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ABSTRACTS/RÉSUMÉS

The 7th annual conference of the Canadian Institute for Military and Veteran Health Research
La 7ème conférence annuelle de l'Institut canadien de recherche sur la santé des militaires et des vétérans

CIMVHR | **ICRSMV**
Canadian Institute for Military and Veteran Health Research | L'Institut canadien de recherche sur la santé des militaires et des vétérans

UBC

University of Victoria

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PHYSICAL HEALTH AND REHABILITATION

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Advances in Primary and Trauma Care

Podium Presentations

1E01: The Effect of Aerosolized Indomethacin on Protein Leak and Lung Inflammation of a Blunt Chest Trauma Rat Model

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Introduction: Acute lung contusion from blunt chest trauma is characterized by an intense inflammatory response in the pulmonary parechyma associated with acute lung injury (ALI), acute respiratory distress syndrome (ARDS), and ventilator-associated pneumonia (VAP). Pulmonary delivery of NSAIDs may reduce both local inflammatory and systemic exposure to the drug. We hypothesize that inhaled indomethacin may reduce decrease alveolar capillary membrane permeability and pulmonary inflammation in a rat blunt chest trauma model.

Methodology: Sprague-Dawley rats (250-300 g) anesthetize with IP injections of sodium pentobarbital (55 mg/kg). Rats tracheotomised and 14G plastic catheter inserted for administration of aerosolize medications. A hollow metal weight (200g) guided onto a metal pole free drop from a height of 38.3cm deliver a total energy of 0.75J to the right side of rat's chest wall while fixed in supine position on a plexiglass platform. Indomethacin (n=8, 1mg/kg) or saline (n=8, 1.0ml/kg) is administered intratracheally (i.t.) at 15-minutes after blunt trauma. The sham group underwent similar procedures without exposure to blunt injury and treatment. At 3-hours post impact, bronchoalveolar lavage fluid (BALF) obtained to analyze the protein concentration, PMN differentiate and cytokines essay.

Results: Post-impact MAP and HR dropped immediately but recovered close to sham group at 30-minute time-point (p>0.05) in both control and treatment groups. Compared to the saline group, BALF analysis demonstrated indomethacin significantly reduces the total protein level (1.06 +/- 0.39 mg/ml vs. 4.01 +/- 1.39 mg/ml; p<0.01) and alveolar FD-70 leak (0.23 +/- 0.07 μg/ml vs. 0.57 +/- 0.08 μg/ml; p<0.01). Indomethacin treated group had a significantly lower inflammatory response both in percent PMN to total white blood cells (16.0 +/- 2.8% vs. 29.3% +/- 3.0%; p<0.01) and inflammatory cytokines IL-6 levels (443 +/- pg/ml vs. 1027+/- 327 pg/ml;l p<0.05) in BALF as compared to the saline group.

Conclusion: Inhaled indomethacin has a protective effect against alveolar tissue permeability and inflammatory response induced by blunt chest trauma.

1E02: Self-propelling Particles that Stop Severe Haemorrhage in Swine by Transporting Tranexamic Acid and Thrombin through Flowing Blood

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Introduction: The outward flow of blood during hemorrhage makes delivering coagulants to the site of bleeding a major challenge, and uncontrolled bleeding is a major contributor to mortality during com-bat [1], [2]. Self-propelling particles have been proposed as a strategy for transporting cargos against blood flow and have become a promising tool for designing agents which manage hemorrhage [3]. Self-propelling particles which can be loaded with tranexamic acid (TXA) and thrombin can be used to transport these cargoes into sites of bleeding to rapidly halt haemorrhage.

Methodology: Self-propelling $CaCO_3$ microparticles were synthesized via precipitation and solid-solid mixing with TXA. The velocity of particles propelling through blood and aqueous solutions was measured by optical microscopy. Thrombin was adsorbed onto microparticles by non-specific, aqueous-phase adsorption. Thrombin-loaded, self-propelling $CaCO_3$ microparticles were tested for their ability to clot blood *in vitro*, and in vivo. The in vivo models include a mouse tail clip model of amputation, a mouse liver puncture model of surgical bleeding, and a swine model of femoral artery hemorrhage without compression. Self-propelling microparticles with TXA, but without thrombin, were also tested for their ability to reduce clot lysis and bleeding.

Results: Self-propelling particles consisting of $CaCO_3$ transported against flow through aqueous solutions and whole blood, up to millimetres into vasculature, at velocities of up to 1.5 cm s-1. Self-propelling, when loaded with thrombin, were an effective hemostatic agent and halted severe hemorrhage in both mouse models of bleeding and the swine model of non-compression.

Conclusion: We have successfully loaded self-propelling particles with TXA with or without thrombin to create two effective hemostatic agents. These particles burrowed into wound sites and reduced bleeding *in vivo*, including in combat-relevant wounds. This material has promising applications in managing multiple forms of hemorrhage, or for delivering other classes of therapeutics such as fibrinolytics.

1E03: Fibrinogen in the Initial Resuscitation of Severe Trauma (FiiRST): A Randomized Feasibility Trial

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Introduction: Decreased fibrinogen levels shortly following injury is associated with higher transfusion needs and mortality. Cryoprecipitate and/or plasma transfusion is the standard-of-care for fibrinogen supplementation during trauma resuscitation. These frozen blood products with short shelf life (few days after thawing) and associated transfusion risks are of limited application in conflict and prehospital settings. Alternatively, fibrinogen concentrate (FC) is a lyophilized product with long shelf life (5years) that can be rapidly reconstituted with distilled water after storage at room temperature. Its ease of use is of particular interest to austere far forward combat settings. However, the feasibility of its early infusion, efficacy and safety remains to be determined in a setting of a randomized controlled trial. The objective of this trial was to evaluate the feasibility, effect on coagulation and safety of early infusion of FC in trauma.

Methodology: Fifty hypotensive (systolic blood pressure = or < 100 mmHg) adult patients requiring blood transfusion were randomly assigned to either 6g of FC or placebo between Oct 2014 and Nov 2015 at a tertiary trauma centre. Feasibility was assessed by the proportion of patients receiving the intervention within 1h of hospital arrival. Fibrinogen levels (Clauss assay) and viscoelastic tests (Thromboelastography [TEG] and rotational thromboelastometry [ROTEM]) were performed simultaneously to evaluate response to treatment and their

correlation. Safety was assessed using 28-day mortality and incidence of thromboembolic events. Fisher's exact test or $X2$ statistics, Student's t-test and Pearson's method were used.

Results: Overall, 95.6% (43/45) [95% CI 86–99%] of patients received the intervention within 1 h; 95.2% and 95.8% in the FC and placebo groups, respectively (p=1.00). Fibrinogen levels remained higher in the FC group up to 12 h of admission with the largest differences at 2h and 4h of hospital admission (0.98mg dL^{-1} difference for both time points; <0.01). At 24 h and 48 h, Clauss assays and viscoelastic testing were similar between study arms. TEG functional fibrinogen and ROTEM FIBTEM assays had significant correlations with the Clauss assay (r=0.64 and r=0.84, respectively; p<0.01).The 28-day mortality and thromboembolic complications were similar between the groups.

Conclusion: Early infusion of fibrinogen concentrate is feasible, improves coagulation and appears safe in trauma. ROTEM might be a better test to monitor fibrinogen replacement therapy. Our data suggest that fibrinogen concentrate may be a feasible hemostatic agent to start damage control resuscitation for bleeding patients in austere far forward combat or prehospital settings where frozen products are of limited application. A larger multicenter randomized controlled trial powered for clinical endpoints is justified and urgently needed.

