, and water). Participants tracked their daily physical activity and healthy eating online within their personal account, which connected with the weight loss program in real-time. This allowed for immediate feedback to be displayed on the team racecourse after logging daily activities. Daily email tips and weekly educational content were also provided. In addition, participants attended weigh-ins at their local CFB gym every week to receive their 7-day supply of low-GI energy bars. The program instructed them to use the energy bars as a healthier snack alternative or as a meal replacement in conjunction with a fruit and/or vegetable and a glass of milk.

Results: Of the 1,506 military personnel who received an email invitation, 132 registered for the weight loss program. 67 participants created a team and completed the program's first week. 53 of these 67 active participants (76%) completed the 4-week program, while 49 (73%) continued the program for a second month when an optional extension was offered. Among active participants, the average change in weight over four weeks was -2.6lbs, ranging from +6lbs to -11lbs. Seventeen participants lost at least 5lbs and three participants lost at least 10lbs. There was also a significant dose-response relationship with use of the website. More frequent tracking of one's physical activity and healthy eating was positively associated with greater weight loss ($p=0.005$).

Conclusion: An online weight loss program was both feasible and successful over the short-term. This web-based approach requires long-term evaluation to determine if it can support healthy lifestyle changes and clinically important weight reduction.

2A01: The Single Military Parents – Family Well-being Study: Qualitative Results

Norris, D., PhD¹, Skomorovsky, A., PhD²

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Introduction: While previous research has addressed the challenges faced by single-parent civilian families and by dual-parent military families, the issues faced by single-parent military families in balancing the unique demands of a military career with parental responsibilities is understudied. Moreover, a review of the literature did not reveal studies emphasizing the re-

lationship between work-family balance in military single-parent families and well-being nor do any previous studies focus on coping strategies. The Single Military Parents – Family Well-Being Study was designed to address these gaps. The purpose of this study was to explore the relationship between military operational expectations and the well-being of single-parent families.

Methodology: Focus groups were conducted with 65 single military parents located at 4 military bases across the country. Of the number that provided demographic information on a short questionnaire, 11 were never-married, 50 were divorced, and 3 were widowed. The total participant group was balanced by gender, as 30 were male and 27 were female. Most owned their own homes ($n=45$), but some ($n=10$) lived in private married quarters (PMQ) housing while others rented their homes ($n=5$). Work-related separations of longer than 30 days ranged from 1 to 10 among the participating parents for all but one participant, who experienced more than 11 work-related separations from his or her children. Data were analyzed using MAXQDA, a qualitative data analysis software program. Open, axial, and selective codes were developed and analyzed.

Results: Coping was found to play an important role in the well-being of single parents. At the individual level, coping strategies are instrumental in maintaining work-family balance and enhancing well-being. These strategies include the implementation of organizational skills, multi-tasking, prioritizing, self-care (hobbies, exercising), maintaining a positive attitude, establishing boundaries, and compartmentalization. Participants recommended the use of proactive rather than reactive coping strategies. Furthermore, coping through social support seeking behavior was found to be an effective strategy. Specifically, getting support at Military Family Resource Centres (MFRCs) and asking for professional help (e.g. from medical professionals) were useful to some single parents.

Conclusion: This research contributes to a wider perspective on the impact of military life on single-parent military families. Findings from this exploratory study can serve as a foundation for future quantitative analysis of this understudied phenomenon. The analysis of individual, interactional, and institutional processes and practices implicated in the amelioration of the stresses ongoing in the lives of single-parent military members can inform future program and policy development.

2A02: Work-Family Conflict and Well-being among Single Parents in the CAF: The Role of Coping

Skomorovsky, A., PhD

Department of National Defence

Introduction: The demands of military life, including relocations, foreign residency, periodic family separation due to deployments, risk of injury or death of the military member, and long and unpredictable duty hours, can be particularly stressful for military families. The demands of military life may cause considerable work-family conflict, a serious source of stress in the families, especially among single-parent military families. No research has so far examined coping and wellbeing among single parents in the Canadian Armed Forces (CAF). The goals of the study reported here were to examine the impact of work-

family conflict on the well-being of single military parents and the moderating role of coping in the path between work–family conflict and parent wellbeing.

Methodology: A paper-based survey was mailed to the home addresses of single-parent Regular Force CAF members (who had children 19 years of age or younger and were single, divorced, separated, or widowed). Of 3,211 CAF single parents who received a link to the survey, 1,260 responded. The final sample comprised 552 single parents who completed at least 65% of the survey, yielding an adjusted response rate of 17.2%.

Results: A series of hierarchical regressions were performed to predict single-parent life satisfaction and wellbeing. Overall, work–family conflict was an important predictor of stress, reducing wellbeing and life satisfaction among single military parents. Coping also significantly predicted wellbeing. Avoidant coping uniquely and negatively predicted well-being and life satisfaction, whereas active coping uniquely and positively predicted wellbeing and life satisfaction, over and above the role of work–family conflict. Finally, avoidant coping increased the negative impact of work–family conflict on well-being and life satisfaction, whereas active coping buffered the negative impact of military-life stressors on the wellbeing of single military parents.

Conclusion: This research suggests that it is difficult to maintain work–family balance in single-parent military families and that work–family conflict constitutes a significant source of stress among such families, contributing to poorer well-being. However, the use of effective (i.e., active) coping strategies should be encouraged as they can serve as buffers for the stressors affecting single military parents.

2A03: Adolescent–Military Parent Relationship and Adolescent Well-being: The Moderating Role of Coping

Bullock, A., MA, Skomorovsky, A., PhD

Department of National Defence

Introduction: Two factors have been demonstrated to predict adolescents' psychological wellbeing. One is child–parent relationship quality. Adolescents with a secure child–parent relationship (i.e., close, supportive, involving mutual trust, quality communication) experience lower internalizing and externalizing problems and higher self-esteem than their counterparts with insecure child–parent relationships. The second factor is coping behaviour. Adolescents who engage in cognitive and emotional coping behaviours report higher wellbeing than adolescents who use maladaptive coping. No research has been conducted on the child–military-parent relationship, adolescent coping, and wellbeing in families of Canadian Armed Forces (CAF) personnel. The goals of this study were to examine (1) whether the child–military-parent relationship predicts adolescent wellbeing and (2) whether adolescents' coping behaviour moderates the association between the child–military-parent relationship and adolescents' wellbeing.

Methodology: A paper-based survey was mailed to the home addresses of a random sample of 3,000 adolescents (aged 14–19 years) from families of Regular Force CAF members. Responses were received from 208 adolescents. Of these, $N = 142$ adolescents (80 girls, 61 boys, 1 unidentified) and $\text{Mean}_{\text{age}} = 16.57$ years

($SD = 1.82$). Using a questionnaire, adolescents self-reported on the quality of the child–parent relationship (i.e., trust, communication, alienation), coping behaviour (cognitive, emotional, maladaptive), depression, anxiety, cognitive, emotional, and behavioural problems (aggregated to form an overall adjustment index), and self-esteem. All measures were chosen because they evinced strong psychometric properties.

Results: A series of hierarchical regressions were performed to predict adolescent wellbeing and adjustment (depression, anxiety, adjustment issues, self-esteem) from the child–parent relationship and coping. Overall, the child–parent relationship significantly predicted adolescent wellbeing. In particular, alienation uniquely and positively predicted depression, anxiety, adjustment issues, and negatively predicted self-esteem. Coping also significantly predicted wellbeing. Specifically, maladaptive coping uniquely and positively predicted depression, anxiety and adjustment issues, and uniquely and negatively predicted self-esteem. Self-esteem was also uniquely and positively predicted by cognitive and emotion coping. Finally, none of the interactions between alienation and maladaptive coping were significant in predicting depression, anxiety, adjustment issues, and self-esteem. Moreover, the interactions between alienation and cognitive coping as well as alienation and emotional coping in predicting self-esteem were not significant.

Conclusion: Findings from this research suggest that adolescents' wellbeing can be improved by reducing the amount of alienation in adolescents' relationships with their military parents and teaching adolescents cognitive and emotion coping strategies.

2A04: Role of Personal and Social Resources in Adjustment to Civilian Life and Well-being among CAF Veterans

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Introduction: Transition to civilian life can be a difficult experience for some individuals, particularly those with psychological or physical health issues. However, resources at the individual, social, and community level may help to ease adjustment. In particular, both mastery and social support have been shown to have protective effects during stressful events. It is important to understand these factors in order to accurately provide or enhance the programs and services to assist Veterans' transition. In the present study, the role of mastery and the social environment (i.e., satisfaction with social support, community belonging) in relation to physical and mental health conditions, life stress, and adjustment to civilian life, was examined.

Methodology: The Survey on Transition to Civilian Life (STCL), part of the Life After Service Studies (LASS) program of research, measured the health, disability and determinants of health of 3,154 former Regular Force members who released from the Canadian Armed Forces (CAF) between 1998 and 2007. The questionnaire was based mainly on the content of the Canadian Community Health Survey (CCHS), and was administered using the computer-assisted telephone interviewing (CATI) system. Two ordinal logistic regression analyses were conducted: one with the

health-related variables, including sex; and the second with mastery, social support, and community belonging. For both models, adjustment to civilian life was the dependent variable.

Results: It was found that the odds of an easier adjustment were lower for those who reported more life stress, and those who reported a physical or mental health condition. Once mastery and the social environment variables were added to the model, the odds ratios for life stress and health conditions increased closer to 1, indicating a mitigating effect of adding these variables to the model.

Conclusion: The results of this study point to the importance of personal characteristics and aspects of the social environment in the adjustment to civilian life among military Veterans. These findings are in line with those of previous studies, which have indicated the importance of psychosocial resources such as mastery, social support, and community belonging in protecting against the adverse effects of stress, and suggest the importance of psychosocial resources in the Veteran population. From the perspective of interventions and programs to help individuals cope with stressors such as the adjustment from military to civilian life, individual-level variables and support networks may be particularly important in easing transition, and could be developed and enhanced throughout the military career.

2A05: Emotion Regulation and Social Support's Link with PTSD and Depression in Veterans: Considerations for Adaptive and Maladaptive Coping

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University of British Columbia

Introduction: Difficulties in emotion regulation and social support have been linked to psychological distress in military, Veteran, and civilian samples. Emotion regulation difficulties have been consistently found to be a risk factor for psychological distress while social support a protective factor. For this presentation, we will present a study examining how emotion regulation difficulties and social support contribute to symptoms of depression and posttraumatic stress disorder (PTSD) in a sample of Canadian Veterans with a traumatic life event. We will also test if social support moderates the relation between emotion regulation difficulties and depressive and PTSD symptoms.

Methodology: Canadian military Veterans ($N = 100$) completed measures of emotion regulation difficulties (Difficulties in Emotion Regulation Scale), social support (Multidimensional Scale of Perceived Social Support), depression (Beck Depression Inventory), PTSD (PTSD Checklist-5), traumatic life events (Traumatic Life Events Questionnaire), and a demographics questionnaire. Veterans served mostly in the Army (63%), were male (89%), were married (58%), were deployed to a warzone (74%), and experienced military combat (51.7%). Using structural equation modelling, we will examine the direct effects of emotion regulation difficulties and social support on depressive and PTSD symptoms. Then, we will test if social support moderates the relation between emotion regulation difficulties and depressive and PTSD symptoms.

Results: Preliminary results indicate clear direct effects of emotion regulation difficulties and social support on depressive symptoms and PTSD symptoms. The moderating effects

of social support on the relation between emotion regulation difficulties and depressive symptoms and PTSD symptoms are complex and require further analysis to accurately interpret. All analyses will be completed by and presented at Forum.

Conclusion: Findings from our study indicate the importance of emotion regulation and social support on symptoms of depression and PTSD in Canadian Veterans. Further, they add to this literature by being the first to evaluate their complex interaction in a Veteran population. Implications for primary, secondary, and tertiary prevention efforts will be discussed in light of the findings.

2F05: Re-framing PTSD: The Consciousness-raising Potential of "Art-viewing" and Guided Gallery Visits for Traumatized Members and Veterans of the CAF

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Introduction: Adult educators have long found value in the pedagogy presented by Paulo Freire. When working specifically with marginalized groups, consciousness-raising tools such as codifications ("pictures...within which lie themes that change people's perceptions of life") often prove particularly effective (Burstow, 2006; Peckham, 2003). In recent years social scientists have also seen an increased interest in arts-based approaches to adult education and community-building, especially when working with populations going through difficult transitions in life (Potash, 2013; Rose, 2014). However, research in this area remains limited; as does the definition of "arts-based" approaches to working with participants. We are interested in broadening this conversation.

Methodology: Our current research seeks to do exactly this. Based on several case studies we have conducted at the Art Gallery of Ontario with military personnel seeking treatment for PTSD, we ask: "What are the benefits of using existing paintings (created by some of the world's best artists and hanging on the walls of galleries in many of the world's largest cities) as a starting point when working with traumatized service members and veterans? If introduced to the works by an educator who has basic knowledge of the paintings (the techniques being used, basic details about the artists' biographies etc.), will participants find ways to relate to the works? If so, how?"

Results: Our preliminary findings indicate that while traditional codifications often provide participants with rational approaches to understanding issues/injustices at hand, given the opportunity to participate in facilitated discussions about artworks in a gallery setting, Canadian Armed Forces (CAF) participants were able to connect on more visceral levels to the art being viewed. Many participants were immediately able to relate aspects of the paintings and sculptures to their own lives and seemed eager to connect aesthetic choices made by artists to their own traumatic memories and current difficulties they feel transitioning from military to civilian life. Active duty and veteran participants reacted particularly powerfully when introduced to works created by artists who themselves fought in or were deeply impacted by war (i.e. Francis Bacon, Henry Moore, Alex Colville).

Conclusion: These tours have provoked profound and often surprising reactions amongst participants –leading us to de-

termine that it is not only important to share our findings, but that the questions raised by our research to date deserve further exploration, including into how guided gallery visits with CAF participants and their family members might help foster communication and understanding

3B01: Operational Stress Injury and the Impact on the Mental Health and Well-being of Spouses of Veterans: A Scoping Review

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Introduction: The research reported in this paper is a component of a scoping review focusing on the impact of operational stress injuries (OSIs) on family mental health and well-being. Canadian and international peer-reviewed literature examining the impacts on spouses of combat and service Veterans was reviewed. The research, overall, and the environmental scan of programs and services available to family members of Veterans with OSIs, also undertaken as part of the larger project, reveals gaps within the literature and establishes a foundation for future research.

Methodology: The methodology developed by Levac, Colquhoun, and O'Brien (2010) guided the implementation of the review. Information pertaining to the purpose, methods, results, and implications of studies meeting the selection criteria was extracted and charted within an Excel spreadsheet. A descriptive/analytical process designed to identify and compare key themes within the charted information was employed.

Results: A total of 144 articles were reviewed, 18 of which focused on programs, services and clinical interventions and 5 were review articles. All other articles were reports of primary research and were mostly retrospective and cross-sectional. The country of origin of the research was varied, although most were related to the US OIF/OEF deployments. Four themes emerged from the analysis of the literature: 1) strong support for the negative impacts of OSIs on the relationships of spouses of Veterans; 2) intimate partner violence is a significant inter-spousal outcome of OSIs and is strongly associated with diminished relationship quality, 3) spouses are engaged in active and ongoing caregiving of the Veterans with OSIs; 4) OSIs may incite a chain reaction within the family resulting in secondary trauma for spouses, in particular.

Conclusion: The analysis of research focusing on the relationship between OSIs in Veterans and the mental health and well-being of spouses brings into view recommendations for future research. Understandings of the mechanisms mediating the relationship between OSIs and outcomes for spouses is required. Knowledge of bi-directional, reciprocal effects also warrants scrutiny as well as predisposing or enabling conditions. The body of research focusing on spousal relationships would benefit from more randomized control trial studies, longitudinal studies investigating life course transitions, and qualitative studies examining contextual factors that facilitate resilience and post-traumatic growth.

3B02: Operational Stress Injuries: Impact on Family Mental Health and Well-being

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Introduction: This study was part of a larger scoping review and environmental scan conducted for Veterans Affairs Canada on the effects of operational stress injuries (OSIs) on the mental health and well-being of Veterans' families. This paper focuses broadly on the relationships between combat (and/or deployment more generally), OSIs (primarily post-traumatic stress disorder (PTSD)), and the family. Based on the scoping review, the paper finds that existing research investigates the impacts of a Veteran's OSI on the family, but also how various aspects of the family (such as family functioning, family support, etc.) can impact a Veteran living with an OSI.

Methodology: The methodological framework for conducting scoping studies developed by Levac, Colquhoun, & O'Brien (2010) guided the implementation of this review. This framework is grounded in the model developed by Arksey and O'Malley (2005) and involves the implementation of a step-by-step process.

Results: The main themes that emerge from the analysis of the relevant literature are: (1) There is strong evidence for the negative effects of deployment, combat, and/or PTSD on family functioning and family well-being. (2) There is some evidence that family support (as an aspect of "social support") positively impacts the diagnosis and treatment of Veterans with PTSD, while family concerns can also negatively impact Veterans' mental health. (3) There are two important emerging areas of research interest: a) the bidirectional impact between OSIs and the family; and b) the functioning and well-being of the families of female Veterans living with the psychological effects of combat exposure and/or deployment.

Conclusion: OSIs create stressors for families and family functioning, but little is known about OSIs beyond PTSD as they interrelate with the family. In particular, more research is needed on the complex bidirectional impacts of OSIs on the family, as well as on family members other than spouses and children. Furthermore, a less rigid understanding of the family and an acknowledgement of non-traditional families would be important to consider. In addition to studying male Veterans and their families, more attention could be paid to non-traditional Veterans, such as female Veterans and their families. Finally, there is an urgent need for Canadian research on how the OSIs of Canadian Afghan war Veterans may be affecting the wellbeing of their families as well as how family life may be impacting the diagnosis and treatment of these Veterans.

3B03: A Scoping Review of the Impact of Parental Operational Stress Injury on Child and Youth Mental Health and Well-being

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Introduction: As part of a larger research project exploring the impact of Operational Stress Injury (OSI) on family health and

well-being, a scoping review was completed to identify the impact of parental OSI on children and youth growing up in families of a combat or service Veteran.

Methodology: Levac, Colquhoun, and O'Brien's (2010) refined scoping review process was used to structure this study. Twenty-one social and health sciences databases were searched with a broad and comprehensive search strategy to identify potential sources informing family health and well-being.

Results: 480 articles were screened for inclusion. 64 titles proceeded to full analytic data extraction. The majority of the studies were published after 2010. The sources were predominantly perspective pieces (e.g., editorials and discussion papers) and primarily American. Three themes emerged: 1) While one cannot presume the presence of pathology or resiliency among children in military families generally, parental OSI impacts children and youth through a complex interplay of factors; 2) Collaboration and innovation across sectors are critical to explicitly support children and youth in families dealing with parental OSI; and 3) Significant gaps are present in this body of literature, necessitating multi-faceted approaches to researching this vulnerable population.

Conclusion: Most of the research on children and youth in military families has historically focused on deployment, with little attention thus far on the impact of parental OSI. While there is developing evidence that parental OSI and caregiver mental health impact many aspects of child development, understanding the impact of parental OSI in childhood in terms of age, gender, school functioning, duration of exposure to parental OSI, military branch, caregiver mental health, resilience, and vulnerability to mental health issues, among others, requires longitudinal developmental cohort research. The evidence base that informs current programming for families is scarce, but there is emerging evidence that a family approach to assessment and intervention may be optimal. Evaluation of programs needs to examine their efficacy; satisfaction with the service provided is not a valid indicator of program effectiveness.

Public and professionals who interact with children in military families would benefit from professional development opportunities focusing on the particular vulnerabilities associated with this population.

3B04: An Environmental Scan of Programs and Services for Families of Veterans with Operational Stress Injuries

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Introduction: This paper reports on the results of an environmental scan (ES) of online resources available to families of Veterans with Operational Stress Injuries (OSIs). This research was a component of a scoping review focusing on the impact of OSIs on family mental health and well-being.

Methodology: Based on the methodology developed by Albright (2004), websites describing programs based in Canada, the United States, the United Kingdom, Australia, and New Zealand were retrieved. Websites were reviewed for information pertaining to programs/services for families of military service

and combat Veterans. The selection criteria for country of origin included complementarity of health care service delivery, socio-economic climate, national and international geopolitical positions, and combat and peacekeeping missions post-1990. Programs/services were selected if they focused on families of Veterans and on OSIs. A SWOT analysis (strengths, weaknesses, opportunities, and threats) was used to present the results.

Results: In total, 250 web pages were accessed, 28 journal articles were reviewed, and 66 programs/services meeting the selection criteria were analyzed. Overall, strengths of reviewed programs/services include: evidence of support from government and non-government organizations for a range of programs/services for Veteran families; MFRC involvement through provision of programs to families of members experiencing an OSI; and leadership evident in the development of innovative family-centred programs/services. Weaknesses identified include: geographic limits to access; minimal online availability; minimal access to information about clinical effectiveness of programs for families; and the lack of specialized programming focusing on OSIs alone. Opportunities identified from the ES include growing interest in collaboration with organizations supporting mental health care; the interest in integrating technology (e.g. apps) in practice modalities focused on the needs of families supporting Veterans with OSIs; and the lessons to be learned through further scrutiny of international exemplars. Finally, threats identified include: limited resources to address impacts of OSIs on family members and the lack of evidence-based research demonstrating the clinical effectiveness of programs and services.

Conclusion: Programs/services have been developed to target specific issues related to OSIs and their impacts on family mental health and well-being, however, these programs are often embedded in other services that may dilute the efficacy of OSI-focused intervention. Physical location has an impact on a family's ability to access programs and services, meaning that most do not have equitable access to potentially beneficial supports. Programs may be described, but higher standards of evaluation are required, along with evidence of the indicators of efficacy.

3E01: De la vie militaire à la vie civile – enjeux transitoires vécus par les anciens combattants

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Introduction: Les hommes et les femmes servant au sein des Forces armées canadiennes (FAC) arrivent tous un jour ou l'autre à la libération ou en d'autres termes à la retraite militaire. La transition de la vie militaire à la vie civile représente un moment important dans le parcours de vie des anciens combattants. Pour certains, la transition se fera en douceur et sans heurts. Tandis que pour d'autres, cette transition sera une période extrêmement difficile. La collecte et l'interprétation de données sur les enjeux transitoires permettent d'édifier un portrait moderne des besoins en matière de réinsertion des anciens combattants.

Méthodologie: Compte tenu du caractère exploratoire de la recherche, une approche qualitative comprenant des entretiens semi-dirigés d'environ 45 minutes chacune a été adoptée. L'entretien ait complété par une conversation libre d'un maxi-

mum de 10 minutes et par un court questionnaire sociodémographique. Un total de 17 anciens combattants ont participé à l'étude. Le recrutement a eu lieu par l'entremise de la Légion royale canadienne, de Vétérans UN-NATO et à l'aide de publicités sur les médias sociaux. Les participants parlent le français à la maison, habitent le Québec et ont été libérés des FAC depuis un maximum de 60 mois. Une analyse discursive a été développée pour interpréter les résultats obtenus.

Résultats: Les résultats préliminaires font état qu'il y a des différences significatives entre le processus transitoire d'un militaire libéré volontairement ou pour service terminé et celui qui est libéré pour des raisons de santé. La somme importante d'information diffusée et les nombreuses procédures administratives dans les dernières semaines de la carrière militaire ne facilitent pas la transition. L'arrimage entre les services du ministère de la Défense nationale et les services du ministère des Anciens combattants n'est pas automatique et représente une source de frustration.

Conclusion: En outre, la pertinence sociale de ce projet de recherche, qui interpelle tout particulièrement le service social, il peut aussi être applicable au domaine des sciences militaires, de la santé mentale et des politiques sociales. De plus, ce projet a la pertinence d'être applicable et de donner des pistes tangibles aux décideurs du ministère de la Défense nationale et du ministère des Anciens Combattants dans l'établissement ou la révision des programmes de soutien aux vétérans. Finalement, ce projet permet aux anciens combattants et aux futurs retraités des FAC de saisir les dynamiques possibles lors du passage de la vie militaire à la vie civile.

3F01: Financial Satisfaction and Well-being of CAF Personnel: The Protective Roles of Social Support and Coping

Berlinguette, M.K., MSc, Skomorovsky, A., PhD

Department of National Defence

Introduction: Previous research has consistently found the links between subjective material well-being and life satisfaction. Moreover, it is possible that personal characteristics and resources available make some individuals more resilient, buffering the negative impact of dissatisfaction with this area of life. Due to recent Canadian economic volatility, material well-being may play an important role in the overall well-being of military families. Nevertheless, the role of financial satisfaction in the overall well-being of Canadian Armed Forces (CAF) families has not been previously examined. In order to address this important research gap, this study was conducted to examine the role of financial satisfaction and personal resources in the overall well-being and life satisfaction of CAF members.

Methodology: Regular Force CAF members in three of the CAF bases (Cold Lake, Halifax, and Petawawa) completed an electronic survey (N = 1,265). Out of those who reported their demographic characteristics, there were 1112 (87.9%) male and 153 (12.1%) female; 121 (9.6%) Junior Officers, 52 (4.1%) Senior Officers, 791 (62.5%) Junior Non-Commissioned Members (NCMs), and 301 (23.8%) Senior NCMs; 350 (27.8%) – Navy, 540 (42.9%) – Army, and 370 (29.4%) – Air Force personnel.

Results: Hierarchical regression analyses were conducted to examine the role of financial satisfaction in the life satisfaction

and psychological distress of military members as well as the protective role of social support and ability to cope with daily demands. Financial satisfaction was found to positively predict life satisfaction (accounting for 40% of the variance) and negatively predict psychological distress (accounting for 10% of the variance). Moreover, both financial satisfaction and daily coping skills served as unique predictors of life satisfaction and psychological distress. Finally, one's ability to handle day-to-day stressors buffered the negative impact of financial well-being perceptions on general life satisfaction.

Conclusion: This research suggests that both financial satisfaction and perception of availability of social support are important and independent predictors of well-being among military members. Therefore, military families under financial stress should consider seeking financial counselling and utilizing various social support systems in combination to maximize positive outcomes. Furthermore, CAF members with more efficient coping strategies are more resilient to financial stress. While military members should be encouraged to adopt coping strategies to mitigate financial stress, further research is required to explore the specific strategies that are effective in buffering this type of stress.

4C01: Pilot Project: Community Development at a Canadian Military Family Resource Centre

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¹Queen's University; ²Kingston Military Family Resource Centre

Brief Description: A Canadian Military Family Resource Centre (MFRC), seeking to better understand and meet the needs of military families in Kingston, Ontario partnered with the Queen's University Occupational Therapy (OT) Program. OT students, who complete coursework and fieldwork in community development were engaged to participate in this process.

Six OT students completed 185 hours each of community development fieldwork at the MFRC. The students partnered with the MFRC from January to April, 2015. Regular meetings between the OT students, the MFRC staff and the university fieldwork coordinator took place during those 4 months. Student progress was tracked using the Community Development Progress and Evaluation Tool (CD-PET).

Clinical Outcomes: Feedback from the Kingston Military Family Resource Centre (KMFRC) staff relating to student engagement was positive. All students were evaluated by the CD-PET and successfully completed their placement. Students used an assets-based community development (ABCD) approach to focus on developing capacity in 3 areas:

1. Community engagement: supporting inter-connectedness for military families.
2. Community outreach: connecting military families to community resources.
3. Community education: raising community awareness of the unique needs of military families.

Students successfully implemented an assets-based approach with the KMFRC community, engaging multiple stakeholders over a 4-month period.

Patient Population: Military members and their families in the

Kingston, Ontario region.

Conclusion: This pilot project represents a new partnership for the Queen's University OT Program and the KMFRC. The CD placement improved capacity for the KMFRC to understand and meet the needs of the military families it serves, and engaged the broader community to support the unique needs of military families.

This partnership will continue, with plans for more OT students to complete CD fieldwork at the KMFRC in 2016.

4C02: A Sense of Belonging and Identity as Coping Strategies to Enhance Psychological Well-being in Military Families

Bernthal, E., Lt Col, PhD

United Kingdom Ministry of Defence

Introduction: Little empirical work has explored how aspects of British Army life impact on the parent left at home during military enforced separation and what coping strategies they use when they become lone parents.

Methodology: This was a sequential three phased iterative qualitative study with 31 parents from an Army garrison using focus groups and interviews. Phase One: Used focus groups with 24 parents, explored how Army life affected parents. During Phase Two, seven of these parents were interviewed to explore the themes identified in the previous stage in greater depth. Phase Three involved interviews with a further seven mothers.

Results: As lone parents, mothers developed a variety of coping strategies that were either problem or emotion-focused. They highlighted the need for flexibility and resilience. These included setting up social networks to provide support to each other, relying and developing trust of their neighbours for practical and psychological support to develop a sense of belonging. Mothers developed a need for an identity as a spouse within an Army family and referred to each other as an "Army wife" regardless if serving or not. Allegiance to the Army created divided loyalties. Families within a regiment had a greater sense of belonging and identity than those from a Corps. They sought help from a health professional more readily if they were undergoing military enforced separation.

Conclusion: Anxiety and fear experienced during military enforced separation challenged a mother's fundamental need for safety, belonging and resilience. Setting up social networks developed a sense of belonging and group identity that were important coping strategies to enhance emotional support and resilience. This enabled them to cope with the stresses of being a military family. Strengthening a sense of identity and attachment increased a sense of belonging which had a positive impact on their psychological wellbeing and resilience. An emotion-focused approach tended to predominate when the stressor needed to be endured, such as separation and loneliness during times of deployment. An increased emotional vulnerability intensified a need for reassurance and increased help seeking behaviour. This study has increased understanding of the importance of and how Army

families develop an identity and sense of belonging to boost resilience as a coping strategy.

4C03: We Stand on Guard: A Research Program in Support of the CAF Family in Newfoundland and Labrador

Wideman, G., PhD

Memorial University of Newfoundland

Brief Description: In November of 2013 in a Special Report to the Minister of National Defence, Ombudsman Pierre Daigle presented the findings of his comprehensive review of the state of Canadian military families. In his report, Daigle presented 17 recommendations primarily aimed at fixes internal to the Department of National Defence (DND) and Canadian Armed Forces (CAF). Recommendation 8, however, urges the CAF to pursue partnership opportunities with external agencies and organizations thereby enhancing overall support to military families. Central to that task, according to Daigle, is that the CAF develops a better understanding of the priorities and pressures of civilian providers, their organizations and agencies.

Clinical Outcomes: This presentation will report on a research program developed in response to that recommendation, facilitated by Memorial University of Newfoundland. More specifically it will detail the development and progress of a loosely structured research alliance of civilian and CAF providers of health and social services alongside researchers from a range of disciplines. The alliance will be aligned with the principles of community engaged scholarship and focus on the following strategic objectives:

- to build capacity to advance empirical research to provide a stronger evidence base for program development
- to activate and engage research relationships with stakeholders across sectors, academic disciplines, and organizations
- to mobilize knowledge for action by users and providers of services

Patient Population: The role of the alliance will be to establish a two way flow of information regarding ways in which research can enhance existing resources and address gaps related to the social health and wellbeing of active duty personnel, Veterans and their families in the province of Newfoundland and Labrador.

Conclusion: The culture of the military, and by extension its support units, necessarily operates in a climate of protocols and chain of command. Outside of this culture, service providers struggle to find ways to adapt their organizational objectives to meet the needs of military families. Toward that end the alliance will engender productive and relevant research partnerships as well as enhance dissemination and uptake by end users. This report will document the progress and lessons learned during the first four months of the program's development and describe the opportunities and challenges of advancing research through the engagement of stakeholders across sectors, disciplines, and organizational cultures.

4C04: Strongest Families Institute – Military Family Services: Working Together to Remove Barriers to Care

Lingley-Pottie, P., PhD^{1,2,3}, Mattie, P., MHK⁴, Stride, T., MSc⁴

¹Strongest Families Institute; ²The Izaak Walton Killam (IWK) Health Centre; ³Dalhousie University; ⁴Canadian Forces Morale and Welfare Services

Brief Description: Strongest Families Institute (SFI) is a not-for-profit organization committed to delivering evidence-based, distance services to families. SFI was designed to remove barriers to care by delivering services to families in the comfort and privacy of their home at convenient times (i.e., days, evenings, nights). Strongest Families programs for pediatric behavior, anxiety and night time bedwetting have been rigorously tested in randomized trials and shown to be effective. SFI programs are skill-based learning that is customized to meet the families' needs. Families receive written materials, skill demonstration videos (via handbooks or delivered by smart-website technology) and structured weekly telephone calls from a coach. Coach schedules are flexible to accommodate parents regardless of where they reside. With SFI services, barriers to care such as travel, missed time from school and stigma are virtually eliminated. Moreover, coaches help military families with planning for major transitions such as frequent relocations, deployment and reintegration back into the home. The SFI coach is a familiar, centralized support for the family, regardless of the move or deployment location.

SFI services results are strong with an 85% success rate in resolving pediatric problems, a strong impact on family functioning and on parental mood scores. The results of a pilot demonstration project funded by Military Family Services, involving three Military Family Resource Centres-MFRC (Saint John's, Newfoundland; Kingston, Ontario; and Halifax, Nova Scotia) will be presented.

Clinical Outcomes: SFI uses the Brief Child and Family Phone Interview as a primary outcome measure which includes a customer satisfaction scale. Weekly improvement ratings are reported and coaches update the problem-profile to show gains made. Outcomes are reported to the referring agent on an individual basis to help maintain the continuum of care after program completion. Funders receive aggregate outcome reports quarterly and annually. Program fidelity is evaluated through regular competency scoring of coaching calls.

Patient Population: The pilot population included twenty-five serving military families with children who presented with significant behavioural or anxiety challenges.

Conclusion: SFI can compliment existing services for military families by providing help when and where they need it. Families report high satisfaction with the distance mode of delivery. Helping families learn skills to cope with challenging transitions by building routines and using technology to maintain family connections can lead to positive outcomes for the child and family unit. National and International adoption of this cost-effective delivery system can improve the lives of military and veteran families.

4F01: Housing First - Ending Homelessness for Veterans

Richardson, J., MBA, Forchuk, C., PhD

Western University

Brief Description: Underlying processes that contribute to homelessness among Canadian Veterans are multifactorial and typically involve a combination of physical and/or mental health challenges, addiction and other psychosocial factors that interfere with successful transition to civilian life. Experiences such as operational stress injury and/or isolation from family compound these issues leading to increased vulnerability to a variety of social problems, including living in unstable/inadequate housing or experiencing absolute homelessness. A two year multi-site study examined the importance of key principles for addressing homelessness among Canadian Armed Forces (CAF) Veterans, including: Housing First, housing with support, peer support, provision of services separate from the general shelter/homeless population, promoting self-respect, providing structure and providing a transition process to housing while addressing co-occurring mental illness, addiction and trauma.

Local community organizations across 4 Canadian sites (Calgary, London, Toronto, Victoria) collaborated with federal partners including Human Resources and Skills Development Canada (HRSDC) and Veterans Affairs Canada (VAC) to provide housing with support to Veterans experiencing homelessness. A Practice Manual and a Peer Program Practice Guide were produced based on the evidence and front line experience of this collaboration.

This presentation will highlight relevant sections of the manual and guide. The Practice Manual offers promising practices for a Housing First approach for Veterans moving from homelessness to home. The Peer Program Practice Guide offers direction on how to develop and implement a successful peer program in a Housing First approach for Veterans moving from homelessness to home.

Clinical Outcomes: Quantitative findings (N=63) reveal a pattern of chronic homelessness occurring over many years following release from active service. Qualitative analysis validated key principles for addressing homelessness among Veterans and supported Housing First and Harm Reduction philosophies. A continued need for innovative strategies to engage Veterans in housing related services was evident with strong agreement in the value of peer support.

Patient Population: Veterans participants served a mean of 8.1 years (range 0.17-38 years, SD 8.8) with 39.7% reporting overseas deployments. Time since release from the CAF averaged 28.4 years (range 1-58 years, SD 13.6) with first episode of homelessness occurring 9.8 years ago (range 0-47, SD 10.5) and an average of 5.8 years, (SD 6.8) total time spent homeless.

Conclusion: Creative, flexible approaches that balance safety, security and structure while at the same time promoting self-respect, personal choice, harm reduction and autonomy are essential to providing meaningful service to this population. Establishing strong interagency partnerships and strengthening pathways that promote information sharing and collaborative case management across sectors are integral to improving housing stability and reducing the risk of homelessness among Veterans.

5C01: Exploring the Strengths of Children and Adolescents from Military Families to Promote Positive Development

Schwartz, K.D., PhD, RPsych, Stelnicki, A.M., MSc

University of Calgary

Introduction: Children and adolescents from military families are often confronted with experiences not faced by their civilian peers, including frequent moves and school-transitions, extended parental absence, and challenges related to parental return (e.g., OSIs, readjustment). While the existing literature is inconclusive regarding whether being part of a military family affects the social, emotional, or behavioural functioning of children, it is proposed that youth in military families self-report significant individual and social developmental assets that have heretofore been overlooked.

Rather than taking a deficit-based approach to development, *positive youth development* (PYD) represents a framework to explore how individual and social assets can act as protective factors to promote wellbeing and adaptive functioning. A strength-based approach, rather than focusing only on risks and vulnerabilities, has previously been shown to be empowering and effective for youth in many different contexts (Lerner, 2005). Of note, the developmental assets framework (Search Institute, 2005) focuses on positive socialization processes, including relationships, social experiences, social environments, and interactions, that contribute to healthy development.

Previous research has shown that a higher number of developmental assets are linked to significantly better wellbeing outcomes (Scales, 2011). The purpose of the present study was to identify what developmental assets (both individual and social) are present in youth of military families and how these self-reported developmental assets are related to risk (e.g., maladjustment behaviours) and thriving (e.g., adaptability and adjustment) for children in military families.

Methodology: Youth of military families (ages 11-18) completed the 58-item Developmental Assets Profile (Search Institute, 2005), and measures of their current behavioural, social, emotional, and academic functioning (e.g., school success, school confidence). One parent were also requested to complete a brief psychosocial measure related to this child/youth.

Results: Preliminary results will be presented.

Conclusion: Identification of the strengths possessed by children and adolescents of military families will better inform programming to develop the thriving capacities of this unique population. Further, developmental assets can inform a strength-based approach when these children do identify with maladjustment issues specific to growing up in a military family. Future studies will be discussed that will continue to explore the power and presence of developmental assets in military families.

5C03: Engaging Youth Impacted by a Parental Operational Stress Injury in the CAF: iSTEP Summer Camp

Hawryluk, H. RSW, PhD (Cand)^{1,2}, Popik, J. BA²

¹University of Calgary; ²Military Family Resource Centre (Edmonton)

Brief Description: The devastating consequences of operational stress injuries (OSI) on military families are emerging as a

complex reality within Canada. The literature has provided compelling evidence to support the need for interventions of service members with OSI's to include family members. However, there is limited knowledge of intervention programs available for youth living within the Canadian Armed Forces (CAF) culture.

The iSTEP (Individual Success Through Empowering Peers) program, initially designed out of the Edmonton Garrison Military Family Resources Centre in 2009, has been offered as peer based group for children wanting to learn effective ways to live with a parent with an OSI.

A pilot camp running the summer of 2015 has been designed primarily as a way to increase social support and reduce isolation many military families experience as a consequence of mental health issues such as post-traumatic stress disorder, anxiety, and depression. The theme of the camp "Making me the Best I can Be", celebrates how youth deserve support independent from their parent within the mental health treatment process. Through expressive arts therapy we approach four main topics in the camp: 1) Unique Families: Understanding OSI's; 2) Dealing with Difficult Feelings; 3) Handling Our Anger; and 4) Self Esteem.

Clinical Outcomes: The program is being evaluated through pre- and post-measures from youth participants. Youth evaluation is completed through video diary and online surveys. Key lessons learned from facilitating this pilot will be discussed and future practice implications for mental health professionals working within this unique population will be recommended.

Patient Population: The program is designed for current CAF military families or Veterans' families who have children or youth living with a parent who has an OSI. The camp in July was open to children ages 6-12 years of age.

Conclusion: Empowering youth within CAF families is essential to building stronger communities. The iSTEP summer camp aims at offering youth a message of hope to build peer relationships and life long strategies to ensure they can continue to thrive and grow into resilience. The goal is to express the first hand experiences of youth as a collaborative process between program facilitators and youth participants, in order to ensure programs developed in the future can better serve the needs of this unique population and encourage youth in our CAF communities to "Be the Best They Can Be!"

5C04: The Impact of Geographic Mobility on Access to Special Education Services across Canada

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¹Queen's University; ²Canadian Institute for Military and Veteran Health Research

Introduction: Geographic mobility may present unique academic challenges to children growing up in military families. Children must adapt to new teachers, curricula, Individual Education Plans (IEPs), and peer groups. Transitions into new school settings may be particularly challenging when the child has a disability such as Autism Spectrum Disorder (ASD). This is due, in part, to the fact that each province and territory across Canada has its own legislation, definitions, and policies regarding special education services. Thus, parents and children with disabil-

ities are forced to navigate complex special education systems while coping with the typical stressors of moving. While there is American research on the issue, the impacts of geographic mobility on access to special education services remains uncharted territory in Canada. This research seeks to address this gap within the literature by 1) exploring the impacts of geographic mobility on access to special education and 2) offering recommendations on how to better support military children who experience school transitions.

Methodology: Drawing from the traditions of critical theory and constructivism, the research will explore the barriers to navigating new special education systems and challenge the principles of educational equity and inclusivity that Canadian special education systems claim to embody. An inductive process will be used to explore the personal perceptions and experiences of military families who have had a child with ASD transition into a new special education system. Interpretation and analysis of themes and patterns will occur as they emerge from the data. Interviews will be conducted with 6 adult civilian caregiver parents who have children with special education needs in Kingston, Ontario.

Results: In-depth interviews with caregivers who have had a child transition into a new special education system will provide insight into the common challenges and barriers that are experienced throughout the transition process. Outcomes may include policy recommendations to make special education systems more accessible for families that transition to new schools. Furthermore, the study intends to contribute to the enhancement and/ or creation of military family support systems that are focused on children's academic success.

Conclusion: This research directly addresses the gap within the literature surrounding the impacts of geographic mobility on access to special education for children growing up in military families. Qualitative methods will provide in-depth insight into the barriers and challenges that this population experiences. Recommendations flowing from the research may inform parents and educators in supporting successful school transitions for children with ASD.

6A01: Addressing the Problem of Sexual Harassment and Sexual Assault in the CAF: Systemic Obstacles to Comprehensive Culture Change

English, A., PhD¹, Engen, R.C., PhD^{1,2}, Cookson-Hills, C., PhD¹

¹Queen's University; ²Royal Military College of Canada

Introduction: Sexual assault or sexual harassment perpetrated by one member of the Canadian Armed Forces (CAF) against another member not only adversely affects the physical and mental wellbeing of the targeted member, but also adversely affects the morale, cohesion and operational effectiveness of the members' units.