1E04: A FXIIIa-crosslinkable Polymer can be Formulated in Blood to Recover Clot Adhesion under Fibrin-poor Conditions

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Introduction: Trauma is a leading cause of death worldwide, and haemorrhage contributes up to 40% of these deaths. While the endogenous coagulation cascade is normally effective at halting bleeding through the formation of an adhesive platelet-fibrin plug, excessive haemorrhage and aggressive fluid resuscitation may compromise the effectiveness of this process. One of the mechanisms contributing to trauma-induced coagulopathy (TIC) is the depletion and degradation of fibrin, which would render blood clots non-adhesive to the injured vessel. Therefore, we hypothesize that a synthetic analogue of fibrin can be designed to copolymerize with endogenous blood components during the activation of the coagulation cascade to restore clot adhesion under fibrin-poor or fibrinolytic conditions.

Methodology: A glutamine-containing peptide substrate of coagulation factor XIIIa (FXIIIa) was conjugated to an 8-arm PEG (Q-PEG) and formulated with a polyamine donor, spermidine. This formulation was added to plasma or whole blood, and the lap-shear adhesive strength of the resulting clot to a collagen-coated surface was measured using a Q800 dynamic mechanical analyzer (TA Instruments).

Results: Results show that this formulation increased the adhesive strength of normal plasma clots from 2.0 kPa to 4.2 kPa, and restored adhesion of otherwise non-adhesive (< 0.06 kPa) fibrin-depleted normal plasma or whole blood clots to normal levels (1.8 kPa and 1.9 kPa respectively). The formulation maintained adhesion of clots treated with tissue plasminogen activator, a fibrinolytic enzyme.

Conclusion: We conclude that the adhesion of blood clots can be artificially enhanced by a FXIIIa-crosslinkable synthetic material, even under fibrin-poor conditions, and this may present a novel strategy for the design of next-generation haemostatic agents for the treatment of TIC.

1E05: Rapid Pain Response Protocol using Acupuncture for Clinic and Field Applications

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Acupuncture Canada

Brief Description: This presentation will introduce participants to the use of Acupuncture Canada's (AC) Rapid Pain Relief training which includes the Battlefield Acupuncture (BFA) protocol as a treatment for rapid pain attenuation. The BFA protocol has been implemented in U.S. DoD including Special Forces. BFA training has also been conducted for the Chinese military.

Medical intervention for pain management is a significant concern for CAF soldiers with combat injuries and occupational non-combat injuries. The dominant pharmacological approach has been corroborated with the overuse of opioids and resulting addiction. However, integrative approaches to pain management are being applied with the consideration of acupuncture as an intervention between over the counter analgesics and prescribed narcotics.

Auricular acupuncture is a method that is recognized by WHO for treatment of acute and chronic pain. It normalizes dysfunction in the autonomic system using the pathways of the nerves from the ear to reflex centers in the brain as evidenced in spectroscopic mapping (Litscher, Bauernfeind, Xinyan, Mueller-Putz, Wang, Anderle, Gaischek, Litscher, Neuper & Niemtzow, 2011).

Battlefield Acupuncture is a protocol of auricular therapy that was developed by Dr. Richard Niemtzow, Colonel, U.S.A.F. (Retired). The protocol uses press needles applied in a specific sequence for rapid attenuation of pain (Niemtzow, Belard & Nogier, 2015). The procedure was first used in 2008 at Ramstein Air Base with wounded soldiers and showed significant results. Providing this program for CAF military health providers, will make this treatment available for all CAF military personnel.

Clinical Outcomes: Clinical outcomes include the rapid attenuation of pain using VAS and other appropriate pain scales.

Patient Population: Rapid Pain Relief is an application that would target CAF soldiers returning from combat zones with MSK injuries and soldiers with occupational non-combat injuries. Additionally, it would be suitable as an immediate intervention for soldiers in deployments.

Conclusion: AC's Rapid Pain Relief with BFA is non-narcotic, low risk, fast acting, portable and accessible. It could be used by physicians, physician assistants, physiotherapists, nurses, and medics in clinic and field applications including CSOR and DART deployments.

6A03: A Diagnostic Modeling Study of Fatigue, Alertness and Daytime Sleepiness in Mild Traumatic Brain Injury/ Concussion

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Introduction: Fatigue, alertness and daytime sleepiness are complex perceived states with significant implications for health and safety. These states are not diagnostically specific, and they may, or may not

share interrelated features. Potential commonality or discordance is challenging in clinical situations, especially in certain neurologic disorders, as in cases of mild traumatic brain injury (mTBI).

Methodology: We performed a diagnostic multivariable modeling study to explore associations between patients' characteristics, imaging tests, and clinical investigations and the states of fatigue, alertness and daytime sleepiness. The intensity of fatigue, alertness and daytime sleepiness was measured using the standardized Fatigue Severity Scale (FSS), the Toronto Hospital Alertness Test (THAT), and the Epworth Sleepiness Scale (ESS). Univariate and multivariate linear regression models were used to explicate covariates of fatigue, alertness, and daytime sleepiness.

Results: A total of 94 patients (45.20 ± 9.94 years; 61.2% males) with an established diagnosis of mTBI/concussion were included in the current analysis. Our results revealed that fatigue and alertness in mTBI is best explained by covariates within the domain of brain function integrity, and that daytime sleepiness is best explained by cultural and physiologic bodily states. While fatigue and alertness share common covariates, daytime sleepiness represents a distinct construct in persons with mTBI/concussion.

Conclusion: Our findings challenge the commonly held view that fatigue, alertness and daytime sleepiness are perceptual states on the same continuum. The implications of this finding have direct relevance to the clinical approach towards patients presenting with fatigue, impaired alertness or excessive daytime sleepiness after mTBI/concussion.

Poster Presentations

P141: Improving Outcomes and Modifying Responses in International Surgery

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Department of National Defence

Brief Description: Humanitarian emergencies resulting from natural disasters, conflict, famine, and disease outbreaks are characterized by the collapse of basic health services. At the end of 2014, an 80 million people were in need of humanitarian aid, with 3/4 of those being women and children. Healthcare is one of the three top sectors receiving funding through UN appeals for assistance, provided by international relief organizations, NGO's, local government, and international responses (peacekeeping and humanitarian disaster response). In 2014 and 2015 the Ebola outbreak and conflict in Iraq added to escalating emergencies and protracted crises elsewhere, pushing the numbers of displaced persons to the highest recorded. Emergencies are superimposed on longstanding needs, and on extreme poverty. Over 95% of the world's refugees and displaced persons were in low or middle income countries, and disproportionately represented are the countries with high maternal, newborn and child mortality rates. Better data collection is required for situation analysis in order to aid decision making, coordination, and responses to humanitarian crises. The first step in data gathering and analysis will be a systematic review using MEDLINE and similar databases for retrospective data on civilian populations treated in conflict and disasters. We will search the websites of organizations (See Annex A) known for humanitarian work for data concerning the most common health and surgical issues treated. Once the common problems are identified, a data-collection tool adapted from those extant, or formulated based on these will be used to form a prospective dataset to identify our own commonly encountered

global surgical problems, and most beneficial/lifesaving interventions. Collating and reporting annually will allow us to formulate a training plan directed to these specific needs, to teach the relevant core surgical skills and to facilitate ongoing re-evaluation, modification and enhancement of these competencies, tailoring them to new urgent needs. Finally, a long-term data review program will allow transition from individual/group responses to a broader application in guidance of organizational medical response planning and resource allocation in the face of a multitude of humanitarian crisis situations.