Justice Marie Deschamps' March 2015 report, "External Review into Sexual Misconduct and Sexual Harassment in the Canadian Armed Forces," states that sexual harassment and sexual assault are serious problems in the CAF and she argues that "comprehensive culture change" within the CAF is "key" to addressing these issues.

However, the culture change that the CAF has attempted in the past 25 years has met with limited success due to two main factors: 1) difficulties in overcoming systemic obstacles to culture change in the CAF, and 2) difficulties in dealing with an entrenched existing culture based on Canadian military historical experience. This presentation will address the first factor - systemic obstacles to culture change in the CAF.

Methodology: The two major CAF culture change initiatives over the past 25 years were largely unsuccessful due to a lack of understanding of the nature and the magnitude of the challenges in implementing such change. The specific reasons for the lack of success in these initiatives are analyzed using organizational behaviour concepts for culture change as articulated in a Canadian military context by Allan English in *Understanding Military Culture: A Canadian Perspective* (2004) as well as Donna Winslow's work on military culture and culture change that was funded by the CAF.

Results: Preliminary research suggests that there have been five main systemic obstacles to successful comprehensive culture change in the CAF: 1) lack of strategic direction throughout the change process, 2) high turnover of senior leaders during the change process, 3) underestimating and failing to plan for internal resistance to major change, 4) over-reliance on top-down change methods while excluding other effective methods, and 5) inability to change organizational values and assumptions.

Conclusion: In the past, successful CAF culture change has been impeded by a lack of awareness of the institutional obstacles to change. In order to avoid the obstacles that confounded their predecessors and to assist stakeholders in future culture change meet the challenges of addressing problems of sexual harassment and sexual assault in the CAF, this presentation will identify major obstacles to the required change and suggest ways to overcome them.

6A02: Addressing the Problem of Sexual Harassment and Sexual Assault in the CAF: The Canadian Invasion of Germany in 1945 as a Historical Case Study

Cookson-Hills, C., PhD¹, English, A., PhD¹, Engen, R.C., PhD^{1,2}

¹Queen's University; ²Royal Military College of Canada

Introduction. Justice Marie Deschamps' March 2015 report, "External Review into Sexual Misconduct and Sexual Harassment in the Canadian Armed Forces," states that sexual harassment and sexual assault are serious problem in the Canadian Armed Forces (CAF) and she argues that "comprehensive culture change" within the CAF is "key" to addressing these issues. A major obstacle to culture change in Canada's armed forces in the past has been the inability to change organizational values and assumptions in the attempts to influence members' behavior. This presentation will examine one historical attempt by the Canadian military to effect culture change through legal and disciplinary methods.

In the spring of 1945 the incidence of rape by Allied servicemen, including Canadian soldiers, against German women skyrocketed. In response, Canadian Army authorities began to aggressively prosecute and punish sexual offenders in its own ranks. Between April and June 1945, 56 courts martial were convened to deal with the sexual assault of German civilians by First Canadian Army servicemen. In May 1945, charges of a sexual nature

made up one-fifth of the total courts martial that month.

Methodology. This paper is based on a historical analysis of Canadian courts martial files from the Second World War to examine the effects of using the military justice system to effect culture change through legal and disciplinary methods. Courts martial indices are used to compile statistical data about sexually violent charges, including the location, punishments, and units of the accused soldiers, as well as rudimentary information about their victims. Documentary analysis of relevant courts martial transcripts and surrounding archival documentation supplement these statistics. Theoretical and historical frameworks on military culture will be drawn from Paul Jackson and Chris Madsen, as well as Allan English's *Understanding Military Culture: A Canadian Perspective* (2004).

Results. Preliminary results suggest that the aggressive use of the Canadian military justice system in prosecuting cases of sexual violence in Germany had the desired effect of reducing the incidence of these acts. The high incidence of rape/sexual assault charges and convictions indicate that a coordinated institutional response to a problem of military culture can be effective.

Conclusion. This historical case study provides stakeholders charged with addressing the problems of sexual harassment and sexual assault in the CAF today with evidence that the aggressive use of the military justice system in prosecuting cases of sexual violence may effect desired changes in members' behavior and organizational culture.

6D01: Santé sociale et le bien-être du personnel militaire actif, des vétérans ou de leurs proches

Imbeault, M., PhD

Collège militaire royal de Saint-Jean

Introduction: La résilience psychologique est la somme des processus psychodynamiques qui permettent à un individu confronté à l'adversité, de conserver ou de retrouver son niveau de bien-être et de fonctionnalité antérieur. Dans le contexte militaire, on peut tenter de mesurer les facteurs positifs et négatifs qui influencent cette dynamique et faire des recommandations de différents ordres, par exemple sur la manière de préparer les militaires aux déploiements. Nous avons discuté l'an dernier dans ce Forum la construction d'une « forteresse intérieure » inspirée de la philosophie stoïcienne. Nous voudrions maintenant comparer ce processus au développement de la résilience afin de compléter notre recherche en la rattachant à la psychologie contemporaine.

Méthodologie: J'analyserai et commenterai des textes classiques de la philosophie stoïcienne, en particulier les *Lettres à Lucilius* de Sénèque, le *Manuel* d'Épictète et les *Pensées* de Marc-Aurèle, ainsi que des articles publiés récemment sur la résilience dans des revues spécialisées comme le *Journal of Occupational Health Psychology* ou les rapports commandé par RDDC depuis quelques années.

Résultats: Une première revue de la littérature sur le développement de la résilience dans la profession des armes montre une ressemblance avec la construction d'une forteresse intérieure. L'enjeu est, dans les deux cas, le maintien de l'équilibre psychologique malgré tout ce qui peut survenir et qui ne dépend pas

de nous. Dans le cas des militaires, on pense surtout à ce qui peut arriver lors de déploiements. Il y a toutefois aussi des différences. Elles sont importantes au plan philosophique. D'abord, l'enseignement du stoïcisme porte essentiellement sur les jugements que nous portons sur ce qui nous arrive. Mais c'est sur la question de la valeur de la vie que les deux approches diffèrent le plus radicalement. Le stoïcisme accepte, en effet, l'idée que le suicide puisse être un acte légitime, mettant ainsi une limite à la résilience. C'est pourquoi je voudrais discuter plus en détails les principaux motifs qui peuvent justifier cet acte selon les stoïciens, à savoir : 1. l'assujettissement à autrui; 2. l'assujettissement de l'homme à ses propres vices; 3. le dénuement matériel total; 4. la dégradation de la vieillesse; 5. la maladie.

Conclusion: Si la construction d'une « forteresse intérieure » correspond jusqu'à un certain point au développement de la résilience, leurs présupposés sont différents. L'analyse montre que la recherche légitime du bonheur s'accompagne chez les stoïciens d'une indifférence profonde par rapport à la vie et à la mort.

6D02: How is the Well-being of Officer Cadets Affected by their Expectations?

Bérubé, N., PhD

Royal Military College of Canada

Introduction: Management research has shown that expectations about outcomes and processes in work tasks are related to motivation and general feelings of well-being. However, research studies have not focused on the expectations officer cadets form at the start of their military career. This study focuses on the relationship between these and the well-being of officer cadets as they go through their years at the Royal Military College of Canada (RMCC).

Methods: In-depth, semi-structured interviews were conducted with a sample of 22 officer cadets. The interviews were structured to enable the researcher to probe some issues in greater depth and to follow emergent disclosures that appeared important to the participant. A thematic analysis was conducted to understand how respondents adapted to their life at the RMCC and how their expectations and future projections influenced their well-being throughout their years at the College. An inductive analytical approach was used to allow emergence of various perspectives based on the insights of three analysts with different but related backgrounds (Officer Cadet, Officer and Professor at RMCC). Based on the results, a quantitative survey was designed to administer to a broader sample.

Results: The analysis of the results revealed varied expectations and projections about future success in the Canadian Armed Forces (CAF). Negative experiences were related to feelings of marginalisation and frustrations based on biases and assumptions about the knowledge of officer cadets to carry out their tasks. Feelings of stress were related to perceptions of poor synergy between military and academic demands at key times, such as the exam period. A military identity was clearly helpful for integration and helped maintain well-being. The ability to plan, social contagion and insecurities about the realities of their future work as officers emerged as possible moderators of the relationship between these expectations and well-being.

Respondents also identified key points in their journey as officer cadets that altered their expectations and perceptions about their readiness to serve after receiving their commissions. Positive outcomes were generally attributed to the support of peers and key military or academic personnel.

Conclusions: Understanding key factors that affect the well-being of officer cadets is important to ensure that they will become effective officers in the CAF. The presentation will discuss findings of this study and perspectives for future research.

Poster Presentations

P120: Bugs and Plugs: Considerations for the Uptake of Personal Protection Measures among CAF Personnel

McCuaig Edge, H., PhD, Augustincic Polec, L., MD, Silins, S., PhD, Lee, J.E.C., PhD, Schofield, S., PhD, Banta, G., MD, Lamontagne, P., MWO Sibbald, J., BHSc, Born, J.A., MSc

Department of National Defence

Introduction: During operations and in-garrison activities, Canadian Armed Forces (CAF) members may be exposed to arthropod-associated diseases (AAD) such as Lyme disease, and malaria. Similarly, through occupation activities, they can be exposed to loud noises (e.g., small arms fire, aircraft, blasts) that can cause noise-induced hearing loss (NIHL). The use of personal protection measures (PPMs) to protect against these potential threats is a key strategy for protecting CAF personnel. To better understand why members use or don't use these interventions, we explored CAF members' beliefs and perceptions of the risk of AAD and NIHL, and the use of PPM prevention strategies.

Methodology: Semi-structured interviews were conducted with 15 CAF senior and frontline leaders (i.e., Officers, MWO/WO, or Sgt/MCpl), and 35 junior-ranked soldiers (Recruit/Pte/Cpl) at four CAF bases. Participants were drawn from various trades, and were selected based on deployment history, experience, and availability to be interviewed. The questions assessed risk perceptions about AAD and NIHL, and examined beliefs about using PPMs to prevent AAD (i.e., using insect repellent, bed nets, or permethrin-treated operational clothing), and NIHL (e.g., ear-plugs or earmuffs). Interviews were audio-recorded, transcribed, and subjected to a thematic analysis to identify factors that may be used to target prevention efforts.

Results: Preliminary results suggest that both AADs and NIHL were perceived as a greater health concern to CAF members than to Canadians generally. Specifically, respondents indicated that CAF activities, such as deployments to areas where AADs are prevalent, or being exposed to noisy military machinery, blasts, or weapon fire, increased the risk for AAD and NIHL, respectively. Respondents also believed that in general, the CAF provides measures and resources to protect against AADs and NIHL, though issues such as consistent supply, comfort, and convenience arose as potential barriers to use of PPMs.

Conclusion: Our findings suggest that participants perceived AADs and NIHL as health problems in the CAF. The leaders in this study indicated that the health and safety of their subordinates is of utmost importance, and use of PPMs is encouraged if not enforced at times when they are at risk of AADs or NIHL. Yet,

leaders also generally perceived that the individual soldier was largely responsible for protecting him/herself after having been provided with PPMs.

P121: Programs for U.S. Military Service Members and their Families: The Current Evidence

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Introduction: The Clearinghouse for Military Family Readiness (Clearinghouse) at the Pennsylvania State University is an applied research center focusing on the dissemination of the evidence-base for programs utilized to enhance the well-being of children, youth, and families. Over 900 programs have been vetted by the Clearinghouse and placed on the Continuum of Evidence. The Clearinghouse uses a rigorous, systematic process to review and categorize programs. Several factors are considered during the review, including ensuring that the program results in its desired outcome and has a lasting effect on its target population. Although all of the programs reviewed may be utilized for Military Families, several programs reviewed have been implemented, utilized, or researched with Military Service Members and their families. The evidence-base for these military specific programs will be discussed, along with their placement on the Continuum of Evidence, gaps in programming, and specific program topics.

Methodology: Evaluations published in peer-reviewed journals were vetted using five main criteria: (1) Significant Effects - rigorous statistical evidence, (2) Sustained Effects, (3) Successful External Replication, (4) Study Design, and (5) Additional Criteria, including representative sample, attrition, practical significance, and adequate outcome measurement. Each evaluation of a program is reviewed using the above criteria and the program, based on the evidence, is placed on the Continuum of Evidence. The program can be placed as either, (1) Effective-RCT, (2) Effective-Quasi, (3) Promising, (4) Unclear Plus (potentially promising features), (5) Unclear with mixed results/no evaluations, (6) Unclear Minus (potentially ineffective features), or (7) Ineffective.

Results: A total of 124 programs have been vetted and placed on the Continuum of Evidence which have been implemented and/or used by the U.S. Military, Service Members, Veterans, and their family members. Programs vetted have been utilized by the U.S. Air Force (N=16), U.S. Army (N=24), U.S. Marine Corps (N=10), U.S. Navy (N=16), National Guard/Reserves (N=16), Department of Defense wide (N=55), and with Veteran populations (N=11). Programs have been placed on the Continuum of Evidence in the categories of Effective-RCT (N=1), Promising (N=14), Unclear Plus (N=29), Unclear Mixed (N=10), Unclear No Evaluations (N=68), and Unclear Minus (N=2).

Conclusion: Based on the current evidence of programs implemented and utilized by the U.S. Military for Military Families we will highlight the topic areas where programming strengths exist in order to inform practice and policy. In addition, gaps in programming for U.S. Military Families will be identified to suggest possible areas of research and programming need.

P122: How Children Respond to OSI: Social, Emotional and Behavioural Outcomes in Children of Military Parents

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University of Calgary

Introduction: Military families experience unique and significant life events not experienced by typical families, including frequent moves, parental absence, reintegration, and operational stress injuries (OSI) in returning members. The effects experienced by children and adolescents of Canadian military parents has been largely ignored in the empirical literature. Further, very little research has been conducted in the past decade examining the impact of OSI or distress symptoms in returning members on their school-age children. Some support for increased externalizing problems (e.g., attention, behavioural problems) and internalizing (e.g., depression, anxiety), although results have been variable. Further, it is notable that none of the extant literature explores the effect of OSI on Canadian military families and their children. The purpose of this study is to explore these effects with children of Canadian military families.

Methodology: Military families were deemed eligible if they had at least one child between the ages of 5 and 18 living in the home. Parents completed questionnaires regarding their trauma and stress exposure, current levels of distress, mental health symptomology, military status, deployment history, and family demographic information. Parents also completed a rating scale of their child's social, emotional, and behavioural functioning. Children over the age of 8 also completed questionnaires regarding their own social, emotional, and behavioural functioning.

Results: Preliminary results will be presented.

Conclusion: Further research is needed to ensure military children are supported in coping when their parent presents with an operational stress injury, which may effect their parenting capacity. The results of this study instigates several important questions to address in future research, including: what social and familial characteristics might act as protective factors for children and adolescents who live with a Canadian military parent who has an OSI?

P123: Amputees Helping Amputees – The Legacy Continues

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The War Amps

Brief Description: During Forum 2014, The War Amps presented the first part of the journey to providing assistance to Canada's amputee veterans and serving personnel. The world of prosthetics and amputation is vast and complex, often a mystery to the general population. Since 2012, The War Amps has been collaborating with the Canadian Forces Health Services Group and Veterans Affairs Canada to provide training, information and support to staff involved in policy development and service delivery to amputee veterans.

Clinical Outcomes: Training sessions are delivered to the staff at the Integrated Personnel Support Centres and Veterans Affairs Canada Regional and District Offices across the country, increasing the knowledge and understanding that the needs

of the amputee are complex throughout their life course and require frequent interaction and assessment from the time of injury to the end of life.

During the training sessions attendees become familiar with prosthetics and amputation terminology and real live examples. Amputee veterans and serving personnel often participate in these sessions. Each session is unique and participants report that they are the most valuable in-service training session they have attended. Making the personal connections and receiving the "hands-on" training is key to delivering excellent care to those who have lost limbs through service to their country.

Patient Population: Canada's amputee veterans and serving personnel rely on a vast number of individuals with varied backgrounds to provide them with the supports, services and benefits needed to fully engage in civilian life, or to remain in the Canadian Armed Forces.

Conclusion: Lessons learned from all stakeholders have informed and led to significant policy and service delivery improvements. From "red-tape cutting" initiatives, to amputee empowerment, the successes are exciting to explore and expand upon.

4. Occupational Health

Podium Presentations

1D01: Surveillance of Mortality and Cancer Morbidity in the CAF: A Life-Course Approach

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Department of National Defence

Introduction: The Canadian Forces Cancer and Mortality Study II (CF CAMS II) is a 40-year longitudinal cohort study of cause of death and cancer morbidity occurring within all Regular Force personnel. To our knowledge, this is the first occupational record linkage study that describes the mortality and cancer morbidity experience of a full military cohort and provides the only currently appropriate method for conducting true life-course surveillance of still-serving and released Canadian Armed Forces (CAF) Regular Force personnel.

Methodology: Using pay records, a cohort of all Regular Force personnel who enrolled in CAF between 1976 and 2015 will be created. This cohort file will include individuals who are still serving, as well as those released from the CAF. It will also include (but not be limited to) explanatory variables such as locations; duration and frequency of deployments; education level; types and length of time within different occupations; rank history; and length of time since release (if applicable). This cohort will then be deterministically linked to the Canadian Cancer Registry (for cancer morbidity) and to the Canadian Cancer Mortality Database (for mortality).

Results: These linked data will be used to describe the mortality and cancer experience of CAF personnel over time. They will also allow us to conduct in-depth retrospective surveillance of suspected adverse health outcomes related to specific deployments (e.g. conducting a follow-up of the Gulf War Veter-

ans study or investigating mental health outcomes of Rwanda Veterans) as well as conduct surveillance into potential health concerns pertaining to specific occupational groups, deployments or other military career factors. These data will also allow the Department of National Defence to respond to any question on adverse health outcomes that may have happened the life course of any and all CAF personnel, both still serving and released.

Conclusion: The CF CAMS II data will allow the CAF to quantify the burden of mortality and cancer morbidity over a 40-year period. While current surveillance and health data systems within CAF are only pertinent either during periods of deployment or during the tenure of someone's career (e.g. CF Health Information System (CFHIS), CF CAMS II has the ability to look at adverse health outcomes both in parallel with the aforementioned systems, but also has the ability to describe cancer incidence and cause-specific mortality: 1) pre- and post-deployment, 2) before CFHIS became operational, 3) after release from Regular Force service.

1D02: Patterns of Occupational and Non-occupational Trauma Exposure in Canadian Military Personnel

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Canadian Forces Health Services Group

Background: Military personnel experience occupational and non-occupational trauma, both of which may contribute to mental disorders. Understanding the relative contribution of each obviously requires categorization of traumas as occupational or non-occupational. The traumatic experiences in the lifetime trauma inventory used in most large-scale mental health surveys (the Composite International Diagnostic Interview, (CIDI)) have usually been grouped conceptually. However, these groupings reflect a mixture of what could be occupational and non-occupational experiences for military members. For example, having been in a serious accident might occur in both occupational and non-occupational contexts for military personnel. The present study used an empirical approach to differentiate between military occupational and non-occupational traumatic events, and explored dose-response relationships between occupational and non-occupational trauma in military personnel.

Method: Using data from the 2013 Canadian Forces Mental Health Survey (n = 6700, response rate 80%), the 28 lifetime traumatic events in the post-traumatic stress disorder (PTSD) module of the CIDI were subjected to exploratory factor analysis. In addition, differences in the prevalence rates of the events in respondents with and without past deployments were explored. Finally, logistic regression assessed the dose-response relationship between numbers of traumatic experiences and mental disorders.

Results: Exploratory factor analysis extracted one clear military occupational factor, along with 4 non-occupational factors (sexual trauma, childhood non-sexual trauma, adult interpersonal trauma, and civilian exposure to war), accounting for 85% of the variance. Three experiences (participation in combat, serving as a peacekeeper, and exposure to atrocities) loaded decisively on the military occupational factor and 13 on one or more of the

non-occupational factors. A single item (having been a refugee) was excluded on the basis of sampling inadequacy; this was categorized as a civilian experience on conceptual grounds. The remaining items cross-loaded, and they occurred at significant prevalence rates in those with and without previous deployments. These equivocal items consisted of experiences known to occur in both occupational and non-occupational military contexts. Occupational and non-occupational trauma exposure were correlated. Total lifetime trauma and the three trauma subtypes showed consistent dose-response relationships with past-year and lifetime mental disorders.

Conclusion: Some experiences in trauma inventories may occur in both occupational and non-occupational contexts, and occupational trauma exposure is correlated with non-occupational trauma exposure. All trauma subtypes had cumulative relationships with mental disorders. Different approaches to dealing with the equivocal items in analysis of the effects of occupational and non-occupational trauma will be discussed.

1D03: Preparedness Perception with Short Notice Deployment to the Ebola Treatment Unit, Kerry Town, Sierra Leone on Operation Sirona, Roto 0 and 1

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Introduction: The Canadian Armed Forces often deploys on short notice to adverse environments. Operation Sirona augments the United Kingdom (UK) Operation Gritrock at the Ebola Treatment Unit (ETU) in Kerry Town, Sierra Leone. Personnel are staged at Canadian Forces Base, Petawawa with only days' notice for initial training followed by 9 days intensive mission specific training at the Army Medical Services Training Centre in Strensall, UK. Study surveys are administered on the first and last days of training to determine perceptions of baseline preparedness and effectiveness of focused intense training.

Methods: Questions included: information quality, informed expectations, clinical competency and confidence to deliver care in personal protective equipment (PPE). Responses are on a scale of 1 to 10 (1=worst, 10=best). We compare responses within group (Roto 0 and Roto1) pre and post training. The mean pre and post training responses were analyzed by matched paired t-test.