Clinical Outcomes: Morbidity and mortality data to be reviewed, eventually similar outcomes on our datasets, with clinical responses to appropriate surgical interventions.

Patient Population: Global populations in disaster and humanitarian crises, presenting to any local care facility with surgical capability.

Conclusion: Global humanitarian surgical challenges differ substantially from standard practices, and require an alteration of training for international general surgeons. Better data collection is the first step in modifying our training practices and responses to these challenges.

P142: A Combined Mathematical Model of Pharmacokinetics and Blood Coagulation for Fibrinogen Administration in Trauma

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Introduction: Trauma-related hemorrhage is a leading cause of death in the military. Fibrinogen, a soluble coagulation factor, is crucial for the formation of a blood clot. Interest in fibrinogen concentrate for hemostatic resuscitation in trauma care has grown in recent years. A combined model of fibrinogen pharmacokinetics (PK) and blood coagulation is potentially a valuable tool for predicting the effects of fibrinogen concentrate administration following a traumatic injury.

Methodology: A physiologically-based pharmacokinetic (PBPK) model for fibrinogen was developed using MATLAB Simulink® with model parameters derived from previously published data. A standalone blood coagulation model was developed in tandem based upon work by Wajima et al. and verified by prothrombin time (PT) and activated partial thromboplastin time (aPTT) data from other sources. The two models were merged for the combined PBPK and coagulation model with the addition of hemodynamic modules for predicting the pharmacokinetics and hemostatic effects of fibrinogen in trauma. Changes in blood volume, blood flow rates, blood pressure and hematocrit under trauma conditions were considered by adjusting physiological parameters with additional options for fluid resuscitation and blood transfusion. Model simulations were compared to clinical data in the literature including ours for early infusion of fibrinogen concentrate in trauma.

Results: The combined PBPK and coagulation model is capable of predicting plasma fibrinogen concentration following trauma. The model remains effective when compared to clinical data from multiple sources and responds to differences in therapeutic regiments. PT and aPTT simulations from the combined model tend to underestimate clinical data, suggesting that some physiological components may be missing or misrepresented in the model. Model improvements are ongoing in support of new features for better prediction accuracy.

Conclusion: A physiologically-based mathematical model simulating the combined effects of fibrinogen pharmacokinetics and blood co-agulation was developed. Further development and validation of the model against clinical data are required. However, the model provides a good foundation in realizing a mathematical program to support and even guide fibrinogen administration for use in military trauma.

The Ethics of Health Care

Podium Presentations

1A03: Mental Health Outcomes and Treatment Seeking in CAF Members at Risk for Moral Injury

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Introduction: The 12-month prevalence of posttraumatic stress disorder (PTSD) has nearly doubled (2.8% to 5.3%) in the Canadian Armed Forces (CAF) personnel between 2002 and 2013; this signifies an imminent need for an enhanced understanding of how military operations affect the psychological health of CAF personnel. There is accumulating evidence that suggests a link between moral injury (the psychological distress caused by any action or inaction that transgresses a moral standard), and PTSD, depression, and suicidal ideation. Critically, individuals exposed to morally injurious events commonly report symptoms of shame, feelings of worthlessness, and may exhibit self-blame and social withdrawal; these symptoms may exacerbate psychological distress and treatment-seeking avoidance. Furthermore, current treatment interventions for PTSD have centred predominantly on fear-based symptoms and may not be sufficient for individuals exposed to this unique class of psychological trauma. The three objectives of this study are: (1) to investigate whether deployed personnel at risk for moral injury present with altered treatment seeking behaviour and (2) display increased prevalence of PTSD and a delayed and/or more chronic onset pattern; (3) whether moral injury exposure uniquely contributes to shame-related diminished meaning of life, which may preclude treatment seeking.

Methodology: The 2013 Canadian Forces Mental Health Survey data on previously deployed personnel will be analysed. The impact of exposure to morally injurious events will be explored in relation to treatment-seeking outcomes (utilization of mental health services, treatment discontinuation, and perceived need for care), PTSD symptom onset and chronicity, and diminished meaning of life. A series of binary, ordinal, linear, and multivariate regressions will be conducted, controlling for exposure to other deployment and non-deployment-related psychological trauma, military factors, and sociodemographic variables.

Results: Analyses are currently underway. Preliminary results demonstrate that approximately 58% of personnel were exposed to events that heighten the risk of moral injury (e.g., unable to help seen ill or injured women or children; felt responsible for the death of Canadian or ally personnel; had difficulty distinguishing between combatants and non-combatants) during deployment. Exposure to these events significantly predicted presence of past-year PTSD diagnosis while controlling for other deployment-related experiences.

Conclusion: The results of this study will yield a more comprehensive understanding of the impact of moral injury on treatment-seeking and may guide the development of optimal treatment interventions for CAF personnel exposed to morally injurious events.

Poster Presentations

P167: Spirituality and Mental Health within Veterans: A Systematic Review

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University of Calgary

Introduction: There is a growing recognition of the importance of including spirituality within healthcare, particularly within trauma care where psychological, emotional, and spiritual issues often present with similar distress and symptomology. Persons who experience trauma often have significant difficulties with such issues as hopelessness, forgiveness, and a sense of meaning and purpose. Corresponding results have been reported in research from positive psychology, specifically that resiliency, forgiveness, and self-compassion are essential for mental well-being after trauma. While there is emerging academic literature to support the inclusion of spirituality within trauma care, the exact state of evidence for spirituality within veteran populations has not been established. The purpose of this systematic literature review was to critically appraise spirituality literature within veteran populations.

Methodology: Primary studies explicitly examining spirituality or religion, and spiritual care interventions, within veteran populations were included. Veterans' mental health, mental illness, or well-being outcomes were explored. English-language quantitative, qualitative, and mixed method studies were selected for inclusion regarding of publication status or year. Electronic databases (CINAHL, PsycINFO, MEDLINE, JSTOR, and Web of Science) and grey literature sources (conference proceedings, key journals, and relevant organizational websites) were searched. Two reviewers independently screened the records in two phases: (1) abstracts/titles, (2) full-texts. Data extraction was conducted for all included studies using a standard extraction form.

Results: Overall, 30+ primary studies were included in the review. Preliminary results indicate that veterans who employ positive spiritual coping experience less distress and increased posttraumatic growth while negative spiritual coping is linked to poorer post-traumatic outcomes including PTSD, depressive tendencies, and suicidal behavior. In addition, experiences of negative spiritual coping strongly overlapped with emotional and psychological issues associated with moral injury such as guilt, shame, hopelessness, and difficulties with forgiveness of self and others. This review also discovered a significant lack of evidence-based spiritual interventions.

Conclusion: This is the first systematic review of the existing literature regarding spirituality within care of combat veterans. The results of this review can help to identify the key evidence gaps both within research and clinical practices. Determining these evidence gaps could guide future research in the area of spirituality, moral injury, and mental health; particularly in regards to evidence-based interventions. Clearly identifying the connections between spirituality, moral injury, and mental health may increase clinicians' awareness of these issues and thus ultimately improve the therapeutic outcomes for the veterans they care for. More, greater interdisciplinary collaboration between chaplains and mental health practitioners is recommended based on this evidence.

Gender Differences in Health

Podium Presentations

5B01: Early Prevention of Major Depression in Canadian Male Workers: The BroMatters Study (1 of 2)

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Introduction: Major depression is prevalent in men. But men are less likely to disclose depressive symptoms and often delay seeking help until symptoms become severe. To address this complex issue, the Movember Foundation funded the BroMatters project. The objective of this presentations is to describe the rationale and methodology of the BroMatters, to highlight results of a national survey about preferred design features of e-mental health programs in men who are at high risk of MDE, and to demonstrate the e-mental health platform.

Methodology: The overall goal of the BroMatters is to develop effective, acceptable and sustainable e-mental health solutions for men to reduce their risk of major depression. As one of the three projects of BroMatters, a cross-sectional survey in 10 Canadian provinces was conducted from March to December 2015 in working men who were at high risk of major depression, using random digit dialing of landlines and cell phones. Personal risk of having depression was determined by a multivariable risk prediction algorithm for major depression in men. Five hundred and eleven working men who were at high risk and 330 at low risk completed the interviews.

Results: The BroMatters consists of three inter-related projects. Project A (the national survey) found that, for high risk men, the top three features were: "information about improving sleep hygiene", "practice and exercise to help reduce symptoms of stress and depression" and "having access to quality information and resources about work stress issues". The barriers of use included: privacy issues, perceived stigma, ease of navigation, personal relevance, and lack of personal interaction, time and knowledge. Differences in design features between English- and French-speaking participants were found. Based on these findings, a working prototype of a BroMatters e-mental health platform (BroHealth) was designed and usability testing was conducted to refine it. BroHealth is currently evaluated by a randomized controlled trial (Project B). Project C involves cross-country focus group meetings with working men about workplace challenges and issues and effective strategies so as to develop an open-access educational package for men in the workplace.

Conclusion: There is a pressing need for innovation in prevention of major depression in male workers. E-mental health programs may be a promising solution for this complex issue. However, development of e-mental health programs will need to take consideration of users' preferences and perceived barriers so that the programs can be effective, acceptable and sustainable.

5B02: Supporting Working Men's Mental Health: Stress, Strategies and Suggestions for Employers from The BroMatters Study (2 of 2)

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University of Calgary

Introduction: Major depression is prevalent among working men. Yet men are less likely to disclose depressive symptoms and often delay help seeking until symptoms become severe owing in part, to concern over potential negative judgments from family, friends and colleagues. These gender specific experiences, along with a limited knowledge base about effective mental health interventions, call for innovative solutions tailored to men. The Movember Foundation funded BroMatters study making strides in responding to working men's mental health needs. The purpose of this presentation is to contribute to understandings of how employers can better support the mental health of working men. Specifically, we present findings from our examination of qualitative data collected from working men who discuss their sources of stress, their strategies for managing stress, and their suggestions for how employers can reduce work-related stress.

Methodology: We anchor our study in critical social structural theorizing consistent with Tausig's conception (2013) of the sociology of work and well-being. As such, we treat work-related stress not only in terms of individual employee experiences but also as a contextual product that arises amidst evolving and intersecting systems, markets, structures and institutions. We use a narrative approach to analyze stories of working men (N = 132) collected through semi-structured one-on-one and focus group interviews. Working men described their experiences and views about sources of stress versus sources of support for their mental health and what employers can offer to reduce stress and support mental health.

Results: We found three main themes of sources of stress: job expectations, relationships, and obstacles to mental health disorder detection and prevention. Strategies for managing stress included three main themes of maintaining interests, activities and relationships unrelated to work, accessing work resources, and accessing professional resources beyond work. Finally, suggestions for what employers can do were reflected in two major themes of: modeling as well as implementing work-life balance, and promoting and enhancing mental health awareness and supports.

Conclusion: We conclude with a discussion of the ways in which our findings build on earlier work about how employers and policy makers can better promote working men's mental health and how these findings can be translated into supportive workplace practices.

5B03: Gender Differences in Health Care Inflation Costs: Comparison of Region with Low and High Concentration of Canadian Armed Forces

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[1]Université du Québec en Outaouais; [2]Statistics Canada; [3]University of Montréal

Introduction: In order to predict the budget for Canadian Armed Forces (CAF) in the recessionary context, we have to determine the main drivers of health care inflation cost for a cohort of Canadians who have similar demographics to those found with the CAF. The aim of this study is to compare the main drivers of health care inflation costs by comparing the gender differences, and also the difference between the region with low and high concentration of CAF.

Methodology: The literature review mentions that the health care system expenditures are driven by three mains factors: (i) demand of health care services by patients; (ii) supply the health care services by providers (hospitals, medical professional and supplies); and (iii) the state of government (macroeconomics factors: Goods Domestic Products (GDP), Customer Price Index (CPI), Unemployment).

Based on recent data from Canadian Institute for Health Information (CIHI) and Statistics Canada, we have collected the information related to these previous factors of civilian for Canadian civilian population aged 20 to 64 from 2003 to 2012. Descriptive statistics were used to present the variation of all the indicators over ten years. Bivariate analysis were conducted to present the unadjusted association between health care expenditure and each of the three factors. Finally, multivariate panel analysis using the Oaxaca-Blinder procedure were performed to show the adjusted main drivers of health care inflations cost by gender and by region with low and high concentration of Canadian Armed Forces. All the data analysis were performed with STATA-13.

Results: The analysis showed the difference between men and women according to the drivers of health care inflations cost. They also presented the difference between region with low and high concentration of CAF. The main drivers of health care inflation cost were mainly the characteristics of population the demand of health care services by population (Health risk factors and health factors). Comparing the both region, the health care goods and services Customer Price Index (CPI) is one of the drivers amongst others.

Conclusion: The budget of CAF would be predicted not only by taking into account the CPI index but mainly the Characteristics of non-civilian population.

Mental Health and Rehabilitation

Podium Presentations

1A01: Exposure to Mental Health Training and Education in the Canadian Armed Forces: Predictors of Exposure and the Association of Exposure with the Perceived Helpfulness of Training

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Department of National Defence

Introduction: Over the past decade, many military organizations have reinforced their use of mental health training and education (MHTE). The typical objectives of this training are to enhance resilience, improve mental health literacy, and decrease stigma and other negative attitudes towards mental health care. However, the extent of exposure to such training in the Canadian Armed Forces (CAF) is unknown, as are the predictors of exposure and its perceived helpfulness.

Methodology: This analysis used data from the 2013 Canadian Forces Mental Health Survey, which was collected by Statistics Canada on behalf of the CAF. Respondents were randomly-selected serving Regular Force personnel and Reservists who had deployed in support of the mission in Afghanistan (overall N = 8,200). Hours of MHTE exposure over the previous five years in six different contexts were assessed with items developed for the survey. Respondents indicated how helpful they found the training in dealing with stressors, with response categories of "not at all," "a little", "some," and "a lot."

Results: 70% of the population reported at least some exposure to MHTE; median overall exposure in those with at least some exposure was 11 hours (inter-quartile range, 5 - 24 hours). Independent predictors of any exposure to MHTE (assessed using modified Poisson regression)

were age <= 45 years, being stationed in Quebec, being in the Army or Air Force, and being a senior NCM, and having deployed in support of the mission in Afghanistan. Predictors of overall MHTE hours (using ordinal regression) were similar. The perceived helpfulness of MHTE fell on average between ratings of training helping "a little" to "some." Even small amounts of training (4 hours or less) were associated with training being perceived as "a little" helpful, on average. The perceived helpfulness of training did not plateau until approximately 30 hours of exposure, attaining a maximum value approaching the perception that the training helped "some," on average.

Conclusion: A broad range of hours of MHTE exposure was seen in CAF personnel. Factors predicting exposure were identified, but the overall predictive value of the models was poor, meaning that outreach efforts informed by these factors will be inefficient. An individually-oriented approach to targeting training is more appealing, but this will require administrative data on exposure for each individual. Even minimal training is perceived to be "a little" helpful, and offering additional training even to those with substantial exposure may still contribute incrementally.