Results: Roto0: 39 respondents: 17/39(44%) female and 22/39(56%) male. Mean age (years): females 32, males 34. Mean service years: females 7.7, males 12.9. Previous operational experience: females 6/17(35%), males 15/39(68%). Mean days' notice: 15.5 (Range 1 to 28). Mean response scores pre and post training: (1) Information quality: 7.21 SD 1.72 and 7.92 SD 1.42; P=0.029. (2) Informed of expectations: 6.38 SD 2.40 and 7.82 SD 1.60; P=0.003. (3) Clinical competence: 7.44 SD 1.44 and 8.0 SD 1.61; P=0.536. (4) Confidence with PPE: 7.16 SD 1.90 and 8.6 SD 1.12; P=0.020. **Roto1:** 29 respondents: 15/29(52%) female, 14/29(48%) male. Mean age in years: females 31, males 34. Mean service years: females 9.5, males 9.8. Previous operational experience: females 4/15 (26%), males 9/29(64%). Mean

days' notice: 26.2 (Range: 1 to 55). Mean response score pre and post training: (1) Information quality: 8.22 SD 1.28 and 8.93 SD 0.99; $P=0.023$. (2) Informed of expectations: 6.59 SD 2.08 and 8.62 SD 1.29; $P<0.0001$. (3) Clinical competence: 7.15 SD 1.56 and 8.44 SD 1.05; $P=0.0001$. (4) Confidence with PPE: 7.5 SD 2.15 and 9.04 SD 0.84; $P=0.0009$.

Conclusions: Despite short notice to deployment and focused mission specific training, both Rotos were well informed and prepared for deployment. However, Roto 0 did not perceive an improvement in clinical competence post training, $P=0.536$. Higher pre and post training scores in Roto 1 are likely associated with longer notice for deployment and better understanding of the mission.

1D04: Characterizing the Relationship between Tick Bites and Lyme Disease in Active Component U.S. Armed Forces in the Eastern United States

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Introduction: Lyme disease (LD) is the most commonly diagnosed vector borne illness in the U.S. In a military context, the movement of service members throughout large training areas and between installations makes it improbable that conventional tick drag surveillance will be conducted in all the potential areas where exposure may occur. Furthermore, military-specific occupational tasks (which may involve increased time spent outdoors and in close proximity to wooded and grassy areas) may increase the risk of tick exposure in ways not captured by conventional tick-drag models. Analyzing ticks that are removed from patients (rather than collected via tick-drags) may improve LD surveillance because these ticks are known to be feeding on humans.

Methodology: This was an ecological study. Annual LD rates among active-component U.S. Armed Forces in the Eastern United States were compared with species-specific tick data from the United States Army Public Health Command (USAPHC) Human Tick Test Kit Program (HTTKP) covering the same geographic region. Simple linear regressions with adjustment for repeated measures sampling were conducted for all relationships of interest using 2-tailed Pearson correlation coefficients.

Results: The mean annual LD incidence was 52.2 per 100,000 person-years (95% CI ± 7.6 / 100,000) over a surveillance period of 1 January 2006 to 31 December 2012. A 10% increase in the rate of ticks submitted to the HTTKP corresponded to an increase in LD incidence of 5.7% ($p<0.01$). Where *Borrelia burgdorferi* infection of *Ixodes scapularis* ticks was high ($\geq 20\%$ tick infection prevalence), tick removal rates explained 53.7% of the annual variation in LD incidence ($p=0.01$).

Conclusion: The study supports using location-specific data from ticks removed while feeding on active-component service members to complement LD surveillance. Tick submission rates are better able to account for annual variation in disease where the baseline risk of LD acquisition is greatest. The strong association demonstrated between tick bites and LD incidence, inde-

pendent of tick species, suggests that there may be uncertainty in a provider's perceived ability to correctly identify the species of ticks found biting their patients.

1D05: A Comparison of Metrics for Impulse Noise Exposure

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Defence Research and Development Canada

Introduction: The recently approved MIL-STD 1474E includes two metrics for impulse noise exposure: The Auditory Hazard Assessment Algorithm for Humans (AHAH) and the equal energy model, which is equivalent to the total energy of the impulse calculated for 100 ms ($L_{Aeq100ms}$). The equal energy model is a variation of eight-hour equivalent energy metric (L_{Aeq8}) that has been widely evaluated and compared with the AHAH. While it is generally agreed internationally that all of the metrics have room for improvement, there has been much debate over which one is the best predictor of noise-induced hearing loss for weapon use. The analysis presented here is intended to provide evidence to support the recommendation of an impulse noise metric for the Canadian Armed Forces (CAF).

Methodology: Pressure-time signals were recorded for several different CAF small arms (hand-held weapons), suppressed and unsuppressed, at various shooter and observer positions on an open-field shooting range. The recordings are being analyzed using the AHAH and equal energy metrics to estimate the allowable number of exposures (ANE) that a shooter or observer could be exposed to without hearing damage. The ANE will be adjusted to account for the wearing of hearing protection based on earlier measurements of impulse peak insertion loss (IPIL) for various devices.

Results: Weapon noise signals with peak levels ranging from 140 to 177 dB are being analyzed. The interim results show that the ANE calculated using the AHAH and the L_{Aeq8} are in the same range for unprotected exposures. Analyses using the $L_{Aeq100ms}$ and protected exposures are in progress.

Conclusion: Recommendations resulting from the current analysis will apply to small arms fired in an open field range environment. More general recommendations for an impulse noise metric should be based on its ability to handle different types of impulses and environments (small and large calibre weapons, blasts, enclosed areas), to combine exposures from other noise sources (e.g., vehicle noise) and to include the effects of ever-changing hearing protection technology.

1D06: Hearing Loss Prevention Program

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¹Canadian Forces Health Services Group

Brief Description: "Ear disorders, e.g. tinnitus, hearing loss are the second most frequent medical conditions accepted for disability pensions or awards." – Veteran Affairs Canada, 2010.

Hearing loss awards (April 1, 2012 to March 31, 2014) – In the two years examined by CBC News, Veteran Affairs Canada paid out approximately \$145 million in lump sum payments to Canadians. – CBC News, 16 Sep 2014.

The Hearing Loss Prevention Program (HLPP) was launched in 2012 at 12 Canadian Forces Health Services Group (CF H Svcs

Gp) Wainwright Garrison based in Alberta. The HLPP aims to promote operational effectiveness and conserve manpower resources by mitigating the harmful effects of hazardous noise exposure to Canadian Armed Forces (CAF) personnel. A main component of this program is to identify soldiers susceptible to or at risk of noise-induced hearing loss (NIHL) and ensure soldiers receive an annual audiogram and counselling to prevent further hearing loss. Now in its third year running, it continues to raise awareness and education among military members at risk for NIHL.

Clinical Outcomes: Annual audiogram results (early indicator of hearing loss) are used as a health surveillance tool to monitor the hearing health of soldiers. These results were also used to promote situational awareness to Chains of Command regarding hearing loss among their troops and to encourage prevention efforts to mitigate the risks of NIHL.

Limitations: Annual audiogram data results cannot be established as a baseline against which future years' data can be compared for assessment of standard threshold shift (STS) trends as prevention performance indicators. The reasons for this are due to the ever changing demographic population at Garrison Wainwright, i.e., annual in/out postings, releases etc. of military personnel would render results inaccurate as it relates to prevention performance.

Patient Population: Wainwright CAF members in occupations considered to be "at risk" for noise-induced hearing loss.

Conclusion: Audiogram data results % breakdown of Standard Threshold Shift per organization is as follows:

- 3rd Canadian Division Support Base (3 CDSB) 15% STS;
- 3rd Canadian Division Training Centre (3 Cdn Div TC) 20% STS;
- Canadian Manoeuvre Training Centre (CMTC) 20% STS

Recommendations: Annual audiometric testing and worker education should continue for all troops as per the guidelines under the HLPP; and the Chain of Command needs to assist and support requests for hearing protection devices (at no cost to the soldier).

2C04: The Relationship between Insomnia and Disability in Workers with Delayed Recovery from mTBI

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Introductions: The relationship between insomnia and disability in persons with mild traumatic brain injury (mTBI) is not known. The principal aim of this study was to examine the independent effect of insomnia on perceived disability among workers with delayed recovery from mTBI.

Methodology: In this cross-sectional study, data from questionnaires, insurer records, and clinical investigations was analyzed. The *insomnia severity index* measured the primary independent variable and the *Sheehan disability scale*, with its work, social, and family life domains, measured perceived disability

outcomes, classified as "mild/moderate" or "marked/extreme". Two-sided t-tests and chi-square tests were utilized for bivariate associations. A binomial logistic regression model was fit using previously identified variables.

Results: The sample comprised of 92 workers with mTBI (45.1 ± 9.9 years of age; 61% male; 196 days post-injury). When compared to workers reporting lower disability, those reporting higher disability also reported more severe insomnia, depression, anxiety, and pain ($p < 0.001$). In the multivariable analysis, the odds of reporting higher global disability increased with increasing insomnia and pain (adjusted OR 1.16 (95% CI 1.03-1.31) and 1.117 (95% CI 1.01-1.24), respectively). There were no other significant covariates. In a fully adjusted work disability model, insomnia was the only significant covariate. None of the variables studied were significant in the social and family life disability models.

Conclusion: Our results highlight insomnia as a disabling factor, independent of age, sex, time since injury, pain, anxiety, and depression. These findings point to the importance of assessing and targeting sleep problems to improve self-perceived global and work-related outcomes in persons with delayed recovery from mTBI.

2F03: Using Evidence to Inform Health Protection Policy and Deployment Advice

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Canadian Forces Health Services Group

Brief Description: A major program activity for the Communicable Disease Control Program (CDCP) is development of health protection policy (e.g., immunization, personal protection against insect bites) and international deployment recommendations (e.g., what interventions to use for location x). To achieve this requires integration of: research and regulatory information; medical intelligence; operational requirements; and, individual/organizational values and preferences. Increasingly, we have emphasized objective evaluation of evidence and consequent risk assessment in our policy and recommendations. The upshot, at least in some situations, is a more nuanced and evidence-based product. To highlight how we use evidence to inform our decisions, we will describe: Two policy products: "Typhoid Prevention in the Canadian Armed Forces" and "Use of Personal Arthropod Repellents to Prevent Arthropod Bites and Associated Diseases"; and, Two deployment recommendation products: "Health Protection Recommendations for Deployment to West Africa in Support of Ebola Virus Disease Response" and "Health Protection Recommendations for Personnel Deployed to Nepal in Support of Earthquake Relief Operations".

We also will discuss major challenges related to developing evidence-informed policy and recommendations, including: estimating baseline risk; developing decision-thresholds; properly balancing policy/recommendation specificity and sensitivity; and, reconciling evidence with operational necessity.

Clinical Outcomes: Maximizing health protection through careful balancing of harms and benefits, while also meeting operational requirements.

Patient Population: Canadian Armed Forces (CAF) personnel subjected to the risks of communicable diseases, health care

providers who implement CDCP policies and recommendations and CAF leadership who have responsibility for protecting the health of their personnel.

Conclusion: CDCP policy and recommendations are becoming increasing reliant on careful and objective evaluation of evidence and consequent risk assessment. This approach, which is consistent with the trajectory of medicine generally and public health more specifically, presents several challenges. First, increasing specificity is not always reconcilable with operational uncertainty. Second, products can be more nuanced (less black and white) which can make implementation more challenging. Third, establishing decision-thresholds is imprecise and based on judgement. Finally, the approach is resource/expertise intensive.

4B04: Mental Health Awareness, Prevention and Stigma Reduction for Canadian Police Services

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Brief Description: The Canadian Armed Forces (CAF) and Mental Health Commission of Canada (MHCC) Opening Minds have worked together for the past three years to adapt the CAF's Road to Mental Readiness (R2MR) mental health training and education program to Canadian Police organizations. Since 2012 the adapted program has been delivered to Police services across Canada including those in Calgary, Edmonton, Vancouver, Quebec City, York, Peel Region, and the Royal Canadian Mounted Police (RCMP) in New Brunswick and the Ontario Police College. The program is based on the premises that mental health concerns can be temporary and reversible if identified early; that employees who understand normal reactions to stress and how to manage these reactions are more resilient; and that it is possible to train people to recognize changes in their own mental health as well as that of their peers and colleagues.

Clinical Outcomes: The overall goals of the R2MR training program are to improve both short-term performance and long-term mental health outcomes while reducing stigma and other barriers to care and encouraging early access to care. The training also provides tools and resources to manage and support those who may be experiencing mental illness, while assisting supervisors in maintaining their own mental health as well as promoting positive mental health in their work environment.

Patient Population: The program has been adapted for Canadian Police organizations, with two training levels for police employees and police leadership.

Conclusion: Evaluation results show a reduction in stigma that often surrounds mental health problems and mental illness and an increased confidence in the ability to apply strategies to manage the demands of police work. Participants also report that they find the training content to be relevant in both their work and home lives.

5A03: Leading Change in Canadian Military Medicine: Determinants of Success, 1685-2015

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Introduction: Success in military force health protection has more to do with the creation of systems of knowledge, efficient organizations, and command responsibility for the implementation of best practices than it does with the development of novel medical technologies or treatments. To achieve success, military leaders, both commanders and senior medical personnel, must be able to lead change effectively to create these systems in their organizations. Even in recent times military forces have suffered crippling preventable losses when public health best practices were not implemented properly, e.g., the 1999-2000 Dengue Fever outbreak among Canadian Armed Forces (CAF) personnel in East Timor and the 2003 outbreak of malaria in US troops serving in Liberia. Yet, at various times in Canadian history certain military leaders achieved noteworthy success in force health protection by systemic implementation of best practices. To date, no academic study has been made of the factors that led to their successes.

Methodology: This paper will use concepts articulated in CAF leadership publications, especially those related to institutional and strategic leadership, as the analytical framework to assess which determinants of success in military medical leadership might still be applicable today. Our historical analysis will examine the careers of some of those who have had outstanding success in leading change in force health protection since the beginning of the practice of military medicine in Canada, so that we can understand which factors have consistently predicted successful force protection outcomes.

Results: Preliminary research of over 300 years of military medicine in Canada has indicated that successful force health protection is not just a function of individual knowledge or leadership, but comes from the ability to create and sustain a distributed medical leadership culture and best health practices throughout a military force.

Conclusion: CAF leadership doctrine provides an excellent framework for analyzing how leaders achieved success in force health protection in our past. However, the Surgeon General of the CAF has noted that we often do not learn from our past in matters of force health protection. One of the reasons for this situation is that we do not have a history of how our best leaders achieved success by implementing change in their organizations - this research is a first step in rectifying this situation by systematizing the historical experience of those leading military medicine into concrete lessons that can be applied today.

6A03: Prevalence, Circumstances and Correlates of Military Work-related Sexual Assault in the CAF

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Introduction: Research has shown that military work-related sexual assault (MWSA) is prevalent, underreported, and associated with mental and physical health problems, increased healthcare costs, and reduced productivity. Female military per-

sonnel are especially at risk for MWSA. The majority of MWSA research, however, is based on US personnel, uses survey data on unrepresentative samples or with low response rates, and does not distinguish between MWSA and other forms of sexual trauma. As a result, it is difficult to place MWSA and its mental health consequences in a larger perspective of lifetime trauma and population mental health.

Methodology: The data were collected as part of the 2013 Canadian Forces Mental Health Survey, an in-person interview with a many measures of mental health, a representative sample ($n = 6,700$) and an excellent response rate (80%). Lifetime sexual trauma was assessed using the PTSD module of the Composite International Diagnostic Interview (CIDI). MWSA was defined as unwanted touching or forced sexual activity that occurred in the military workplace or on deployment, or that was perpetrated by military or civilian personnel.

Results: Women were more likely than men to experience both lifetime sexual assault and MWSA. Specifically, 39.9% of women and 6.82% of men had experienced lifetime sexual assault. Of those, 35% of women had had one or more MWSA (vs. 10% of men), resulting in an overall prevalence of MWSA of 14% in women, 0.7% for men, and 2.5% for the predominantly male CAF population as a whole. Among women, those who deployed were at increased risk for MWSA; approximately one-quarter of MWSA occurred on deployment, and more than half occurred in garrison. Analyses indicated that, after controlling for lifetime trauma, both MWSA and lifetime sexual assault were associated with an increased likelihood of having had a mental health disorder, including PTSD, in the past year and over the lifetime.

Conclusion: Results suggest that female CAF members, particularly those who have deployed, are at much higher risk than their male counterparts for MWSA. Consistent with previous research in the US military, female CAF personnel who have experienced MWSA are also more likely to have mental health problems, including PTSD. These findings will inform the prevention and control of MWSA in the CAF.

Poster Presentations

P124: Delay to Care in a Cohort of CAF Personnel with Deployment-related Mental Disorders, 2002 - 2011

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Introduction: The Canadian Armed Forces (CAF) have incrementally strengthened their mental health system over the past 15 years in an effort to eliminate barriers to care-seeking, minimize delays to needed care, and optimize clinical and occupational outcomes. This study investigated associations between the accumulation of change in the CAF's mental health system that had been implemented over time and delay to care-seeking in a cohort of CAF personnel diagnosed with deployment-related mental disorders.

Methodology: 415 individuals with an Afghanistan service-related mental disorder were identified from medical records of a weighted, stratified random sample of 2014 individuals selected from a cohort of 30,513 personnel deployed on the mission in

Afghanistan. Delay to care was measured from individuals' most recent Afghanistan-related deployment return date to their diagnosis date for mental disorders that were Afghanistan service-related. The delay to care follow-up period for individuals covered the calendar time frame of 28-February-2002 to 24-January-2011 and was categorized into five eras: 2002/04, 2005/06, 2007, 2008, and 2009/10. Cox regression explored the association between delay to care and era, handled as a time-varying covariate. Clinical, sociodemographic, and military characteristics were assessed as potential confounders.

Results: 13.5% of the cohort had an Afghanistan service-related mental disorder over a median follow-up of 3.7 years. Mean delay to care was 551 days [95%CI: 501-602]; the median was 400 days. Delay to care decreased in subsequent eras relative to 2002/04; however, this was only statistically significant for the 2009/10 era (adjusted HR: 3.01 [95%CI, 1.91-4.73]). The Kaplan-Meier estimates of the cumulative proportion diagnosed and receiving care for each era suggests that reductions in delay to care with the most recent era were largely realized among individuals who delayed seeking care for longer periods. It was also noted that delays to care were shorter for females and individuals in the junior non-commissioned member ranks but longer for individuals with less than 5 years of military service, those with non-musculoskeletal comorbidity and those in the operations support occupation category.

Conclusion: CAF mental health system changes were associated with reduced delays to mental health care.

P125: Occupational Therapy for Military Members with mTBI

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Introduction: Since 2000, more than 300,000 cases of mild traumatic brain injury (mTBI) have been documented in the U.S. Military. Service members with mTBI and lingering cognitive, physical, and emotional symptoms are often referred to occupational therapy (OT) services; however, there is a dearth of evidence for effective OT interventions for mTBI. The OT scope of practice includes basic and instrumental activities of daily living, rest and sleep, education, work, leisure and play, and social participation. The objectives of the OT for TBI study are to identify the needs of service members with mTBI that can be addressed by OT, understand the impact of symptoms on activities of daily living, identify the reasons that service members with mTBI are referred to occupational therapy, and describe the typical course of treatment.

Methodology: This qualitative study will employ semi-structured interviews as the method of data collection. Participants include active duty service members diagnosed with mTBI and their spouses. In addition, health care providers who treat concussion/mTBI are interviewed to understand typical patterns of care. Military personnel who have supervised service members with mTBI will also be interviewed to provide a perspective of performance deficits observed in the work environment. Interviews will be conducted face-to-face at times and locations convenient to the participants. Data analysis involves content, thematic, and narrative analysis of

interview transcripts. This research is still in progress.

Results: Preliminary findings indicate that in addition to lingering symptoms, active duty service members with mTBI experience disruption of family and work roles, leading to feelings of incompetence. Daily and weekly routines are less structured as a result of attending multiple healthcare appointments each week. Disturbances in the quality and quantity of sleep are present in nearly all service members, exacerbating other symptoms. Healthcare providers report that addressing multiple diagnoses, such as depression, anxiety, and post-traumatic stress disorder, creates a challenge in working with this population. Problems with memory and cognition are the most common reasons for referral of service members with mTBI to OT services.

Conclusion: Although the study is still in progress, preliminary results suggest that scheduling health care appointments at consistent times would increase the amount of structure in weekly routines of service members with mTBI. Sleep disturbances affect many other symptoms and should be a primary focus of treatment by all providers. OT intervention can focus on providing experiences of competence in tasks associated with significant life roles.

P126: Environmental Health Site Assessment Operation IMPACT, Kuwait

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Department of National Defence

Introduction: Op IMPACT is a deployment wherein Canadian Armed Force (CAF) personnel provide air support for missions in Iraq. The Deployable Health Hazard Assessment Team (DHHAT) was tasked to conduct a focused Environmental Health and Public Health Survey from 9 to 22 January 2015 at Ali Al Salem air base (ASAB) and Ahmed Al Jaber air base (AJAB) in Kuwait, where Op IMPACT is taking place.

Methodology: 208 air, soil and water samples were taken at ASAB and AJAB and sent for laboratory analysis. Air was analyzed for particulate matter (PM), Polycyclic Aromatic Hydrocarbons (PAHs), volatile organic compounds (VOCs), and aerosolized metals exposure. Soil samples were screened for metals, PAHs, and VOCs using gas-chromatography-mass spectrometry. Water samples were analyzed and compared to the criteria outlined in the Canadian Drinking Water Quality Guidelines (CDWQG).