1A02: Mental Health Stigma and its Impacts in CAF Personnel and Canadian Civilians

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Introduction: Evidence suggests that military service may be associated with greater mental health stigma, an important barrier to care. There are, however, few direct comparisons with civilian populations, and recent research showing greater mental health service use in military personnel calls this into question. This study compared the prevalence and impacts of mental health stigma in Canadian Armed Forces (CAF) personnel and Canadian civilians.

Methodology: Data were obtained from two highly comparable population surveys: the 2013 Canadian Forces Mental Health Survey and the 2012 Canadian Community Health Survey- Mental Health. Perceived stigma was assessed in those who reported care-seeking for a mental health problem in the past 12 months. Follow-up questions assessed the impact of stigma in various domains (e.g., work, housing). The civilian sample was restricted with a number of exclusions (outside the age range of the CAF, not full-time employed) in order to increase comparability with the military population. Modified Poisson regression and linear regression were then used to examine the effect of military (versus civilian) on care-seeking, stigma, and stigma impact, with adjustments made for differences across populations in terms of socio-demographic characteristics and the need for mental health care.

Results: Military personnel (35.4%) were significantly more likely than civilians (21.0%) to have perceived mental health stigma (PRR= 1.70, 95% CI= 1.11, 2.60) and were more impacted by stigma, particularly in terms of their work/school life (b= 1.01; SE=0.23; p<.001). However, military personnel (16.4%) were also significantly more likely than civilians (6.4%) to have sought care (PRR= 1.86, 95% CI= 1.53, 2.25). These effects remained after controlling for differences in socio-demographics and the need for care across populations.

Conclusion: Military personnel experience a disproportionate amount of mental health stigma relative to Canadian civilians and are more impacted by such experiences. Nevertheless, military personnel were more likely to seek care, pointing to a complex relationship between stigma and care-seeking in the military.

1A04: All But Forgotten: The Korean War as a Case Study for the Barriers Veterans Face in Seeking Care and Compensation

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Introduction: Over the past century, psychologically wounded veterans have faced exceptional challenges in accessing adequate compensation and care. Veterans of unpopular conflicts like the Korean War (1950-1953) have encountered additional barriers. Over 26,000 Canadian soldiers deployed to Korea as part of a UN coalition force. While troops were engaged in fierce fighting and endured extreme privations, the operational aims of the war were unclear and public support continually declined. This presentation examines Korea as a case study of the obstacles that veterans of politically unpopular wars face in returning home and accessing help for mental health.

Methodology: The research will use primary and secondary sources to identify the barriers that Korean War veterans met in seeking compensation and/or treatment for psychological disabilities. It takes a comparative approach by evaluating Canadian policy in relation to other major Commonwealth countries (e.g. UK, Australia). In addition, it will assess whether changes to pensions policy and the liberalization of social attitudes up to the present opened new avenues of care for elderly veterans. Finally, it will examine the implications of this case study in shaping new initiatives to better support the next generation of Canadian veterans.

Results: The official pension/care system was not designed for psychological casualties and was inherently antagonistic. In 1956, less than 3% of Korean War veterans were in receipt of a service or disability pension. As veterans of an unpopular war, soldiers returning from Korea were also denied the traditional forms of support upon which their predecessors had relied. For example, many were rejected as members by local veterans' organizations. Moreover, the popular portrayal of Korea as a minor 'police action' imposed further restrictions on the treatment options open to ex-servicemen.

Conclusion: The Korean War highlights the numerous barriers that psychologically injured veterans have faced and continue to encounter in the present. Furthermore, this case study underlines the hurdles that ex-service personnel experience in the event that they have participated in a war that is considered politically unpopular or contentious. It is hypothesized that veterans of recent deployment like Iraq and Afghanistan may encounter similar obstacles to care in the near future as both conflicts fade from public consciousness. This will necessitate a proactive approach to improving access to treatment and encouraging community level efforts to engage with veterans in need.

1A05: Recent Mental Health Care Seeking Patterns in the CAF: Can Social Support Help Increase Use of Professional Health Services?

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Introduction: Researchers have investigated barriers to professional care seeking and perceived need for care in Canadian Armed Forces (CAF) personnel; however, relatively less remains known about variables that may facilitate mental health care, including social networks. Theory suggests referral to mental health services may occur when members of a social network (e.g., family) identify mental health symptoms displayed by an individual, encourage the individual to seek professional mental health care, and provide guidance at the time of seeking care. The current study was designed to examine whether seeking care from different sources of social support (i.e., spiritual advisers, friends, family members, colleagues, Operational Stress Injury Social Support [OSISS] program) can increase perceived need for care and professional mental health service use in CAF personnel.

Methodology: Participants included all Regular Members from a nationally representative Canadian military sample ($n \approx 6,700$; response rate 78.7%; 2013 Canadian Forces Mental Health Survey). Participants completed a self-report questionnaire assessing demographic variables, past 12 months mental health status (e.g., posttraumatic stress disorder, major depressive disorder), past 12 months seeking care from social support (i.e., "have you seen, or talked on the telephone to, any of the following people about problems with your emotions, mental health or use of alcohol or drugs?"), past 12 months perceived need for care, and past 12 months professional mental health service use. Logistic regression analyses were conducted to determine whether seeking care from social support predicted professional mental health service use and perceived need for care after controlling for relevant covariates (e.g., sex, rank, mental health status).

Results: Past 12 months seeking care from spiritual advisers (OR=2.69), family members (OR=3.56), friends (OR=1.65), colleagues (OR=2.63), and OSISS (OR=20.25) was statistically significantly associated with past 12 months professional mental health service use. Past 12 months seeking care from spiritual advisers (OR=3.91), family members (OR=3.29), friends (OR=1.85), colleagues (OR=3.07), and OSISS (OR=37.44) was also statistically significantly associated with past 12 months perceived need for care.

Conclusion: Results suggest seeking care from social networks may facilitate perceived need for care and use of professional mental health services in CAF personnel. The current analyses were correlational and assumptions of directionality would need to be verified in a prospective longitudinal study; however, novel initiatives geared towards social networks of CAF personnel and the role of such networks in the care seeking process may increase use of professional mental health services in this population. Comprehensive results, implications, and future research are discussed.

1A06: An Environmental Scan of the Mental Health Services Available to Military Families through Military Family Resource Centres

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Introduction: Mobility, separation and risk are unique lifestyle characteristics of the Canadian Armed Forces (CAF) that impact the majority of military families. For some, this creates challenges to maintaining physical and mental health. With the recent deployment of military personnel in support of the mission in Afghanistan, there has been concern that these challenges have increased, especially those related to mental health.

Military Family Services conducted an environmental scan and survey of Military Family Resource Centre (MFRC) subject matter experts in order to:

- Map out exactly what mental health programs and services are

available at each MFRC location;

- Identify the most common mental health issues facing military families seeking support from MFRCs; and
- Prioritize gaps in mental health services for military families.

Methodology: An online survey was developed based on an initial literature review of the mental health issues facing military families and the existing compilation of services in the CAF *You're Not Alone* guide to mental health services. Lead mental health staff from 34 MFRC locations completed the survey.

Results: Results revealed the most common reasons families requested support from MFRCs are for relationship difficulties, child/youth mental health and behavioural issues, transition adjustment difficulties, anxiety disorders and mood disorders. MFRCs offer a vast number and variety of programs and services ranging from outreach and engagement, to peer support, to psychoeducational services, to psychosocial services, to mental health treatment services. In total there are approximately 90 different mental health programs and services offered across Canada, most of which are not easily located through website searches nor included in the CAF *You're Not Alone* guide, making family access to service challenging.

Conclusion: Recommendations were offered to address gaps and deficiencies in services including:

- Conduct additional research to better understand the predominant mental health issues and service gaps for military families who don't use MFRC services;
- Develop a more robust CAF *You're Not Alone* communication strategy to connect military families directly to consistent mental health programs;
- Determine minimum standards for baseline services that should be consistently available to any military family regardless of their location that address family needs arising from the unique military lifestyle challenges; and
- Explore the option of an enhanced family advocacy function to help families navigate through the various complex military, MFRC and civilian community systems of mental health supports.

1B02: Qualitative Study on Mental Health of Military Families in Transition to Civilian Life

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Introduction: Every year, approximately one thousand military personnel are medically released from the Canadian Armed Forces (CAF; DND, 2014). The complexities of years of military service are multiplied for many service members as they negotiate the new challenges of transitioning into civilian life. The challenges, however, are not limited to the service members; children and families are also transitioning in their identity from military to Veteran family. This can include navigating a civilian health care system, adjusting to changes in child school setting and support, and finding critical peer and social support if the release includes a community move (Cramm et al., 2015). As a result, a recent Ombudsman report (DND/CF, 2016) makes 15 recommendations to support the well-being of Canada's military families, but little is known about the process of adjustment, support-seeking, and thriving for family members who are key to a successful transition for the released CAF member. Thus, the present study is intended to hear from the voices of those family members as they are immersed in the

process transitioning to civilian life.

Methodology: 30 families from across Canada were invited to participate in qualitative, semi-structured interviews. Family members included any person who provided care/social support/help to the Veteran who was released in the past 1-2 years, including spouse/partner, adult child, or parent. In particular, families who are supporting Veterans with mental health problems (including OSIs) will be a critical sampling population for the study. Interview items included questions pertaining to changes to daily routines and patterns of family functioning, changes in family identity and definition, issues of reintegration into civilian communities, methods of seeking medical and psychological support, and the mechanisms of formal and informal social support that contribute to their well-being and thriving. Interviews were taped, transcribed, and analyzed using MAXQDA data analysis software.

Results: Preliminary results will be discussed and focus on the adaptive and resilient factors that are contributing to families' ability to retain or regain healthy functioning. In particular, the findings will be presented that explore the common (e.g., family support, access to mental health services) and unique (e.g., rural vs urban, treated vs untreated OSI) factors that are reported to account for family and member well-being.

Conclusion: The preliminary results will provide a critical inquiry into the lives of CAF families as they transition into civilian life. The first-hand narratives will also serve to illuminate the obstacles and sources of resilience needed for CAF families to navigate this unique life stage.

1B03: Mediating Effect of Social Support on the Relationship between Family and Household Composition and Mental Health Disorders

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Department of National Defence

Introduction: Previous research has revealed that the prevalence of certain mental health disorders in the Canadian Armed Forces (CAF) is nearly twice that seen in the general Canadian public. Given the well-established links between mental health disorders and a variety of organizational outcomes of relevance to the military, understanding the nature of these mental health disorders and, in particular, determining some of their psychosocial determinants may help military leadership with developing strategies to mitigate these problems. Recent work in this area has examined the relationships of a number of factors that may characterize family and household composition, including marital status, living arrangements, and number of dependants, with CAF members' positive mental health, in addition to the mediating role of social support in these relationships. Findings revealed that social support mediates some of these relationships, but not all, demonstrating the importance of considering the myriad of relevant psychosocial factors and pathways when examining mental health. Given the prevalence of mental health disorders in the CAF, the current study aims to extend this previous work to examine the effect of these same family and household characteristics on a number of specific mental health disorders and the mediating effect of social support on these relationships.

Methodology: Data for this study come from the 2013 CAF Mental Health Survey. A structural equation model will be applied to the data to examine the relationship between family and household characteristics and mental health disorders as mediated through social support. Family and household characteristics of interest include marital status

(married or common-law, divorced or separated, and single members), living arrangements (living alone or living with others), and number of dependents (absence or presence of any dependants under the age of 18). Social support will be examined as a mediator, while post-traumatic stress disorder, major depression, and generalized anxiety disorder will be examined as outcomes.

Results: In line with past findings, it is anticipated that the mediating effect of social support will vary depending on the family or household characteristic under consideration, thus pointing to complex relationships and further emphasizing the value of assessing and considering multiple characteristics as psychosocial determinants of mental health.

Conclusion: In addition to better understanding some of the psychosocial determinants of mental health, the conclusions from this work will help inform the development of policies, programs, and services that can improve well-being and prevent mental health disorders among CAF members.

1B05: Navigating Healthcare Systems for Military-connected Children with Autism Spectrum Disorder: A Qualitative Study of Military Families Experiencing Mandatory Relocation

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Introduction: Mandatory relocation occurs repeatedly for most military families. The Ombudsman's 2013 report noted that such relocations are highly disruptive to family life and one of the most unsettling features of the Canadian Armed Forces lifestyle. Notably, "Accessing health care and maintaining a reasonable level of continuity during mandatory moves remains a persistent challenge for military families" (Daigle, 2013). The disruptive nature of relocations may be even more pronounced when the family includes a child with special needs, as such children often require education supports and specialized health care. Given the different healthcare systems for American and Canadian families, available research may have limited application to the Canadian context. A better understanding of the issues surrounding navigating a complex web of services and supports to access healthcare may ultimately translate into better practices and policies to reduce stressors on military families when they are relocated. The main goal of this qualitative study is to gain a better understanding of military families' experiences when they are posted to a new community and need to access services and supports for children with autism spectrum disorder (ASD), one of the most prevalent developmental disabilities.

Methodology: This phenomenological study seeks to describe the shared "lived experience" of military families who are navigating health care systems for their children with ASD within the context of mandatory relocation. Semi-structured qualitative interviews are being conducted in person or by phone, transcribed verbatim, analyzed, and coded into overarching themes.

Results: At the time of writing, 8 participants had been interviewed. Recruitment will continue until theoretical saturation is achieved, which is estimated at between 12 and 20 participants. Preliminary findings suggest that the challenges faced by these families are likely to be exacerbated by relocation, for reasons such as inter- and intra-provincial differences in health, education, and eligibility for ASD services (most notably behavioural intervention), and being placed at

the bottom of waiting lists for those services.

Conclusion: These preliminary results suggest that military families experience additional challenge and burden when tasked with system navigation for children who have ASD. Enhanced coordination of services and communication across inter-jurisdictional providers is recommended, along with health care system literacy and advocacy strategies for families.

1C01: Preliminary Investigation of a CAREN-based Intervention for Individuals with Chronic Combat-related Posttraumatic Stress Disorder

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Introduction: Several exposure-based therapies for treatment of Posttraumatic Stress Disorder (PTSD) have been proven successful. However, not all patients draw full benefit from these treatments, or drop out from treatment, especially among veterans with combat-related PTSD. For these patients the Motion-Assisted, Multi-Modal Memory Desensitization Reconsolidation (3MDR) CAREN-based protocol may have additional value. This treatment incorporates walking with known therapeutic elements from Virtual Reality Exposure therapy and Eye Movement Desensitization and Reprocessing. In this combination, our members can be optimally challenged to approach their traumatic memories.