Results: The analytical results for soil, and water did not exceed health based guidelines. As for air quality, the highest ambient air level of $PM_{2.5}$ was 0.054 mg/m^3 . This concentration is within the US Environmental Protection Agency Air Quality Index (EPA AQI) "unhealthy for sensitive groups" category (range 0.035 to 0.055 mg/m^3). However, given the short overall length of the tour and the variability in day to day air quality, one would not expect chronic or delayed onset illness in screened and fit CAF populace deployed on Op IMPACT. At ASAB the highest detected level of respirable PM was 0.14 mg/m^3 and total PM was 0.29 mg/m^3 . At AJAB the highest detected level of respirable PM was 0.17 mg/m^3 and total PM was 0.23 mg/m^3 . The respirable PM and total PM results from both locations

were below the American Conference of Governmental Industrial Hygienists' (ACGIH) threshold limit value-time weighted average (TLV-TWA's) of 3 and 10 mg/m^3 , respectively. Bromate concentration in ablution water reported to be slightly above the CDWQG recommended level.

Conclusion: The environmental data collected and analyzed was compared to health-based guidelines and standards. The results of chemicals measured in soil and water samples did not exceed their respective health thresholds. Ablution water was considered non potable because of its vulnerability and air quality varied from one day to another. The level of $PM_{2.5}$ varied from good to unhealthy AQI categories. The maximum concentration found was in the US EPA AQI category of "unhealthy for sensitive groups" but given the short length of the tour and variability in day to day air quality, one would not expect continued, chronic, or delayed onset of illness in the CAF population deployed in support of Op IMPACT.

P127: Work Environmental Factors and Major Depressive Episode in Canadian Military Personnel

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Introduction: Depression is the mood disorder with the highest prevalence in Canadian Military personnel. Compared to civilians, military personnel have significantly higher prevalence of past-year major depression (4.7% vs 8.0%). Research has shown that negative work environmental factors can increase the risk of developing depression. This research was conducted to determine this association.

Methodology: Data from the 2013 Canadian Forces Mental Health Survey were used (N 8,200). Past -year major depressive episode (MDE) was measured using the World Mental Health Composite International Diagnostic Interview 3.0 (WMH CIDI). Work environmental factors were measured using the subscales of the Job Content Questionnaire (i.e. Decision authority, skill discretion, psychological demands, job insecurity, physical exertion, social support from coworkers and supervisor, and job satisfaction). Logistic Regression analyses were conducted to explore the association.

Results: Crude logistic analyses indicate that military personnel with high levels of work stress related to decision authority, skill discretion, psychological demands, job insecurity, social support, and job satisfaction were at higher odds of past-year MDE compared to those who reported lowest levels of work stress on those variables. Low job satisfaction, and low social support from coworkers and supervisors seem to be the highest contributors to past-year MDE (Crude ORs: 4.4 (95% CI: 3.6-5.4); 2.4 (95% CI: 2.0-3.0) respectively). However, military personnel exposed to high work stress related to physical exertion were less likely to have past-year MDE (Crude ORs: 0.8 (95% CI: 0.7-1.0)). The results for Regular personnel were comparable to that of Reserve personnel except for psychological demands and for physical exertion. A significant association was found between past-year MDE and those variables for Regular but not for Reserve personnel.

Conclusion: The findings indicate that negative work environmental factors might be contributing to the high prevalence of

depression in Canadian Military personnel. Particular attention should be given to those who reported not being satisfied with their jobs (12%), since they seem to be at significantly higher risk of depression. Interventions to reduce work stress, and to increase job satisfaction and social support from coworkers and supervisors might help reduce the prevalence of depression in military personnel. The results for physical exertion could be explained by the high level of physical activity characteristic of the military. Research has demonstrated that physical activity can help reduce depressive symptoms. Further adjustment by demographic and military specific variables will be conducted and the results will be made available at the Forum.

P128: Eleven Years of Air Quality Monitoring in Afghanistan

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Department of National Defence

Introduction: Force Health Protection activates its Deployable Health Hazard Assessment Team (DHHAT) when tasked by the Canadian Joint Operations Command to conduct assessments of potential health hazards in the Canadian Armed Forces (CAF) area of operation. DHHAT was present throughout the CAF's mission in Afghanistan with 11 Technical Assistant Visits (TAVs) being successfully completed over an 11 year period. The TAVs took place in either Kabul or Kandahar depending on where CAF personnel were living and working. The focus of these Afghanistan TAVs varied depending on each deployment's specific environmental and occupational concerns. The emphasis of this article will be on the air quality in Afghanistan since air quality was the main health concern throughout this mission.

Methodology: Each Afghanistan TAV generated thousands of individual air quality results. In order to sort through these results and pick out those that were most likely to cause either short-term or long-term adverse health effects (also called compounds of potential concern), each result was compared to internationally recognized health benchmarks, guidelines or standards. Exceeding these typically conservative thresholds does not necessarily imply that adverse health effects would occur but rather raises the need to conduct a toxicological assessment.

Results: Over the 11 years of ambient air quality monitoring in Afghanistan, thousands of samples were taken from various groups of compounds: particulate matter (PM), crystalline silica, asbestos fibres, volatile organic compounds (VOCs), metals, elemental carbon, polycyclic aromatic hydrocarbons (PAHs), dioxin and furans (D/F), sulfur oxides, nitrogen oxides and ozone. Among all of the sampling conducted, three analytes were identified as compounds of potential concern: D/F, crystalline silica and PM. The D/F toxicological assessment revealed no significant risk of adverse chronic health effects would be expected. However, CAF members' exposures to PM and crystalline silica were, at times, enough to pose acute health effects such as eye, nose, and throat irritation as well as respiratory symptoms. Although there is currently little scientific evidence to support clinically significant delayed-onset or long-term health effects following these sporadic high exposures, research in this area is limited and still ongoing, making definitive interpretation of

health risk assessments a challenge.

Conclusion: Of all the air quality sampling conducted by DHHAT in Afghanistan over 11 years, crystalline silica and PM were identified as compounds that could cause acute short term health effects while research is still ongoing to determine potential longer term health effects.

P129: The Soldier System Effectiveness Survey

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Introduction: Military personnel face a key challenge with the Canadian Armed Forces (CAF)-issued personal equipment while operating in various environments and under different stressors. Although the CAF-issued personal equipment has steadily improved during the last decade, it still is a source of criticism. Many soldiers purchase items to replace or complement their issued personal equipment. To keep the CAF at the cutting edge with the most modern equipment, we must first understand the actual components of the soldier system (purchased or issued) and identify the areas of the issued personal equipment that must be improved or replaced in order to enhance the effectiveness of our soldiers while mitigating injuries. One way to achieve this goal is to directly ask military personnel what should be changed and/or added on the issued personal equipment list.

Methodology: An online survey was developed and administered to 120 soldiers from infantry, combat engineers, and medical personnel located on the CAF bases in Edmonton, Gagetown, Valcartier, and Petawawa. Participation was completely voluntary and entirely anonymous. Personal information such as anthropological and experience data were collected and analyzed as group data in order to assess the participating sample. The primary focus of the survey was to gather information – the what and why – on the CAF-issued personal equipment that is replaced by personal purchases, and on the items not available on the CAF-issued personal equipment list but seen as desirable by soldiers, and often purchased individually. The second objective was to identify the characteristics and reasons motivating the choice of the purchased items, and finally, to establish an average cost of extra equipment spending per soldier.

Results: Preliminary results show that trade and experience, such as years in the trade, rank and deployments, play an important role in the selection of which items would be changed throughout a military career. Moreover, experienced soldiers are likely to change numerous items and to spend several hundreds of dollars compared to unexperienced or less experienced soldiers. The survey found that backpacks, boots, gloves, ballistic eye wear, and slings are the items most frequently changed by soldiers.

Conclusion: This study identified optimization areas for the CAF-issued personal equipment list that may improve effectiveness, and potentially mitigate injuries. It also identified the current soldier system components and requirements for future materiel acquisitions.

P130: Clinical Insomnia in Workers with Delayed Recovery from mTBI

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Introduction: Insomnia in persons with mild traumatic brain injury (mTBI) has not received much research attention despite its potential influence on recovery. This study aimed to evaluate the prevalence of insomnia in Ontario workers with delayed recovery from mTBI. In addition, its relationship with socio-demographic, TBI- and claim-related, behavioural, and clinical factors was evaluated.

Methodology: This was a cross-sectional study carried out over a period of 24 months in a large rehabilitation hospital in Ontario. To assess the prevalence of insomnia, we used the Insomnia Severity Index (ISI). Data were collected from standardized questionnaires, insurer records, and clinical assessment at the time of recruitment. Bivariate associations were calculated using the Spearman's correlation coefficient or ANOVA. We present stepwise multivariable linear regression models of factors associated with insomnia. To ensure the appropriateness of utilizing the ISI in persons with mTBI, additional analyses included an assessment of the internal consistency of the instrument.

Results: Of the 94 participants diagnosed with mTBI, clinical insomnia was reported by 69.2%. The mean age was 45.20 ± 9.94 years; 61.2% were men and 39.8% were women. No gender differences were observed in the prevalence or severity of insomnia. Insomnia was significantly associated with certain socio-demographic, claim-related, behavioural, and clinical variables. In the multivariable regression analysis, several determinants explained 53% of the insomnia variance. The internal consistency of the ISI, as measured by Cronbach's α , was 0.86.

Conclusions: Insomnia is common in persons with delayed recovery from mTBI, and is significantly associated with potentially modifiable clinical and non-clinical variables. Care of persons with brain injury requires greater attention with regard to the diagnosis and management of insomnia and associated disorders.

P131: Mental Health and Forensic Odontology: Awareness and Prevention

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Brief Description: Mental health is of critical importance to both individual wellbeing and to military operational readiness. In order to provide Canadian Armed Forces (CAF) personnel with skills and knowledge to manage the demands of service, perform effectively and identify early indicators of distress, the CAF developed the Road to Mental Readiness (R2MR) mental health training and education program. While all CAF personnel are exposed to R2MR throughout their career, certain occupations may be at higher risk of mental health difficulties as a result of unique aspects of their employment. Specialized curriculum for Dental Officers who pursue advanced training in Forensic Odontology was developed in 2012 and has been implemented

in collaboration with British Columbia Forensic Odontology Response Team (BC FORT).

Clinical Outcomes: Relying on published research regarding the emotional and psychological impact of conducting forensic dental identification, the training increases awareness of the unique stressors of this type of work, and the potential impact on performance and mental health. With detailed information on the human stress response and its impact on cognitive functioning, the program aims to help participants better understand the importance of managing their stress response in order to perform effectively in the short term and potentially mitigate longer term mental health outcomes. It includes the teaching and practice of simple skills that individuals can apply to manage their physiological response to stress, while also highlighting the roles of both peers and leaders in maintaining optimal mental health. Program feedback indicates that participants have an increased understanding of the stress response in demanding occupational settings and its impact on performance, and increased confidence that they can use specific skills and strategies to effectively manage their stress response.

Patient Population: The program is designed for CAF dental officers who are selected for and attend advanced training in forensic dental identification.

Conclusion: Now in its fourth year, outcomes and feedback from this training will inform future program development for this occupation and others that face similar demands.

5. Novel Health Technologies

Podium Presentations

1C02: Ultrasound-assisted External Fixation: A New Technique for Austere Environments

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Introduction: The use of ultrasound to assist external fixation of long bones has not been investigated previously. This technique could enhance extremity damage control surgery in locations without fluoroscopy, such as forward surgical elements, the intensive care unit, and spacecraft. This pre-clinical study specifically sought to evaluate orthopaedic surgeons' ability to define fracture patterns and the associated zone of injury in order to improve surgical decision-making and direct safe Schanz screw insertion.

Methodology: We encased composite left femurs in a cylindrical echogenic gelatin matrix to simulate a human thigh. Fractures, classified according to the AO-OTA system, were created with a high-speed cutting tool. Three orthopaedic trauma surgeons with no prior ultrasound experience underwent a 15-minute training session during which they were taught to use sonography to diagnose fractures and assist external fixation. They were then presented with five specimens in a randomized sequence. The specimens included three diaphyseal fractures (AO 32-A2, 32-C2 and 32-C3), a distal femur fracture (AO 33-A1.2),

and an intact femur, all encased in an opaque black gelatin matrix to blind the participants to the underlying pathology. The surgeons were instructed to proceed with ultrasound-assisted external fixation if they diagnosed a diaphyseal fracture. The appropriate management of the distal fracture was knee-spanning external fixation (not performed in this model). The time of each procedure was recorded. Schanz screw position proximal and distal to the fracture site was measured. It was established *a priori* (and mentioned to the surgeons) that Schanz screws should be inserted no closer than 40 mm from the fracture to avoid the zone of injury.

Results: Diagnostic accuracy for the presence of fracture was 100%. Surgical decision-making was correct in all cases. All intact femurs were recognized as such. The need for a knee-spanning external fixator was recognized in all fractures of the distal femur. The three surgeons performed adequate ultrasound-assisted Schanz screw placement in every case of diaphyseal fracture in an average time of 6 mins 38 secs. The screws adjacent to the fracture site were on average 58 mm (SD 11 mm) from the edge of the fracture.

Conclusion: With minimal training, orthopaedic surgeons can use ultrasound to diagnose femur fractures, decide the required external fixator configuration and safely insert Schanz screws outside the zone of injury. Our model is a successful partial task trainer that can be used for point-of-care ultrasound education and research.

1C04: Establishing Individual Electrocardiogram (ECG) Profiles to Support Multi-use Health and Security Applications

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Introduction: Cost effective, wearable sensors make it easy for a commander to remotely acquire a large amount of physiological data from operators in the field. While these data streams may be overwhelming and ineffective on their own, they can be fused together in a platform approach to derive useful, decision-quality information.

Our current work focuses on verifying identity and detecting abnormal health information from real-time electrocardiograms (ECG). To do this, an individualized baseline ECG waveform must first be established. However mobile, real-time monitoring of ECG introduces increased intra-individual variation (e.g., heart rate changes), poor signal quality, and unpredictability. This research investigates the impact of heart rate when establishing ECG baselines.

Methodology: ECG was recorded using a base-layer shirt with integrated sensors. The recordings encapsulated daily activities, which included physical activity at an elevated heart rate. Baseline templates were then generated at multiple heart rates.

The rest of the data was divided into segments. Within each segment, heart rate was calculated and a test template was generated. Similarity scores were generated comparing each test template with the baseline enrolled templates. These scores determine how well the baseline template represented the test templates.

Results: When comparing test ECG segments to a baseline tem-

plate, initial work shows a notable relationship between similarity scores and the difference in heart rate. Specifically, there is less similarity when there is a large difference between the heart rate of the test ECG segment and the heart rate of the baseline template. By factoring in aspects of heart rate related variation, we can make our analytics platform more robust to the challenges of mobile physiological monitoring.

Conclusions: Remote physiological monitoring is an integral part of future soldier systems. These signals can help facilitate mass casualty triage, monitor soldier fatigue, and provide continuous security credentials and access control. Additionally, health status information can help guide search and rescue operations for injured/captured personnel in high risk environments. Fusing physiological data streams in a platform approach can transform these often overwhelming data streams into decision-quality information, improving commanders' situational awareness.

2B03: Comparison and Validation of Sleep Models to Predict Cognitive Performance

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Defence Research and Development Canada

Introduction: Sleep deprivation is a common stressor in military and sleep deprivation-induced fatigue has been recognized as a major factor influencing operational performance. Mathematical models to predict fatigue are valuable tools. Most of these models are based on sleep/wake schedules and validated in the aviation and transportation industry. We have developed a new fatigue model to help the Canadian Armed Forces (CAF) better predict the performance of its soldiers in terms of workload, pharmaceutical and light countermeasures, jet lag, and night shift. We have also extended the capability of the model by adding a sleep prediction function to evaluate the effect of work schedules. In this presentation, we compare three types of sleep models and predictions of cognitive performance from our fatigue model against experimental data.

Methodology: Mathematical equations for each sleep prediction model were found in the literature and programmed using MATLAB. Each model was run for a work schedule scenario to predict sleep and wake times. The predictions were compared against experimental data. The predicted sleep/wake schedule was used as an input in our fatigue model to predict cognitive performance. The predicted performance was also compared against experimental data.

Results: We identified three types of sleep prediction models. Model 1 by Acherman and Borbley, and Model 2 by Akerstedt et al. were based on two primary components: a sleep homeostasis system and a circadian system, but described differently in mathematics. Model 3 by Darwent et al. was based on the observation of sleep patterns of long-haul commercial aviation pilots during layovers following international travel across multiple time zones.

All sleep models' predictions for sleep onset, wake-up time and sleep duration were within a 2-h range compared to the experimental data. The largest discrepancies were for the sleep onset of night shift by model 3 (0.67 h), wake-up time of morning shift by

each model (1.52 h) and sleep duration of night shift by model 1 (1.98 h). The operational significance of the discrepancies needs further investigation.

The cognitive performance predicted based on the sleep/wake time of each sleep model showed similar profiles. The mean square of errors between the predictions and experimental data are 3.51, 4.13, 3.30 corresponding to sleep models 1, 2 and 3, respectively. The model predictions need to be compared in an applied setting.

Conclusion: Sleep and cognitive performance can be predicted based on work schedules. The predictions need to be compared and validated in a field-based study.

2C01: High Fidelity Simulation of Primary Blast: In Vivo and In Vitro Effects

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Defence Research and Development Canada

Introduction: The role of primary blast in blast-induced traumatic brain injury (TBI) is controversial. Few clinical cases have been documented where injury has been attributed to primary blast, while laboratory studies are difficult due to the challenges associated with generating primary shock wave insult in isolation from other blast components.

Methodology: An Advanced Blast Simulator (ABS) has been developed that enables high fidelity simulation of free-field blast waves, including sharply defined static and dynamic overpressure rise times, underpressures and secondary shock waves. Rats or rat brain cell aggregates were exposed in head-only fashion to single pulse blast-waves of 15-30 psi static overpressure.

Results: No overt signs of trauma were present in the animals post-exposure. However, significant changes in brain CNPase and neurofilament heavy chain levels were evident by seven days. In contrast to most studies of primary blast-induced TBI, no elevation of glial fibrillary acidic protein (GFAP) levels was noted. Similarly, exposure of shell-encased rat brain cortical aggregate cultures to single pulse shock waves (15-30 psi) resulted in neither cell death nor changes in GFAP levels, although CNPase catalytic activity was elevated.

Conclusion: This work provides convincing evidence that primary blast directly causes changes in brain function, and also shows that the widely used TBI biomarker GFAP is not indicative of this type of brain damage.

2C02: Differential Regulation of the Akt Signal Transduction Pathway in the Rat Brain after Primary Blast Induced mTBI

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Defence Research and Development Canada

Introduction: Traumatic brain injury (TBI) has been a leading cause of morbidity and mortality in recent conflicts in Iraq and Afghanistan. However, the mechanisms of blast-induced TBI are not known. Akt, also known as Protein Kinase B (PKB), is a serine/threonine-specific protein kinase that plays a key role in mul-

tiplied cellular processes such as glucose metabolism, apoptosis, cell proliferation and survival, transcription and cell migration. Changes in the levels of both total protein and phosphorylation status of Akt have been implicated in brain injuries and neurodegenerative diseases, such as Alzheimer's disease. In the present study, the effect of a simulated single pulse primary blast wave on the levels of Akt and its downstream effector kinase, glycogen synthase kinase (GSK β), in rat hippocampus and frontal cortex were investigated.

Methodology: Male Sprague-Dawley (SD) rats (350 – 400 g) were stabilized in plastic sleeves and 3% isoflurane (in oxygen) anesthetic was conducted for minimum 8 min. The sleeves were then placed in the shock tube with the rat head positioned in the test area for shock wave exposure (25 psi for approximately 4 msec positive Weissduration). This system has been developed so that simulated single pulse "primary blast" exposure is accomplished with only minimal concussive and whiplash effects. After exposure, rats were closely observed for either 1 day or 7 days before being sacrificed. For western blot analysis, both sides of the hippocampus and frontal cortex were dissected in dissection buffer and homogenized, and then stored at -80°C until further analysis. For immunohistochemistry, rats were perfused and post fixed with 10% formaldehyde. Phosphorylation of GSK was detected using the p-GSK3 β antibody.

Results: Results showed that Akt and GSK phosphorylation were decreased or little changed 1 day after blast in both the hippocampus and front cortex. However, p-Akt and p-GSK levels were dramatically increased 7 days after blast on the ipsilateral side of the hippocampus, while p-GSK was also significantly increased on the contralateral hippocampus. Furthermore, p-Akt was increased on the contralateral cortex while p-GSK was increased on both sides of the frontal cortex. No significant changes in total protein levels of Akt and GSK were observed in both the hippocampus and front cortex.

Conclusion: Because both Akt and GSK phosphorylation have been indicated in neuro-protection and neuro-damage, changes in the levels of Akt and GSK phosphorylation may contribute to neuropathology observed after primary blast exposure. Therapies targeting Akt and GSK phosphorylation pathways may help to protect the brain against blast-induced TBI.

2C03: Explore the Potential of MicroRNAs as a Biomarker for TBI in Mammalian Hair Follicle

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Introduction: With the wide adoption of explosive-dependent weaponry, blast-induced traumatic brain injury (TBI) has become a significant medical issue for military personnel. Recently, the implementation of microRNAs (miRNA) as a clinical biomarker has been proposed for diseases, including several types of cancer. The interaction between miRNAs and their corresponding mRNA targets usually leads to translational silencing or mRNA degradation. This work investigates the involvement

of miRNAs in primary shockwave-induced TBI responses in rat whisker follicles.

Methodology: With an advanced blast simulator, we assess the molecular responses in the whisker follicles in the rat model, which was exposed under a series of single blast intensities (15, 20, 25 and 30 psi). Gene networks for miRNA-dependent gene expression were constructed using sub-network enrichment analysis (SNEA) with respect to shared and shockwave intensity-specific microarray transcription profiling. Based on the SNEA analysis, core miRNAs (miR-26a, -27b, -29a, -34a, -181c and -183) were measured using quantitative RT-PCR. All the miRNA levels tested decreased in abundance in the whisker follicles following shockwave exposures.