Methodology: Eight Canadian Armed Forces members with chronic posttraumatic stress disorder were recruited to participate in this study. Participants were excluded if they presented with acute suicidality, severe alcohol and/or substance dependence, acute psychosis, or if they were not stable for at least 2 weeks. Participants completed six 3MDR treatment sessions approximately 30-45 min while walking on a treadmill. Each treatment session began with a warm-up period while listening to music that reminded the participant of their deployment. After the warm-up period, the participant started a repetitive cycle consisting of three phases evolving around a deployment related photograph: 1) approach, 2) discussion, and 3) a variant of eye movement desensitization and reprocessing (EMDR). At the end of the last cycle, a song that provided positive feelings was played during a cool down period. Outcome measures included assessment of PTSD symptoms (PLC-5), avoidance behaviour (PABQ), thought suppression (WBSI), anxiety (GAD-7), depression (PHQ-9), alcohol use (AUDIT), and social functioning (OQ-45.2) were before and after treatment. Subjective Units of Distress (SUDS) were captured during treatment sessions.

Results: Eight participants (6 male and 2 female) are currently enrolled in this study. Two participants withdrew after the first session since they no longer met the inclusion criteria. Currently, three participants have completed this protocol. Baseline SUDS were on average 3±2 and reached a maximum of 7±2 during treatment sessions. After six treatment sessions, PLC-5 scores for the three participants decreased by 2, 9, and 17, indicating a reduction in PTSD symptoms.

Conclusion: Preliminary findings demonstrated that members combat-related PTSD can benefit from 3MDR CAREN-based therapy. However, more treatment sessions may have been needed to see a reduction in symptoms for members that showed smaller changes in symptoms. The lessons learned from this study will help optimize CAREN-based therapeutic protocols and provide scientific basis for

moving forward with a larger randomized control trial.

1C03: Continuing Research on the R&R Protocol: A Brief Non-traumatizing Intervention for PTSD

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Introduction: The reconsolidation of traumatic memories (RTM) protocol is an intervention for PTSD based upon the blockade of reconsolidative memory processes. It is supported by more than 25 years of anecdotal and clinical reports that consistently reflect permanent changes in phobias and PTSD using a brief, non-traumatizing, visualization exercise. In 2015, Gray & Bourke reported results of a 30-person waitlist controlled study showing loss of diagnosis in 96% of participants completing treatment. Diagnosis was confirmed using PCL-M and clinical observation. Mean PCL-M score at intake was 61 points. At the 6-week follow-up, the mean PCL-M score was 28.8, with a mean reduction in scores of 33 points. Since that time three other more rigorous studies have been completed with similar results. Full details of the three new studies will be reported.

Methodology: We present three waitlist-controlled RCTs using male and female volunteer veterans from Vietnam through the present with mixed battle and non-battle-related traumas. Participants reported multiple ethnic backgrounds and came from all branches of the armed forces. Demographic factors were non-significant. Participants were referred by Veteran's organizations and mental health professionals and were required to have ≥1 flashback and/or nightmare per month with PCL-M and PSS-I scores ≥ 50 and 30 respectively. Prospective participants suffering from the dissociative subtype were excluded as were persons unable to cooperate with the procedure. Further inclusion and exclusion criteria are discussed. Control subjects were offered RTM at the end of their six-week control participation. The treatment was completed in three 90-minute sessions. Prospective participants suffering from the dissociative subtype were excluded.

Results: In all three studies, compared to waitlist, this imaginal treatment, using triple dissociation and rescripting, eliminated PTSD diagnosis in ~80% of participants among more than 150 total participants. Loss of diagnosis remained stable with gains observed at two-weeks post maintained at 6 months or more post treatment. Data is provided in terms of repeated measures ANOVA with Hedges g reported for all measures.

Conclusion: The RTM Protocol is a brief, non-traumatizing, cost effective intervention for PTSD. In the course of four studies, the intervention has consistently provided both clinically and statistically significant results. More importantly, it has changed the lives of many veterans. These results provide evidence for the continued evaluation of the protocol by independent investigators, including military and veterans' departments for whom this intervention in its humanitarian, personnel and economic aspects may be particularly relevant.

1C04: Blessure de stress opérationnel et équithérapie : Évaluation sommative du Programme d'aide aux vétérans en équitation thérapeutique (PAVÉ)

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Introduction: Ce projet de recherche s'intéresse à la valeur et à l'utilité d'un programme d'aide destiné aux anciens combattants des Forces armées canadiennes qui souffrent d'une blessure de stress opérationnel. Le Programme d'aide aux vétérans en équithérapie (PAVÉ) est celui qui est à l'étude. Il se veut une version québécoise et adaptée du programme américain *Equine Assisted Psychotherapy* (EAP) *and Equine Assisted Learning* (EAL) de *l'organisation Equine Assisted Growth and Learning Association* (EAGALA). Les principales caractéristiques du PAVÉ sont une approche multidisciplinaire (clinicien en santé mentale et spécialiste formé en équithérapie), le respect d'un code d'éthique par les professionnels, un programme qui se déroule au sol (aucun montage de cheval) et un modèle orienté vers les solutions.

Methodology: Une vingtaine d›anciens combattants a été ciblé pour participer à l'étude. En fonction des objectifs de la recherche, nous avons privilégié une méthodologie mixte : 1- Les participants ont rempli un court questionnaire sociodémographique. 2- Les participants ont complété une évaluation du fonctionnement psychosocial. 3- Les participants ont répondu en deux temps (t1 = deux semaines avant le début des séances; t2 = deux semaines après la dernière séance) à un questionnaire qui inclut des échelles validées. 4- Les participants ont rencontré l'équipe de chercheurs dans le cadre d'un entretien individuel, semi-dirigé. Pour la partie qualitative, une analyse discursive et phénoménologique a été développée à l'aide du logiciel NVivo 10. Pour la partie quantitative, les données ont été traitées à l›aide du logiciel SPSS 22.

Results: Les résultats préliminaires seront disponibles vers le début du mois de juillet 2016.

Nous sommes actuellement à finaliser la collecte d'une partie des données pour un premier groupe de participants. Nous pourrions faire une mise à jour de cette section de notre proposition de communication au mois de juillet 2016.

Conclusion: Ce projet a permis de jeter un regard approfondi sur le Programme d'aide aux vétérans en équitation thérapeutique et sur son utilité et sa pertinence dans le traitement des anciens combattants souffrant d'une blessure de stress opérationnel. Il permet aussi de donner des pistes tangibles aux décideurs des ministères de la Défense nationale et des Anciens combattants par rapport à ce type d'intervention en santé mentale.

1C05: Service Dogs for Veterans with PTSD: Usability Analysis after 2 to 4 Years of Ownership

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Introduction: There are currently more than 12 dog training schools in Canada that deliver psychiatric service dogs (PSD) for different clienteles, including Veterans with post-traumatic stress disorder (PTSD). There is however no scientific evidence supporting the effectiveness of PSD used by Veterans with PTSD. One of the objectives of our research team is to depict the usability of service dogs from the perspective of Veterans with PTSD after 2 and 4 years of ownership.

Methodology: An exploratory qualitative case study research design

was managed. E-mails were sent out to five dog training school managers who were each asked to recruit two veterans living with a dog trained for different needs. A research professional administered and recorded phone semi-structured interviews (25-105 minutes) with 10 Veterans owning a PSD for at least 2 years. Veterans were asked four questions about their (1) use of the PSD (tasks/activities executed with/by the PDS, contexts, intensity, frequency); (2) problems/difficulties encountered with the PSD; (3) perceived advantages and disadvantages of having a PSD (safety/functional independence); and (4) personal opinion about the service dog programs. Verbatim of the recordings were transcribed. The content of the interviews was analysed with an inductive approach: units of meaning were categorized with [themes] related to questions 1 to 4.