Results: The results suggest shared responses across multiple intensity exposures, e.g. miR-183 in all intensities, whereas exposures at 15 and 20 psi triggered specific miRNA expressions, i.e., miR-29a and -34a, respectively. Multiple pathways and biological processes (e.g. DNA repair and mRNA processing) were enriched following a gene set enrichment analysis (GSEA).

Conclusion: Our study provides the first evidence that miRNAs are responsive to shockwave exposures in mammalian hair follicles and these molecules may be useful biomarkers for primary blast-induced TBI.

2C05: Metabolomics Profiling of Concussion: A Novel Diagnostic Method

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Introduction: Concussion is a major public health concern, often resulting in significant acute symptoms and in some individuals, long-term neurological dysfunction. Diagnosis of clinically significant concussion can be difficult, as are the decisions to stop activities. It is also unclear when concussion patients should return to normal daily undertakings. Thus, there is great interest in discovery of biomarkers to aid in concussion diagnoses, prognoses and rehabilitation. Metabolomics may aid biomarker discovery by measuring a person's small metabolite profile (<1500 Daltons). The allure of metabolomics lies with the concept that metabolites fall downstream of genetic, transcriptomic, proteomic, and environmental variation, thus providing the most integrated and dynamic measure of phenotype and medical condition. We hypothesized that concussions could be accurately diagnosed by an individual's metabolic profile.

Methodology: Male hockey players (used as a surrogate for military personnel) were recruited within 72 hours of a concussion, determined by a mechanism of injury followed by the onset of typical concussive symptoms, and in the absence of a structural injury. Blood was drawn and plasma samples were analyzed by 1H NMR and DI-LC-MS/MS. Non-injured control subjects that were age-, sex- and sporting activity-matched, and that had not suffered a past concussion, were also recruited. Any subject with a known neurological insult or disease was excluded. Metabolomic profiles were analyzed with Principal Component Analysis

(PCA) and with t-distributed stochastic nearest neighbor (t-SNE) embedding algorithm.

Results: Blood plasma was assayed from 10 concussion patients and 16 controls; matched for age, sex and sporting activity level ($P=0.213$). The estimated time from concussion occurrence to blood draw at the first clinic visit was 2.3 ± 0.7 days. A total of 174 metabolites were measured, 31 by 1H NMR and 143 by DI-LC-MS/MS. Using PCA, the leading 10 components (each with the top 10 weighted metabolites) were shown to account for 82% of the data variance. Cross-validation of the classifier using a leave-one out approach demonstrated a 92% accuracy rate in determining a concussion. A chi-squared test was then used to minimize the number of metabolites required to achieve a reasonable classification accuracy, and demonstrated a 92% diagnostic accuracy with only 20 metabolites. The diagnostic accuracy increased to 95% using recursive feature elimination with 40 metabolites.

Conclusion: Using blood metabolic profiling, together with multivariate statistical analysis and machine learning, we identified concussed individuals with up to 95% certainty. Metabolomics profiling represents a novel diagnostic method for concussion.

2F02: Electronic Data Capture using REDCap: A Bridge between Research and Clinical Care

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Brief Description: Mild traumatic brain injuries (concussions) are common and insidious. Clinical outcomes of those who have suffered a concussion vary widely; the majority fully recover within weeks of their injury but a considerable minority experience persistent concussion symptoms (PCS). The most effective treatments of concussion and PCS are not well understood. The work of identifying effective treatments is currently inhibited by many factors including non-specific post-concussion symptomatology and other confounders such as co-morbid injuries, post-traumatic stress disorder (PTSD) and highly variable psychosocial determinants of health among patient populations.

Practice-based evidence is critical to overcome these challenges and improve clinical practice and research in concussion rehabilitation. Maximizing the utility of evidence requires thinking about data quality in a broad framework that addresses the needs of all data users, including patients, clinicians and researchers. Electronic data capture (EDC) using REDCap provides a web-based platform for capturing data in a way that engages patients as co-producers of their care and maximizes data quality for clinicians and researchers.

Dynamic reporting software (knitr) is currently being used to integrate clinical guidelines and high quality research from the literature into individual patient reports. This presentation will demonstrate the features of web-based data capture and dynamic reporting software that have been implemented at the St. Michael's Hospital Head Injury Clinic. Research applications of large databases and potential networks of databases with common data elements and structure will also be discussed.

Clinical Outcomes: These tools provide automatic scoring of assessments and incorporation of research data and clinical guidelines directly into clinical reports to provide clinicians with best evidence in a clinical setting. A clinical database has been developed for research purposes without the requirement of manual data entry or data validation.

Patient Population: An outpatient rehabilitation population that has experienced mild to moderate traumatic brain injury.

Conclusion: All stakeholders will benefit from an efficient system of data collection, analysis and presentation that is easy to use for both patients and physicians. Improving the use of data will increase the amount of time patients and physicians spend in the clinic focusing on recovery rather than details of documenting the injury and its sequelae.

4E01: Understanding the Soldier System - Complex but not Complicated

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Introduction: The ability to efficiently and accurately characterize the soldier as a system of systems has yet to be developed for the Canadian Army. A possible approach is the systematic decomposition of the dismounted soldier's elements and the definition of all the interrelationships. Such methodology would be valuable for assessing the S&T gaps (requirements vs. outcomes), and understanding the interrelationships that can be influenced between the soldier and their equipment with respect to the mission and environment. On the surface, characterizing the soldier and organizing the thousands of interrelationships that can be generated appears to be an overwhelming challenge; however the use of modern computing has allowed us to examine the problem from a different perspective.

Methodology: To decompose the soldier system and visualize the interrelationships the following methodology was followed: (1) data was sourced through surveys, soldier/regiment kit lists and subject matter interviews; (2) assignment was made of first degree relationships between nodes which were validated by experts in soldier systems; and (3) application of an ordered network wire diagram to visualize the data. By selecting any data point (node), its nodal relationships were allowed out to the third degree.

Results: By organizing the soldier system as an order network, with first degree relationships assigned by the team, we were able to effectively predict second and third degree relationships for any node. Further we were able to filter out nodes that were not within the scope of our influence as related to a particular node (eg several hundred interrelationships could be distilled down seven or eight) and this resulted in a simpler manageable ordered network to work with.

Conclusion: With modern day computing and visualisation tools, what appears on a 2D surface to be a complicated series of interrelationship may be simpler when the entire series of relationships are examined together in a 3D order network. This modelling approach can be applied directly to a number of military medical situations and processes. For example, when a new

node representing a particular mission threat is introduced into a military medical response network (or reactivated), the model is sufficiently agile to model decision points on equipment, re-supply, medical practitioner and facilities. The long term goal is to have the nodes offer links to literature supporting the characteristics of the node and its relational data.

4E04: Assistive Robotics for Amputees

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The War Amps

Brief Description: The purpose of the study was to explore other options for bilateral arm amputees other than the typical prosthetic limbs that are currently available. Above the elbow arm amputees, in particular, often struggle with successfully wearing and using prosthetic limbs, and just "make-do" without. The aim of this study was to determine if there was another product that could assist above elbow bilateral amputees with daily tasks and perhaps have health benefits as well.

Two bilateral above elbow amputees trialed an assistive robotic device mounted on a mobile platform for three months to try incorporating it into their daily activities, to reduce strain on their remaining limbs and musculoskeletal systems. The robotics had been proven beneficial when mounted on powered wheelchairs for those with mobility challenges in addition to complex medical conditions. It had not been designed for other uses.

Clinical Outcomes: A variety of daily tasks were completed using the assistive robotics, over a period of time, to evaluate the benefits, drawbacks, and possibilities for improvement. As the study progressed, the participants modified the tasks relative to the ongoing learnings. The two very different approaches to daily living provided unique perspectives as to which tasks could be successful for each participant, and which tasks proved extremely difficult to undertake.

Patient Population: Upper extremity amputees without restricted mobility, who are not candidates for artificial limbs yet desire to maintain independence with activities of daily living. There is anecdotal evidence that some of these amputees experience joint pain and other health deterioration. Above the elbow arm amputees face different struggles than those missing their arm(s) below the elbow.

Conclusion: The lessons learned were much different than initially predicted, from the tasks attempted to the design of the mobile platform. Two different user interfaces were designed and modified through working with the participants. Although both participants had the same amputation levels, their approach to daily living was vastly different, resulting in different successes and challenges with the assistive robotics.

Poster Presentations

P132: Application of a Novel Multiplex Immunoassay System for Quantitation of Neurological Injury Biomarkers

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Introduction: Traumatic brain injury (TBI) is a significant health issue affecting military personnel and Veterans. The high rate of TBI and concussion resulting from combat operations directly impacts the health and safety of individual military members and unit readiness. Reliable diagnostic/prognostic methods for TBI are lacking; many suspected TBI's go undiagnosed resulting in persistent neurological impairments. Current clinical and imaging modalities are often confounded by altered patient mental status and are poor at identifying mild-to-moderate injury. Since concussive symptoms are similar to those of posttraumatic stress disorder (PTSD), and these conditions often co-occur, definitive diagnosis of TBI is essential for recognition and treatment of each disorder. Important challenges include development of objective biomarkers for assessment of neurologic injury and outcome prediction.

Methodology: The objective was to evaluate a multiplex immunoassay system to simultaneously analyze plasma levels of seven recognized and novel biomarker candidates for the assessment of mild-to-severe TBI in adult patients (n=100). These markers were selected on the basis of their relative brain-specificities and potentials to reflect distinct features of TBI mechanisms, including (1) neuronal damage assessed by neuron-specific enolase (NSE) and brain derived neurotrophic factor (BDNF); (2) oxidative stress by peroxiredoxin (PRDX)-6; (3) glial damage by glial fibrillary acidic protein (GFAP) and S100b; (4) immune activation by monocyte chemoattractant protein (MCP)-1 and intercellular adhesion protein (ICAM)-5. Multivariable logistic regression and area under the receiver-operating curve (ROC) were used to evaluate predictive abilities of these markers for 6-month neurological outcome and mortality.

Results: The combined fold-changes in plasma levels of PRDX6, S100b, MCP1, NSE, and BDNF resulted in the formulation of a TBI assessment score that identified mild TBI with a ROC area under the curve of 0.97, when compared to healthy controls. Unfavorable neurological outcome was associated with elevations in s100B, GFAP, and MCP-1. Mortality was related to differences in 6 of 7 markers analyzed. Combined admission concentrations of s100B, GFAP, and MCP-1 were able to discriminate favorable vs unfavorable outcome (AUC= 0.83), and survival vs death (AUC= 0.87), although not better than s100B alone (AUC= 0.82 and 0.86, respectively).

Conclusion: This research demonstrates a multimarker profile of blood-based TBI biomarkers can be used as early diagnostic, prognostic, and monitoring adjuncts. Ideally, this multivariate assessment strategy will be refined with additional biomarkers that can effectively assess the spectrum of TBI and identify those individuals at particular risk for developing neuropathologies, so they may be removed from duty and receive appropriate care.

P133: Using Avatars to Assess Combined Physical, Cognitive and Psychosocial Changes following Brain Injury

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Introduction: There is still a great need for clinical tools sensitive to assessing physical, cognitive and psychosocial factors in order to evaluate readiness to return to duty following brain injury. Contextually based assessments focusing on military tasks are required. Virtual reality (VR), while still limited in clinical use, offers great potential to provide contextual control over personal and environmental factors. Building on previous work showing the utility of an avatar based VR platform (VRai) to assess residual executive dysfunction, the present objective is to show how this platform can be adapted to provide additional control of psychosocial aspects through avatars. Such additions to the VRai platform provide the potential to assess separate and combined physical, cognitive and psychosocial changes following brain injury.

Methodology: The VRai platform integrates three interconnected systems (motion capture; rendering software; display) to provide a full interactive experience between first-person avatars (FPAs within which the person is immersed) and third-person avatars (TPAs) programmed to date with simple physical interaction (motion reaction to the FPA). New adaptations to the rendering software include the ability to change lighting, climatic conditions and add explosions, smoke and fire. Such control of contextual detail allows the manipulation of environmentally-based stress levels. More specifically, innovative psychosocial interaction with the TPAs has begun through prerecorded reactions (running, fighting) triggered by set motions of the FPA. To further improve the ecological nature of the TPA interactive experience, facial emotional expressions are imbedded onto the TPA faces by installing a morphable 3D head modeled with graphics software that can also be triggered by FPA motion. This allows us to tap into social interaction. The general concept has the flexibility to be used with different hardware and software.

Results: Bench testing to date has provided proof of concept of the proposed additions to the VRai platform. A virtual scene including explosions, climatic condition changes (rain and fog) and fighter aircrafts passing-over have already been added as examples of difficult/stressful conditions. Facial morphing triggered by FPA movement has been successful. The next step is to collect data with subjects and verify level of immersion with the new TPAs.

Conclusion: The present adaptation of the VRai platform allows innovatively targeting simultaneous behavioural aspects to provide comprehensive, tailored military rehabilitation. As costs and technical accessibility in VR improve, it is important to be proactive in developing flexible VR platforms that can meet the needs of the CAF health services.

P134: Early Coagulopathy and Metabolic Acidosis Predict Transfusion of Packed Red Blood Cells in Pediatric Trauma Patients

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Introduction: Pediatric trauma patients make up a significant proportion of casualties in deployed operations. Military physicians may have less confidence identifying pediatric patients

in need of transfusion than the more familiar adult trauma patient. Severely injured pediatric trauma patients often present to hospital with coagulopathy and metabolic acidosis. These derangements are associated with poor outcomes but it is unclear to what degree they predict packed red blood cell (pRBC) transfusion.

Methodology: We retrospectively identified pediatric trauma patients from a Canadian level 1 trauma center from 2006 to 2013. Inclusion criteria were age less than 18 years, Injury Severity Score greater than 12, and pRBC transfusion within 24 hours of admission.

Results: We identified 96 pediatric trauma patients who underwent pRBC transfusion within 24 hours of presentation to hospital. On admission, 43% of these patients had one or more signs of coagulopathy and 81% had metabolic acidosis. Size of pRBC transfusion in the first 24 hours ranged from 3 to 177 mL/kg (mean 29 mL/kg) and nineteen patients (20%) underwent massive transfusion (>40 mL/kg in 24 hours). Univariate analysis indicated that size of pRBC transfusion was associated with initial base excess ($r=0.46$), international normalized ratio ($r=0.35$), partial thromboplastin time ($r=0.41$), fibrinogen ($r=0.46$), and BIG score (Base deficit, INR, Glasgow Coma Scale (GCS), $r=0.36$). Platelet count, age, GCS, and direct versus referred presentation were not predictive. Multivariable linear regression confirmed that coagulopathy and metabolic acidosis remained predictive after adjusting for direct versus referred presentation ($R^2=0.30$).

Conclusions: Early coagulopathy and metabolic acidosis predict size of pRBC transfusion among pediatric trauma patients. With further research these indicators could help guide early identification and transfusion of pediatric casualties.

P135: Constant Wear Aircrew Survival Immersion Glove Project

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Introduction: The design of Royal Canadian Air Force (RCAF) issued flight gloves increases fire and heat protection while providing mobility and control when performing daily and emergency flying tasks, but offers minimal protection against cold water. Emergency egress from an immersed aircraft in cold water requires the ability to overcome the loss of visual cues, numbness of the limbs, and loss of spatial orientation, all during a high level of arousal. The ability to perform emergency egress tasks and basic survival tasks depends on maintaining manual dexterity and tactile sensation in cold water. The objective of the project was to establish hand protection requirements to prevent manual impairment in cold water, which has a higher thermal conductivity than air (0.6 vs 0.025W/(m·K)), by evaluating military and civilian off-the-shelf handwear.

Methodology: Selection of potential Constant Wear Aircrew Survival Immersion Gloves (CWASIG) was based on a comprehensive review of Sea King aircrew work activities. Observations of emergency egress training and focus groups with crew members determined the required levels of manual dexterity and tactile sensitivity during the first minutes of cold water immersion. A study was then conducted in January 2015 with 14 participants from 12 Wing Shearwater. Participants performed the

ASTM F2010 pegboard test in a) dry condition and b) after arms immersed in cold water ($\approx 2^\circ\text{--}4^\circ\text{C}$) for 3 minutes. The tests were performed using commercial off the shelf/military off the shelf gloves and the RCAF in-service glove.

Results: The ASTM F2010 pegboard test results showed a statistically significant difference between dry and cold wet conditions as determined by one-way ANOVA, $F(4,65)=34.313$, $p\leq 0.001$ and $F(4,52)=30.114$, $p\leq 0.001$, respectively. A Tukey post-hoc test revealed that the Royal Norwegian Air Force Hestra glove allowed participants to complete the pegboard test significantly faster than the RCAF In-Service glove during cold water immersion ($p=0.033$). Other gloves tested showed good insulation and water permeability, but the extra protection was detrimental to dexterity and tactility. Results determined pros and cons of different glove fabric, textile, design and assembly pattern, mainly with regard to dexterity and insulation while exposed to cold water. Results also defined the baseline for future prototypes or procurement.

Conclusion: The physiological response to cold water immersion and the lack of proper protection for the aircrew pose a significant risk to survivability following a crash in cold water. Understanding work activities, constraints and cold water protection requirements are key to developing an improved glove for the Sea King community.

P136: Hair Follicle: A Novel System for Exploring Biomarkers in Military Operational Stress Disorders

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Introduction: Military personnel are commonly exposed to operational stressors (e.g., intense physical exertion, sleep deprivation, and fatigue) during both training activities and combat operations, which are often associated with mental health disorders, including depression and posttraumatic stress disorder. As psycho-physiological changes are driven by molecular mechanisms, it is useful to assess corresponding adaptations in gene expression profiles for a better understanding of such responses. Thus, we explored human hair follicles as a robust and accessible biomarker system for both characterization and diagnostic purposes.

Methodology: Four healthy male volunteers performed a 2-week period of high-intensity interval training (HIIT), as an easily quantifiable and reproducible physical stress model. RNA-sequencing was conducted on an Illumina MiSeq platform using the total RNA libraries prepared from the hair follicles collected from the vertex area of the scalp pre- and post-HIIT. The resulting RNA sequences were aligned to the human genome. Differential expression (DE) was analyzed for protein coding RNA (mRNA), miRNA, and long non-coding RNA (lncRNA). Gene ontology (GO) term analysis was also conducted.

Results: Based on the DE mRNA results, the GO term enrichment showed 192 positively affected terms (e.g., hormonal control), while 387 (e.g., immune system process) were negatively enriched upon HIIT. Regarding to miRNA, 48 related GO terms (e.g., antioxidant response) were enriched. We also identified

249 differentially expressed lncRNAs, including those involved in RNA processing (e.g., RMRP).

Conclusion: Overall, this study demonstrates that human hair follicles are a valuable resource in providing molecular signatures linked to operational stress disorders.

P137: From Theory to Practice: Personalized Application of R2MR Skills through Mobile Apps

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Brief Description: The Canadian Armed Forces (CAF) Road to Mental Readiness (R2MR) mental health training and education program includes strategies to manage the stress response and improve performance. Building on elements of similar programs, such as the United States Naval Special Warfare Command Mental Toughness program, the CAF has adopted four primary skills (goal setting, self-talk, mental rehearsal, and tactical breathing) with the recent addition of a fifth skill, attention control, for specific occupations and environments. The skills are taught in both the career and deployment training, tailored and adapted to the rank, task, occupation, environment or mission. Program evaluation conducted in collaboration with DRDC has demonstrated that repeated application and practice of the skills in the training environment improves retention and effectiveness. Mobile applications have therefore been developed to provide CAF personnel with the opportunity to customize each of the skills and apply what they have learned to a variety of potentially stressful demands in their lives.

Clinical Outcomes: After initial validation, the mobile applications will be integrated into R2MR training to reinforce application of the skills both in the classroom as well as in daily life. Mobile applications for goal-setting, self-talk, mental rehearsal, tactical breathing, attention control and memory will allow users to build personal scenarios to achieve objectives, while a mental health continuum application will allow individuals to monitor their own health behaviours and determine when additional resources may be required. The mobile applications can also be used as an adjunct to mental health treatment as they are based on cognitive behavioural theory. Integrated into existing mobile technology, users will be able to set reminders for each app and monitor their progress over time.

Patient Population: The mobile applications have been developed for a general CAF audience, but will be able to be customized for family members as well as non-military personnel.

Conclusion: Validation and evaluation of the mobile applications will provide insight into which skills are used most frequently, which skills may be more challenging to learn and apply, and whether or not the ability to customize skill application leads to improvements in performance or well-being.

6. Transition from Military to Civilian Life

Podium Presentations

2D02: Afghanistan Veterans

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Introduction: The Canadian Armed Forces (CAF) has participated in six operations in Afghanistan since 2001. Since then, the Department of National Defence (DND) has studied serving personnel after deployment, with a focus on mental health. This study followed personnel after release from the military, to examine the characteristics of those who have deployed in support of Afghanistan, both CAF serving members and Veterans.

Methodology: A cohort of 41,600 CAF members had an Afghanistan deployment from 31 January, 2001 to 31 March, 2013, as identified by DND operational data. This cohort was record linked with DND's casualty and release data, and Veterans Affairs Canada (VAC) program participation data. The cohort was also linked with 2010 survey data of Veterans (n=223) that included outcomes of adjustment to civilian life, self-reported health, activity limitations, chronic conditions, and employment.

Results: The majority (79%) of this cohort were still-serving in the military as of January 2013, and the other 21% were Afghanistan Veterans, released from the military. A small part of this cohort (4%) was reported as casualties and 13% were in receipt of VAC disability benefits related to Afghanistan. Afghanistan Veterans were more likely to report difficult adjustment to civilian life (34%, 95%CI 27.6-41.8) compared to other Veterans released from 1998 to 2007 (25%, 95%CI 23.1-26.3). Compared to other Veterans, Afghanistan Veterans had similar rates of very good or excellent health (56%), employment 12 months after release (56%), chronic physical condition (66%) and some activity limitation (56%). Afghanistan Veterans were more likely to report PTSD diagnosis (19%, 95%CI 14.5-24.8) compared to other Veterans (10%, 95%CI 9.5-11.3).

Conclusion: The majority of the Afghanistan cohort were still serving and has yet to transition to civilian life. Afghanistan Veterans were found to be worse off than other post-Korean War Veterans in the areas of adjustment to civilian life and mental health. Participation in VAC programs is expected to rise as more members release. These findings can inform strategic planning for VAC and DND. The Afghanistan cohort should be updated to reflect the last operation that ended in March 2014. Future studies could follow the Afghanistan cohort longitudinally as they release from the military and as they age, enabling evaluation of programs and services aimed at improving transition outcomes and supporting Veterans over the lifecourse.

2D04: Understanding Female Veterans of the CAF: A Synthesis of Findings from the Life After Service Studies 2010 and 2013

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MA, MacLean, MB., MA, VanTil, L., MSc (Epi)

Veterans Affairs Canada

Introduction: Females are an important but relatively understudied sub-set of the Canadian Veteran population. This knowledge gap is important to Veterans Affairs Canada (VAC) for policy and program design as there may be requirements to meet specific gender needs. VAC has collected considerable data on female Veterans and reported on findings as components of other reports. This project synthesizes the findings from the Life After Service Study (LASS) (2010 and 2013) to both describe what is known about female Veterans in Canada and to identify knowledge gaps requiring further study.

Methodology: LASS consists of an income study and a health survey. Together, they provide a wide range of variables related to income, health, wellbeing and socialization. For the income studies, Statistics Canada linked together DND records to the general family tax records. For the 2010 study, 36,638 records were linked for Regular Force Veterans who released from 1998 to 2007; for the 2013 study, 64,880 records were linked for Regular and Reserve Force Veterans who released from 1998 to 2011. For the health and wellness survey, the 2010 survey sampled 3,154 Regular Force Veterans released in 1998 to 2007, while the 2013 survey sampled 3,727 Regular and Reserve Force Veterans released in 1998 to 2012 and 2003 to 2012 respectively.

Results: The project provides an important demographic overview of this sub-population, identifying many characteristics of Canadian female Veterans and offering a comparison to the male Veteran population. Results indicate that female Veterans share many similarities with male Veterans, yet there are important differences in a number of areas. The findings would suggest that while males and females report similar rates of successful transition, female Veterans may have different issues affecting them as they transition from military to civilian life.

Conclusion: The synthesis provides important insights into the socioeconomics, military characteristics, health, disability and well-being of female Regular Force Veterans. Females share many similarities with their male counterparts but there are differences. While the findings provide important information for program and policy design, the results do not always provide an explanation as to why differences exist between male and female Veterans, indicating areas for further study.

2D05: Let's Focus the Labour-market Outcomes of Veterans

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Veterans Affairs Canada

Introduction: Employment is important in adjustment to civilian life. In fact, Veterans not employed were more likely to report difficulty adjusting to civilian life than those employed. The importance of employment in transition to civilian life is recognized in the New Veterans Charter (NVC) and Veterans Affairs Canada (VAC) is currently developing an Employment Strategy to improve the employment outcomes of Veterans.

Methods: This study examines how labour-market outcomes are measured in Canada, reviews the literature on Veteran labour-market outcomes in Canada and other countries and looks at Veteran labour-market outcome findings from the Life After

Service Studies (LASS).

Results: National surveys in Canada capture the dynamic nature of the labour force with people moving in and out of the labour-force and between employed and unemployed. Approaches to capturing these changes should be considered for future cycles of LASS. In Canada studies since the 1970s have found deficiencies in civilian employment programs, barriers to work among medically released Veterans, lack of preparedness for transition among younger, single and lower educated Veterans, highlighted the importance of education and found lower employment rates among older and female Veterans compared to other Canadians. In Canada today, Veteran labour-market outcomes appear to be quite positive. However, a higher proportion of Veterans are not participating in the labour force compared to Canadians, employment and work satisfaction rates are much lower in the year following release and the characteristics of unemployed and those not in the labour forces differ. Factors found to be associated with lower employment rates or lower earnings among Veterans include combat exposure, female gender, older age and lower education. For Veterans experiencing work disability, supported employment programs, benefits counselling and interventions to improve mental health, have been found to be effective. Several studies have found that work improves health and well-being and work disability is influenced by compensation, workplace, personal and health care systems.

Conclusions: Programs aimed at improving employment outcomes among Veterans need to clarify outcomes being sought. In Canada LASS provides a unique opportunity to establish benchmarks and measure these outcomes. For Veterans experiencing work disability, several effective interventions and best practices emerged including supported employment and more emphasis on work as a means of improving income as well as well-being. Further study is needed to understand barriers to employment and program reach and effectiveness.

3E02: If I am Not a Soldier, Who am I? Understanding the Transition from Military to Civilian Life through the Lens of Identity Research

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Introduction: Transitioning from military to civilian life poses significant identity challenges. Memberships in social groups (such as the military) are central to one's self-understandings and can provide individuals with purpose, meaning, feelings of competence and value. A challenge unique to disengagement from the military is that the cultural context of military life, the degree and nature of intragroup relationships, and the skills and expertise acquired have few parallels in civilian life. This makes the achievement of identity congruence especially difficult. In addition individuals transitioning from the military may need to simultaneously cope with the realities of combat and manage the associated physical and occupational stress injuries.

Two research studies that investigated the identity implications of disengagement from a variety of social groups (the military being one) were completed. The first study (2007) investigated voluntary disengagement, the second (2015) investigated

forced leavings. These studies had as their central aims: 1) to determine if a disengagement process exists, and if so to discover the defining characteristics and phenomenological aspects; 2) to describe the shifts in identity that accompany the disengagement process; and 3) to regard the clinical or treatment implications of disengagement.

Methodology: The two aforementioned studies were each qualitative studies using identical data gathering and analysis strategies. Each study had 16 participants, each of whom over the course of two interviews told their stories of membership and disengagement from a social group. Each story was transcribed and then analyzed using narrative analysis.

Results: The results were as follows: 1) social group disengagement emerged as a definable social process with an argument made that what we know about this broader phenomenon bears relevance to the specific transition from military to civilian life 2) the degree to which the associated identity-based challenges are acknowledged and addressed determine the trajectory of the individual's life post service, and 3) a good outcome includes the achievement of identity congruence and the exercise of personal agency.

Conclusion: Knowledge of disengagement processes and the associated identity implications can improve health professionals' abilities to help. Specific treatment goals should include the achievement of personal and social identity congruence, the maximization of a client's self-determination and his/her control of the disengagement process with respect to timing and pace, and the nurturance and facilitation of social supports.

3E03: Leading by Convening: Advancing Transition Research via a Translational Summit

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³Tuscaloosa VA Medical Center

Introduction: Researchers, policy makers, federal agencies, and other stakeholders have been slow in identifying and accepting the realities of being in frequent, oftentimes long-term, limited wars in multiple countries, including the impact on service members, veterans, and their families and communities. Service members face numerous changes in circumstances, from varied levels of preparedness to high levels of operational tempo to challenges of reunion/reintegration with their families, communities, employers, and schools. One of the significant barriers to better understanding this complex issue and translating that understanding to improvements in transitions back to civilian life is the silo mentality of the various stakeholders in the arena of military and veteran research.

Methodology: The authors will present a translational summit model being used to convene different stakeholder populations in the United States to advance translational research on the transition from military to civilian life. The *Service Member to Civilian (S2C) Summit*, which is supported by the National Institutes of Health, brings together stakeholders from across the United States to address current and emerging needs of service members transitioning to civilian life. Held in 2015 and scheduled again for 2016, S2C facilitates the examination of how service

members transition to civilian life and how that transition can be better understood and improved through translational science and service. S2C brought together 220 individuals from diverse backgrounds to better understand/explore how to improve the transitions. The objectives were to: 1) present current research and best practices for improving military to civilian transitions; 2) build research and practice consortiums that bring service members, veterans, and families together with researchers, clinicians and decision makers, civilian employers, researchers, students, and higher education leaders; 3) articulate short-term and long-term translational research and practice agendas; 4) expand the role of higher education in improving transitions; and 5) identify emerging research and program leaders.

Results: The authors will present the S2C model and discuss challenges and issues to convening the summit. They will also present qualitative data from collaborative sessions at the summit and feedback from the S2C evaluations and individual participant feedback. Finally, they will discuss progress toward summit objectives.

Conclusion: Feedback from the 2015 S2C participants and the expansion of involved stakeholders in the 2016 summit shows the translational summit model was successful in advancing the national discussion of how to improve transitions. The authors will present lessons about how to hold a translational summit and suggestions for transition research and programs.

3E04: The Determinants of a Successful Transition from Military to Civilian Life

Squire, S., MHK

Office of the Veterans Ombudsman

Introduction: The Department of National Defence (DND)/Canadian Armed Forces (CAF) and the Veterans Ombudsmen are conducting a joint systemic review of the transition process from military to civilian life for medically releasing CAF members. The primary objective of the review is to identify issues and produce recommendations aimed at harmonizing the transition from military to civilian life for medically released CAF members. Preliminary findings have identified that there is no established or commonly accepted definition of a successful transition from military to civilian life in the Canadian context. A common definition is essential to ensure policies, processes, programs and services are in place to achieve a successful transition and monitor the outcomes on a continuous basis. This qualitative study was conducted to assist in defining the determinants of successful transition outcomes for medically released CAF members.

Methodology: A qualitative interview format and assessment matrix tailored to Veterans who were medically released from the CAF, based on current research and the Office of the Veteran's Ombudsman's objectives was used. The interview questions work within the following framework: (a) Health. Adaptation to Mental or physical health problems (not just OSIs); (b) Ability/disability - Veterans with impairments related to physical and mental health conditions may have difficulty participating in life roles at work, school and/or in the community; (c) Employment - As most Veterans work or are of working age, employment is critical for financial autonomy, stability and meaning of life; (d) Income and financial well-being - Income levels after release decrease especially if adjusting to chronic mental and physical health injuries and conditions; and (e) Family - Families play a

central role in the transition process. The interview questions and responses also identify what in the transition process facilitated a successful transition including: (a) Developing goals and plans; (b) Military culture; (c) Benefits and programs; (d) Client service satisfaction and service delivery; (e) Defining the start and end points of transition; (f) Technology tools as social media and the internet; (g) Timeliness, availability and effectiveness of information; (h) Availability and knowledgeable DND/CAF and Veterans Affairs Canada client service support staff; and (i) Availability of community resources.

Results: Preliminary results are not yet available.

Conclusion: The results of this study will provide a preliminary understanding of the determinants of a successful transition and provide a better understanding of the impact and importance of both health factors and the transition process on achieving a successful transition.

3F02: The Cost of Caring for Canada's Disabled Veterans

Malanik, C., MA, Barkel, E., MBA

Parliamentary Budget Office

Introduction: Reports from the Veterans and the National Defence and Canadian Forces Ombudsmen have questioned the efficiency and sufficiency of the care and financial support being provided to Canada's Veterans through the New Veterans Charter (NVC). More recently, the Auditor General published a report citing that "improvements are required to specific New Veterans Charter programs to help Veterans and their families successfully transition to civilian life."

The government responded to these criticisms in Budget 2015 with a number of "enhancements" to the NVC. However, there are no estimates of the actual financial resources required to meet these obligations.

We address part of this research gap by leveraging actuarial work done by the Office of the Veterans Ombudsman (OVO) and data obtained from Veterans Affairs Canada (VAC) to provide an estimate of the economic compensation provided to disabled Veterans, including those of the Afghanistan conflict. We discuss how this model can be used to estimate the needs of future Veterans.

This presentation builds on a preliminary research study presented at the 2014 MVHR Forum.

Methodology: Following the presentation of our preliminary research findings at the 2014 MVHR Forum, OVO offered to share the actuarial tool used for the report titled: *Improving the Veterans Charter*. We determined that the tool could be scaled to project the long-term costs provided that we could obtain a suitable source of demographic data.

Using data obtained from Veterans Affairs Canada, PBO created population models for the years 2013 to 2024. The initial 2013 population represents the 2013 disabled Veterans receiving an NVC benefit. Using information from various sources, the remaining population-years reflect new-entry disabled Veterans bearing the anticipated characteristics of future disabled Veterans. By feeding these population-year observations into the OVO model, we were able to calculate an aggregate NVC cost.

Results: Consistent with the mandate of the PBO, the aim of this

research is to provide parliamentarians with financial analysis to inform their decision making with respect to the budgets and estimates concerning National Defence, Veterans Affairs, and well as Health Transfers. Research is in progress. We anticipate preliminary results to show reliable cost estimates of disabled Veterans receiving NVC benefits.

Conclusion: We conclude by proposing a model to integrate the Department of National Defence health data with VAC actuarial data in order to better anticipate the future needs of Canada's Veterans. Our study in this area is at a preliminary stage and may form the basis of future research.

3F04: Comparison of Drug Benefits Provided to Veterans and CAF Personnel

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⁵Veterans Affairs Canada

Introduction: Individuals with Canadian military service are eligible to receive medications from two federally funded programs: while on active duty, their drug benefits are coordinated by the Canadian Forces Health Services Group (CF H Svcs Gp), but following release, drug coverage is provided through Veterans Affairs Canada (VAC). Mismatches in the medications covered by these two programs could increase the risk of treatment discontinuation upon transition, with consequent harms to health. A systematic comparison of drug benefits was therefore performed to determine if discrepancies exist in the types of medications covered by the (CF H Svcs Gp) and VAC.

Methodology: Detailed listings of the drug benefit items covered by the (CF H Svcs Gp) and by VAC were obtained from their third-party claims adjudicator (Medavie Blue Cross). A condensed drug benefit set (formulary) was created for each program, which included all medications covered without restrictions (Regular Benefits) and those medications whose coverage is subject to limitations defined by the program (Special Authorization drugs). Medications designated for provision on a temporary basis only (Interim Supply List) were excluded from analysis.

Drug benefit items for both programs were then classified using the Anatomical Therapeutic Chemical (ATC) classification system of the World Health Organization. Drug classes were defined using 2nd-level ATC headings, while medicinal agents were defined using 5th level headings. A new measure – ATC concordance – was calculated for each therapeutic class, to indicate the percentage of identified medications that were covered in common by both the (CF H Svcs Gp) and VAC programs. Drug classes with low ATC concordance or which have risks associated with treatment interruption were investigated further.

Results: The consolidated formularies for the (CF H Svcs Gp) and VAC programs contained 10,743 and 12,274 drug products, respectively. These were distributed across 80 different therapeutic categories. Eleven classes (13.8%) were covered identically by both programs, while six were covered by just one (4 by (CF H Svcs Gp), 2 by VAC). ATC concordance within the remaining 63 therapeutic classes ranged from 13.3% to 95%. Further investigation of listing mismatches was conducted in 35 categories. In

most cases, discordant listing could be attributed to differences in program mandates (e.g., (CF H Svcs Gp) coverage of products used in deployed hospital settings).

Conclusion: Overall, the (CF H Svcs Gp) and VAC drug benefit programs offer a comparable range of products to their clients. Discrepant listings will be reviewed further by individual programs. In future, closer alignment of the (CF H Svcs Gp) and VAC formulary review processes may further reduce the variability in drug coverage for clients.

5A01: If They Only Knew: Public Perceptions of CAF Veterans' Military to Civilian Transition Experiences

Black, T., PhD, Meikle, N., BA, MA (Student), Heshmat, G., MA

University of Victoria

Introduction: Dr. Black's research program at the University of Victoria has focused on the transition experiences of Canadian Armed Forces (CAF) Veterans. Part of a federally funded research grant from the Social Sciences and Humanities Research Council, the current research builds on a national online survey conducted by Dr. Black (Black and Papile, 2010) wherein Veterans who were surveyed indicated that their transition would have been easier if the public knew more about the military way of life. As such, Dr. Black and his research team will present data from their most current survey of individuals in the public regarding their perceptions of CAF Veterans' transition experiences.

Methodology: The current study employed in-person, street-level, structured interviews with members of the public who met the inclusion criteria for the study. 100 individuals from multiple research sites across the Greater Victoria region were interviewed to assess their knowledge of the issues the Veterans face and struggle with in their transition to civilian life. Participants were deemed eligible only if they reported having no first-degree relatives or first-hand involvement with the Canadian military. Descriptive statistics will be presented in the context of previous research conducted by Dr. Black on military to civilian transition experiences for CAF Veterans.

Results: Preliminary analysis of data indicates that the majority of surveyed participants view Post-traumatic Stress Disorder (PTSD) and overseas deployment as the biggest struggles impacting Veterans in their transition to civilian life. Participants perceive family struggles and unemployment as the most immediate issues in transition, while they perceive military memories as the most common issue Veterans face in the years of transition that follow the end of their military careers. The majority of participants surveyed were 'neutral' when asked if suicide was the biggest issue facing Veterans in transition.

Conclusion: The exploratory nature of this survey prevents any firm conclusions from being drawn but findings seem to indicate that the public's perceptions were not entirely inaccurate, when compared to available government and non-government research. However, many perceptions are not firmly rooted in available data and that there are considerable gaps in understanding when it comes to Veterans and the transition issues they face when leaving the military. The findings indicate that there is much work to be done to help the public understand more about the struggles that Veterans in transition must overcome.

5A02: Feeling Like Your Best Days are Behind You: Developing a Concept of Transitional Injury

Rose, S., PhD

Queen's University; Canadian Institute for Military and Veteran Health Research

Introduction: The vast majority of research on suicide among Veterans focuses on the impact of mental disorders such as Post-traumatic Stress and Major Depressive Disorders, resulting from traumas incurred on deployment. Discussions of difficult social transitions run parallel to this research on suicide. The social transition research focuses on the negative effect of losing one's tightly formed communal bonds when leaving the military (Black and Papile, 2010). In addition, Veteran Affairs Canada's Life After Service Studies (2014) have found that compared to the general Canadian population, Regular Force Veterans are less likely to have a sense of community belonging and are less often satisfied with life. My findings connect the literature on suicide with research on issues related to social belonging during transition. A concept of transitional injury is developed to bridge this gap and build on current understandings of suicidal ideation among Veterans.

Methodology: This research employs semi-structured qualitative in-depth interviews with 35 Canadian male Veterans who deployed to Afghanistan. The interviews inquire into the individuals' experiences in training, on deployment, in transition, and their current situation. Following the interviews, a thematic analysis was conducted to understand the major social barriers individuals face as they transition into civilian occupations and family life. The interpersonal conditions related to instances of suicidal ideation are analyzed in reference to Thomas Joiner's two-factor model of suicidal desire: thwarted belongingness and perceived burdensomeness.

Results: Six themes emerge from the interview data: missing the military; feeling lost and apathetic in civilian life; feeling cut off from an elite family; difficulty connecting with civilians; the loss of structure; and the loss of a sense of service. Suicidal desire is related to strong manifestations of one or more of these interpersonal conditions.

Conclusion: Beyond the impact of Post-traumatic Stress Disorder and Major Depressive Disorder, Veterans who had the most difficult transitions experienced transitional injuries that affected their interpersonal social relations, contributing to suicidal desire. This research demonstrates that although Veterans' concerns have a great deal in common with Joiner's thwarted belongingness factor, there is also a moral element to these concerns that goes beyond a sense of loneliness. The sense of being lost, apathetic, and missing the responsibility found through military service illustrates the need to recognize transitional injuries resulting from a cultural disjunction. Lastly, this research highlights the positive elements of current social transition programs that assist Canadian Veterans.

Poster Presentations

P138: Homeless Veterans

Darte, K., MN, Morrison, M., BSW, MSc, Ross, D., PhD

Veterans Affairs Canada

Introduction: Homelessness is characterized by the instability of housing and a combination of inadequate income, health care supports and/or social supports. Veterans Affairs Canada (VAC) has been a partner in several studies of homelessness that include Veterans. Most homeless Veterans are similar to other homeless Canadians. This study provides findings from the evaluation of a demonstration project to provide transitional housing and support services to homeless Veterans in four Canadian cities.

Methodology: VAC partnered with Employment and Social Development Canada and local non-profit agencies in Victoria, Calgary, London and Toronto to provide housing for 78 Veterans with a history of homelessness. Veterans were assigned to a local VAC case manager for assistance and support regarding service-related benefits, and a clinician through the Operational Stress Injury Clinic (OSIC) for assessments and treatment/referral for mental health, addictions or other health concerns.

Results: Participants had been homeless for an average of 10 years, were 92% male and age range was 48% aged 50-59; 37% <50; 15% >60. They had an average of 8 years of service in the Canadian Armed Forces (73% Regular Force; 27% Reserve Force) and had been released from military service for 28 years.

Case managers noted the complex needs of the participating Veterans, with physical and mental health needs, as well as street entrenchment. Contact with OSIC personnel found that the majority had mental health and/or addiction issues. These Veterans were isolated, mistrustful and had multiple socio-economic barriers. For many, it required the full two-year study period to establish basic rapport, trust and relationships necessary for effective assessment.

Conclusion: Housing first with support services that vary according to need has proven effective for homeless Veterans. Interaction between homeless Veterans and OSIC clinicians demonstrated the importance of addressing mental health and/or addiction issues for those transitioning from homelessness to housing and towards improved self-reliance and sustainability in the long-term.

P139: Building a Profile of CAF Members who were Deployed in Support of Afghanistan

MacLean, M.B., MA, Campbell, L., BPR, Van Til, L., MSc (Epi), Poirier, A., McKinnon, K., Pedlar, D., PhD

Veterans Affairs Canada

Introduction: The Canadian Armed Forces (CAF) began operations in Afghanistan in October 2001. Since then, the CAF has participated in six operations. The last operation ended in March 2014. This poster describes the data sources and record linkages involved in building a profile of CAF members who were deployed in support of Afghanistan up to March 2013.

Methodology: Three groups were derived from the Department of National Defence (DND) and Veterans Affairs Canada

(VAC) administrative data: (1) all who served from 2001 to March 31, 2013; (2) those who became casualties; and (3) VAC clients in receipt of disability benefits. The cohort was derived from an extract of the Afghanistan mission from the Canadian Forces Task Plans and Operations (CFTPO) system. Casualty information came from a VAC casualty notifications dataset fed by casualty notifications from DND's Casualty Reporting System. The cohort records were linked to VAC administrative data on contact with VAC client status. Data from the 2010 Survey on Transition to Civilian Life was also record linked. Records were also linked to DND data on serving status.

Results: The CFTPO dataset included 62,842 records of deployments to six operations. After certain exclusions, 59,246 deployment records remained representing a population of 41,600 unique members and Veterans deployed from January 31, 2001 to March 31, 2013. The VAC casualty notification system contained 3,137 records occurring in Canada and elsewhere from January 2002 to February 27, 2013. Of these, 1,772 personnel were reported to VAC as casualties in Afghanistan. The dataset on contact with VAC contained 805,950 records as of May 7, 2013. The dataset on serving status contained all members serving as of January 4, 2013 (N= 98,319). The Life After Service Studies (LASS) 2010 Survey on Transition to Civilian life included a sample of 223 who served in support of Afghanistan representing an estimated weighted population of 7% of the survey population.

Conclusion: CAF has participated in six operations in Afghanistan since it began in 2001. As of March 2013, almost 42,000 CAF personnel have deployed in support of the Afghanistan mission. Of these, 4% became casualties, 13% were in receipt of disability benefits related to an illness/injury sustained in Afghanistan, 79% were still serving and 49% had contact with VAC. As the last operation ended in March 2014, a nominal roll for Afghanistan should be completed. VAC and DND have started this process.

P140: Therapeutic Experiences and Perceived Social Support: Evaluating Change Processes in Canadian Veterans Following Group Interventions

Owen, J., BA, Cox, D., PhD

University of British Columbia

Introduction: While several studies have examined what facilitates military Veterans' transition to civilian life, few have looked at the therapeutic change processes, and none have evaluated the relationship between Veterans' therapeutic experiences and perceived social support following group interventions. Therapeutic experiences are represented by four themes: secure emotional expression, instillation of hope, awareness of relational impact, and social learning. The purpose of this study was to evaluate changes in Canadian Veterans' perceived social support in relation to therapeutic experiences following completion of a peer-based, retreat-style group program.

Methodology: Participants include Canadian Veterans who completed the Veterans Transition Program (VTP), a multimodal group designed to facilitate transition to civilian life via peer support, psychoeducation, emotion regulation skills training, re-enacting traumatic events, reducing barriers to care, and identifying and working on future goals. Veterans (N = 100) completed

assessments just prior to and just following participation in the program, and ranged in age from 23 to 64 years. All of the participants had experienced a traumatic event in their lifetime, including military combat (51.7%), childhood abuse (38%), adult domestic violence (31.5%), and others. Presently, we evaluated how Veterans' therapeutic experiences in the group predicted changes in social support in Canadian Veterans just before and just after participation in the VTP.

Results: Preliminary results show a statistically significant increase in perceived social support from pre- to post-program and that different therapeutic factors differentially influence changes in social support. A series of moderation analyses will be run to determine which therapeutic factors most facilitate improvement in social support.

Conclusion: While social support has widely been substantiated as important for a number of positive outcomes—including military to civilian transition—there is a paucity of research evaluating which group-based change processes facilitate social support. The present studies' identification of the most important change processes can be used to inform practitioners and researchers on what to target in their interventions for military members transitioning to civilian life.

P141: Mining the Data in the Life After Service Studies

Poirier, A.

Veterans Affairs Canada

Introduction: The Life After Service Studies (LASS) program of research is designed to enhance better understanding of the transition from military to civilian life and ultimately improve the health of Veterans in Canada. LASS partners are Veterans Affairs Canada (VAC), the Department of National Defence / Canadian Armed Forces (DND/CAF) and Statistics Canada. Recently, the 2010 and 2013 survey master data file was placed in Statistics Canada's Resource Data Centres (RDCs). An enhanced dataset with record linkages to various DND and VAC administrative data has been created. This poster is an interactive, live demonstration of the potential uses of this enhanced dataset.

Methods: The survey included three Veteran subgroups: Regular Force released 1998 – 2012, Primary Reserve (Class A/B & C released 2003 – 2013). The LASS 2013 survey was a computer-assisted telephone interview conducted by Statistics Canada in March 2013 with a representative sample of Regular and Reserve Force Veterans. The survey included a question asking for permission to record link respondents' survey responses with VAC and/or DND administrative data. The RDCs have a survey master file which includes data for those who agreed as well as those who did not agree to share. VAC/DND have developed an enhanced dataset that includes those who agreed to share with additional analytical variables as well as DND/VAC administrative data added through record linkage. This data is anonymized and protected under section 12 of the Statistics Canada Act. This VAC/DND enhanced dataset will be available for querying based on subject matter and points of interest chosen by visitors to the poster.

Results: The study population included 56,129 Regular Force Veterans and 20,169 Reserve Force Veterans. The survey had a 70% response rate, and 90% agreed to share their data with VAC

and DND resulting in a share data sample of 3,727 Regular and Reserve Force Veterans. Topics for investigation include service, demographic and VAC program participation characteristics and indicators of health, disability and determinants of health such as low income, unemployment and level of social support.

Conclusions: This interactive poster highlights the potential uses of the enhanced survey dataset for researchers, policy analysts, stakeholders and program administrators in their specific areas of interest. This rich dataset can answer many questions about the well-being of recently released CAF Veterans. Researchers can work with the master file now in RDCs across the country, but can also work with VAC and DND in making full use of this enhanced share dataset.

P142: Transition of Drug Benefit Coverage for Medically Releasing Personnel Serving in the CAF

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¹Canadian Forces Health Services Group; ²University of Ottawa

Brief Description: Transition of patients between care delivery teams can risk disruption of existing drug therapy, and contribute to medication incidents. For personnel in the Canadian Armed Forces (CAF) who have complex medical conditions incompatible with ongoing military service, transition to the civilian health care system can introduce new complexities, particularly around drug therapy. Although such individuals will receive comprehensive drug coverage from the Canadian Forces Health Services Group (CF H Svcs Gp) while serving, upon release, their drug coverage will be provided through a combination of enrollment-based programs and/or publicly funded drug plans. To ensure that CAF personnel with known health conditions can maintain uninterrupted drug coverage upon transition to civilian life, the CF H Svcs Gp has implemented a program that explains alternative coverage options, and facilitates advance review of drug therapy regimens through Veterans Affairs Canada (VAC).

Clinical Outcomes: During the past 5 years, this program has noted an increase over 75% in the number of CAF personnel undergoing medical release. Almost all individuals processed through this program receive one or more medications during the year prior to their release, which highlights the significant potential for interruption in care upon transition to civilian life. The program continues to receive a limited number of calls from members, including some from released personnel.

Patient Population: This program is offered to CAF personnel who have been serving full-time in the CAF, and who are concluding their military careers due to health limitations incurred during service (aka "medically releasing" personnel). These individuals are eligible to receive selected drug benefits from VAC for their pensionable condition, and also have the option of enrolling in the Public Service Health Care Plan for supplemental drug coverage following release.

Conclusion: The current program for transitioning of drug coverage among medically releasing CAF personnel appears to be addressing most members' needs. However, based on a limited number of calls received to date, some individuals may continue to encounter challenges in accessing drug benefits following their release from the CAF. Investigation of alternate drug coverage options should be considered whenever a CAF

member is contemplating release while receiving ongoing medical treatment.

P143: The Way Forward – Transitional Life Skills for Retiring Military Members and their Families

Pearce, D., PO2 (Ret'd), MET, Mazerolle, K., MA, Rothwell, M., MAA, Wilm, A., MEd

Lakeland College

Brief Description: Adjusting from military service to “Civvy Street” can be both exciting and challenging. The Way Forward is a Lakeland College initiative to develop a series of online resources to be used as tools to assist military members and their families who are in the process of leaving the forces.

Clinical Outcomes: The resources will be presented as a free to user Massive Open Online Course (MOOC) with continuous enrolment. There will be 7 modules presented in both official languages. Accessing these resources will assist the member and family in adapting to the many changes that can occur after leaving the military. An example is Culture Shock which can be found in all environments – member has full medical and access to doctors in the military; on Civilian Street the member must look for a doctor who will take the member on as a patient. We will be assessing and modifying the course content based on participant feedback on an ongoing basis to determine the impact of the program on the development of transitional life skills.

Patient Population: The population served will be members and their families leaving the military life and resuming their roles in the civilian world. This initiative would also be available to assist those members who have been out of the military and continue to have difficulty adjusting to civilian life. We are actively recruiting mentors through the Royal Canadian Legion to add a face-to-face component to the online modules.

Conclusion: Returning to civilian life presents new opportunities as well as challenges for members and their families. Our initiative would assist members in transitioning and focus on building on their strengths. Lakeland College is committed to the development of this initiative as a way of building capacity by sharing our expertise with the military community posted anywhere in the world and in both official languages.

P144: Shaping Purpose® Program on Military and Youth

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Brief Description: Being released from the Canadian Armed Forces (CAF) can lead to feelings of isolation, loss of identity, loss of self-confidence and self-esteem and can lead to a variety of mental health concerns. Since CAF members may have little experience with the civilian world they can find themselves questioning their experience, transference of skills and may find themselves lacking interest in any specific field of work. The *Shaping Purpose®* Program helps individuals identify core Gifts, Passions and Values (GPVs). It then guides individuals towards improving their sense of well-being and finding their purpose

in life. Stated goals written in individual Life Plans created by the participants help them chart their own path in the transition in order to lead a happier and more successful post-CAF life. Once GPVs have been identified; *Shaping Purpose®* guides participants in identifying financial, geographical, medical, biological, social and professional considerations. Individuals are then shown how they can recognize situations, circumstances and opportunities that are in-line with their GPVs thereby allowing them to pursue their interests in a manner that they feel is fulfilling and rewarding. The program culminates with the documentation of an individual's purpose in life and the development of a Life Plan that can be revisited and revised changes to their situation occur over time. The *Shaping Purpose®* program supports and enhances existing Career Transition Assistance Programs currently provided by the CAF and VAC.

Clinical Outcomes: The Ryff Scales of Psychological Well-being and the Purpose in Life Test (PIL) were used to determine success of the program. Changes in PIL scores were significant from pre- to post-workshop, $t_{(20)} = -5.337$, $p = .000$. There were also significant changes from pre- to post-workshop in all RYFF subscales.

Patient Population: Participants were medical 3B releasing or released members in good standing with the CAF.

Conclusion: Due to a small sample size, caution should be used when interpreting outcomes. However, the *Shaping Purpose®* program shows a strong trend towards improving psychological well-being. It is possible that existing transition resources could be enhanced by first having members clarify life purpose and create a life plan designed to help them live their ideal life.

7. The Ethics of Health Care

Podium Presentations

1E01: Spirituality in the New Zealand Defence Force: Padres Tell their Story

Hill, E., Egan, R., PhD, McBride, D., PhD

University of Otago

Introduction: The role of the Padre in the New Zealand Defence Force has not been well understood, but they are essentially ‘men of faith’ who have a caring role in a deeply secular society. This qualitative project looked at how they define spirituality and what challenges they face in their role.

Methodology: A semi structured qualitative telephone interview with 11 Padres to determine how spiritual needs were defined, perceived and met from several perspectives: from their own personal convictions, from the padre-client relationship and from being a member of the Defence Force. The interviews were recorded, transcribed and analysed thematically.

Results: Some of the major spirituality themes to emerge acknowledged the significant Maori belief in spiritual connection and an overall acceptance of the Judeo-Christian traditions and rituals that come to make up military protocol. This was balanced by a global theme that emerged: their job was holistic and primarily relational, with all needs considered valid, not just ‘spiritual’ ones. The approach to understanding needs in general

did not discriminate which were 'spiritual' and which 'non-spiritual'. Their approach was one that ministered to the whole person and not to make any distinction between their own labels of faith, non-faith, gender identity or ethnicity.

The unique personal challenge to faith and spirituality was the need to train for, and possibly apply, lethal force, implying a willingness to kill another human being as 'part of the job'. This presents a fundamental moral dilemma to those of the Christian Faith. The chaplaincy team are a part of the Defence health and welfare system, in which sense they possess specific counselling, support and education skills. They work with health colleagues in a mutually supportive manner, particularly around stress and critical incident management, involved in educational briefs and critical incident debriefing. Some 'medical' decisions, particularly those concerning psychological problems, may not benefit the patient, so Soldiers often visit the Padre before going to the medical centre. There is a sense of 'off the record' to these conversations, that provides personnel with reassurance that no personal harm, or harm to others, will result.

Conclusion: In summary, Padres are capable of taking a pragmatic view: their role in life is not isolated to addressing the 'spiritual' but addresses the interconnectedness of the spiritual issue with our psychological complexity. This pragmatic, but deeply spiritual, worldview epitomises how healthcare, in its very best ideal, could be addressed. It identifies the 'what needs fixing' and specialises in taking all areas into account.

1E02: The Influence of Military Culture on Coping Mechanisms in Theatre and Associated Moral Injuries during Repatriation Based on Testimonies from Combat Missions: Underreporting and the Requirement for Mandatory Post-deployment Training

Moore, M.P., Lt(N), MA, Belanger, S.A.H., LCdr, PhD

Royal Military College of Canada

Introduction: This study will explore the influence of the Canadian Armed Forces' (CAF) unique combat-focused culture on soldier identity and coping mechanisms employed in theatre and during repatriation. The significant role of military ethics within the military culture requires soldiers to constantly analyze their environments to address the abundance of ethical dilemmas present in theatre. As members repatriate, there is a tendency to face their transition challenges with the same survival tactics applied in theatre. However, the shared characteristics of these military culture traits related to moral injury, with Post-traumatic stress disorder (PTSD) symptoms hinder the members' ability to identify their difficulties and as a result, to seek help and successfully reintegrate. Without enforced and effective post-deployment training that assists soldiers in identifying and overcoming these difficulties, soldiers face moral and stress injuries unprepared.

Methodology: A comprehensive literature review was used to identify key relationships between military culture, moral injuries and PTSD symptoms. The findings from the literature reviews were tested against testimonies of CAF soldiers deployed to various combat missions. The testimonies serve as first-hand evidence of the influences of military culture on coping mechanisms used in theatre and repatriation. The analysis of these

testimonies focused on the specific discourses used to discuss survival in theatre, ethical dilemmas, transition out of theatre, and daily functioning in work, social, and family environments.

Results: It was found that certain cultural traits become engrained into soldier's reactions and assessments of their combat environments. Although soldiers are equipped to confront ethical dilemmas in theatre, they are less prepared for the resulting moral injuries and associated reintegration issues when returning home. The military-specific cultural traits employed in theatre are not tailored to combat the long-term emotional, psychological, behavioural and social implications but rather hinder the members' ability to recognize these issues. Soldiers struggled to identify and define their difficulties, often unaware that their moral injuries were inhibiting a healthy reintegration.

Conclusion: Please describe the conclusions you are making for practice, policy or recommendations for future research based on findings to date.

According to the testimonial self-reports, the correlations between military culture's traits for survival in theatre and the similar PTSD symptoms ultimately decreased the member's ability to recognize their difficulties and cope with their adjustment into civilian society post-deployment. This study revealed the prevalence of moral injuries in soldiers from various operational tours. The topic of moral injuries needs to be included in readiness training for all members prior to deployment and while returning from deployments to ensure they are adequately prepared to deal with these prevalent issues.

1E03: Moral Injuries and Military Operations: Key Considerations for the CAF

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Introduction: Canadian Armed Forces (CAF) mental health data suggests that approximately 14% of CAF personnel who had been deployed to Afghanistan had a mental health disorder that was linked to that mission (Boulous & Zamorski, 2013). This paper focuses on a particular psychological aftermath of military operations, that which may be associated with the moral and ethical challenges that personnel face in military missions. This paper provides an introduction to the concept of moral injury, formally defined as the psychological anguish that can result from "[p]erpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations (Litz et al., 2014, p. 697).

Methodology: Key theoretical and empirical findings in moral injury scientific literature are reviewed and synthesized.

Results: Empirical evidence confirms theoretical discussions concerning moral injury. First, various studies show that military personnel confront a range of moral challenges in the course of military operations. Second, how these operational moral challenges are processed can lead to moral injuries, which in turn, are associated with a wide range of damaging psychological, interpersonal, occupational and life threatening outcomes for military personnel. Current treatment approaches are also outlined and implications for the CAF are discussed.

Conclusion: The moral complexity and ambiguity of the fu-

ture security environment is expected to increase. Therefore, addressing the potential for moral injury, while politically and legally sensitive, is an important consideration for targeted integration in future military training, mental health support and post-deployment treatment. A collaborative, international research program should be undertaken to inform evidence-based policy, training and treatment decisions by the CAF.

1E04: A Qualitative Study to Explore Medical Ethical Dilemmas Faced by British Military Senior Clinicians on Operations in Afghanistan

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Introduction: The ethical issues that arise for senior clinicians on deployment can be extremely complex. This study builds on recent research suggesting that participants relied on experience gained during previous deployments to make ethical decisions. Clinicians may not be able to rely on previous experience in future deployments, which may be very different to those already undertaken as the humanitarian deployment to Sierra Leone to assist with the Ebola Virus Disease has exemplified. This study aims to identify the major medical ethical dilemmas that confronted senior clinicians serving in the British Field hospital in Camp Bastion, Afghanistan. It explores what the most challenging ethical decisions were to resolve and the factors that made them ethically difficult.

Methodology: A 2-phase qualitative research study with a purposive sample of senior clinicians who have deployed to the British Field hospital in Camp Bastion, Afghanistan between 2009 and 2014. Phase 1: Analysis of vignettes of case studies that raised ethical issues. This informed the topic guide for Phase 2. Participants were invited to review and comment on the themes identified. Phase 2: Focus groups are being convened to explore the ethical issues that participants faced and to discuss how they think they can be best supported in their ethical decision-making, including what training would help them to be better prepared to address ethical issues in the future. Data collection is in progress, the study will be completed by late summer 2015.

Results: Themes include the impact of the Medical Rules of Eligibility (MRE) on whether a clinical decision becomes an ethical one, dual role conflicts, indigenous contextual and cultural factors, working with other nationalities, lack of military intelligence about local services, the importance of pre-deployment training which should be with the multinational team and using an ethical framework is helpful. Caring for children and pregnant women continues to generate emotive debate.

Conclusion: Pre-deployment training must include all the members of the multi-national team that are to deploy together to develop working relationships and to understand each other's cultural and ethical values. The clinical team should be given the opportunity during and post deployment to reflect upon the ethical dilemmas that they have faced. Ethical dilemmas arise from: working with other nations, a lack of medical

intelligence, working within a different cultural context. Making ethical decisions can have a psychological impact on the clinician involved.

1E05: Managing the Military Medical Ethics Issues that Arose during Deployment to "Fight" Ebola: UK Experience in Sierra Leone

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Introduction: UK Defence Medical Services (DMS) deployed to Sierra Leone in October 2015 to staff a treatment unit for Ebola-infected healthcare workers. We aimed to explore the ethical challenges they faced with a view to improving training and future readiness for similar humanitarian-driven deployments.

Methodology: We will collect and analyse interview data from ≥ 25 participants (doctors, nurses and allied workers) who deployed to the DMS Ebola treatment unit. Our interviews were informed by: previous related studies of civilian humanitarian healthcare workers, ethics literature on military healthcare and humanitarian/disaster responses, and five interviews with key informants who provided operational background and information related to the anticipated ethical challenges. Analysis will be completed in two stages. First, key issues are being identified alongside data collection to create ethics training materials. A second, more detailed qualitative analysis will be combined with robust ethical reflection to produce a detailed exploration of the experiences shared. The latter will be informed by empirical bioethics methodology. At present ten interviews have been undertaken. Data collection and analysis will be completed by the end of August 2015.

Results: Our preliminary findings suggest that the perceived ethical challenges that arose during operational planning were distinct from but nonetheless influenced those that were experienced on deployment. The key informants had struggled with, and wanted to talk about, their own ethical experiences related to strategic planning and the training that took place prior to deployment. This was unanticipated. Some key informants and all participants experienced the operation as being one that was highly politicised, and one where medical judgement and experience was not sufficiently influential. The rules of eligibility were controversial, and a significant source of ethical tension and, in some cases, moral distress. Participants were positive about the practical training and preparation received/given, and its success helped to allay ethical concerns related to risk (itself a significant theme). The participants have thus far self-categorised as "volunteers" rather than deploying "under orders" and felt that this meant they experienced the issues (including in relation to risk) differently.

Conclusion: Based on findings to date, one conclusion is likely to be that there needs to be greater sensitivity to the ethical challenges confronting military medical personnel both within the non-medical chain of command and at a high political level if moral distress amongst those who deploy, and those who supervise their deployment, is to be minimised.



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