Results: [Uses of PSD]: walking outside with the dog (~3x/day if living in an apartment) and integrating the dog in the therapeutic process (~1x/week) in order, for example, to help dealing with exposure in larger crowds. [Problems]: Costs related to dog maintenance (e.g. $10,000 surgery), possible sickness/death of the dog, and negative reaction encountered from employees in shops. [Benefits]: Less hyperarousal over time and more comfort in public, feeling secured by the presence of dog. Caring for the dog helps with socialization (veterinarian, grooming). Veterans developed a sense of competence while caring for the dog. Veterans reported reduction/stabilization of their medication intake. Frequency, duration and comfort in public are improved. [Disadvantages]: To be asked why they have a PSD and having to subsequently reveal their mental health problems. [Programs]: All Veterans appreciate their dog but suggest that access to programs should be enhanced and a registry of PSD created. More coherence regarding criteria and standards between programs would provide more credibility for PSD qualification.

Conclusion: Combined with scientific evidence supporting the effectiveness (quasi-experimental research currently underway), those research themes will help in the preparation of guidelines for health professionals who may want to look into the relevance of providing a PSD for a sub-group of Veterans with PTSD.

1C06: Cognitive Processing Therapy for PTSD: What Does the Evidence Say?

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Introduction: The first priority in the Surgeon General's 2013 five-year Mental Health Strategy is the optimization of health outcomes for patients. To that end, the Canadian Armed Forces (CAF) established a Mental Health Treatment Standardization Committee to develop policies on standardized, evidence-based care for military personnel. The Committee has begun by reviewing the mental health treatments offered by the Forces to determine if current evidence supports these interventions as best practices.

The first intervention selected for review was Cognitive Processing Therapy (CPT), a manualized therapy, based on elements of cognitive behavioural therapy, for the treatment of post-traumatic stress disorder (PTSD).

Methodology: The CAF engaged the Canadian Agency For Drugs And Technologies In Health (CADTH) to conduct a systematic review and meta-analysis of published evidence on CPT. The question: Should cognitive processing therapy versus no treatment controls or other therapies be used for patients with PTSD? At the Committee's request, CADTH included in the review Grading of Recommendations Assessment, Development and Evaluation (GRADE) tables, which rate the strength, or reliability, of the evidence. Translating the GRADE tables into GRADE's "evidence to decision framework" supported the Committee in reaching a consensus recommendation.

Results: The systematic review concluded that, based on moderate to low quality evidence, CPT may be more effective than wait list or usual care in reducing the severity of PTSD, depression, and anxiety symptoms in adults.

There was moderate quality evidence for important short term benefits of CPT over no treatment. More research is need to determine long term benefits. There was low quality evidence for similar benefits of CPT compared with Prolonged Exposure Therapy, Present-centered Therapy, or Memory Specificity Training.

The evidence reviewed included military personnel and civilians; CPT appeared to be similarly effective across populations. There was insufficient evidence to determine whether group or individual therapy should be provided over the other, and therefore CPT can be provided in either mode.

The effectiveness of CPT may be based on strict adherence to the manual. Strategies to ensure compliance to the manual may be needed.

Conclusion: Based on the review and guided by GRADE methodology, the Mental Health Treatment Standardization Committee recommends providing CPT to patients with PTSD over no treatment, a strong recommendation, based on moderate quality evidence.

2A02: Deployment-Related Traumatic Events and Suicidal Behaviors in a Nationally Representative Sample of Canadian Armed Forces Personnel

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Introduction: Worldwide, there has been substantial controversy with respect to whether military deployment is a risk factor for suicidal behavior. Most studies have found no association between deployment and suicide risk; while other studies examining specific traumatic events during deployments have found larger associations with suicidal behavior.

Objectives: To examine the relationship between lifetime exposure to deployment-related traumatic events (DRTE) and past-year suicidal ideation (SI), plans (SP) and attempts (SA).

Methodology: Data, Setting and Participants: Data were analyzed from the 2013 Canadian Forces Mental Health Survey (8161 respondents; response rate, 79.8%; age 18-60 years old).

Main Measures Outcomes: A total of 12 individual items assessed exposure to traumatic events during deployment (e.g., combat, witnessing human atrocities, feeling responsible for the death of Canadian or ally personnel, knowing someone who was injured or killed). We examined each individual DRTE type as well as the number of types

of DRTEs in relation to suicidal behavior. World Mental Health Survey Composite International Diagnostic Interview was used to assess mental disorders and past year SI, SP, and SA. Child abuse included physical abuse, sexual abuse, and exposure to intimate partner violence (IPV).

Results: In models adjusted for sociodemographic variables, most of the individual DRTE items and the DRTE count variable were significantly associated with suicidal behaviors (adjusted odds ratio ranged between 1.10 to 5.32). When further adjusting for child abuse exposure, these associations were minimally attenuated, and some became non-significant. In final models also adjusting for mental disorders, the vast majority of DRTEs and number of types of DRTEs became non-significant in relation to SI, SP and SA.

Conclusion: Active military personnel exposed to increasing number of DRTEs are at increased risk for SI, SP, and SA. However, most of the association between DRTE and suicidal behavior is accounted for by child abuse exposure and mental disorders.

2A03: PTSD and Comorbidity in Treatment Seeking Veterans

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Introduction: Currently-serving military personnel and veterans are at significant risk for posttraumatic stress disorder (PTSD) and other mental health conditions including major depressive disorder (MDD), generalized anxiety disorder (GAD), panic disorder (PD), alcohol use disorder, and drug abuse disorder, making this a highly comorbid population. Some research suggests that the prevalence of these conditions significantly differ based on age, sex, and deployment to Afghanistan. Furthermore, studies indicate that symptom profiles of currently-serving military personnel and veterans can be categorized based on the degree of comorbidity. We examined our treatment-seeking population of Canadian Forces (CF) members and veterans to determine prevalence of probable mental health conditions, symptom clusters, and factors associated with class membership.

Methodology: Canadian Armed Forces (CAF) members and veterans younger than 65-years-old who sought treatment at Parkwood Institute's Operational Stress Injury Clinic and completed intake questionnaires from September 2006-September 2014 were included in this study (N=538). The Patient Health Questionnaire (PHQ) was used to determine probable MDD, GAD, and PD; the Alcohol Use Disorders Identification Test (AUDIT) determined probable alcohol use disorder; the Drug Abuse Screening Test (DAST) determined probable drug use disorder; and the Posttraumatic Stress Disorder Checklist – Military Version (PCL-M) determined probable PTSD. We used descriptive analyses to estimate the frequency of mental health conditions and demographic information; latent class analysis (LCA) to determine symptom profiles with number of deployments, age, and sex included as covariates; and logistic regression to determine factors associated with class membership.

Results: Results showed high levels of comorbidity with over 75% of participants having more than one mental health condition, the most common being PTSD (71.6%) followed by MDD (64.5%). LCA revealed two symptom profiles: a high comorbidity class (67.8%) in which members were likely to have PTSD (92.6%), MDD (89.6%), GAD (66.3%) and PD (66.0%); and a low comorbidity class (32.2%) in which members

predominantly had alcohol use disorder (34.7%) with a relatively low comorbidity of everything else. Older participants had significantly higher odds of being in the high comorbidity class compared to younger participants. Neither sex nor number of deployments were significant predictors of class membership.

Conclusion: Our results demonstrate a high rate of comorbidity among treatment-seeking CAF members and veterans, particularly among those with PTSD. Our finding highlights the importance of assessing and treating comorbidity in treatment seeking patients.

2A04: Deployment Stress, Post-deployment Reintegration, and PTSD Symptomatology in CAF Reservists

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Department of National Defence

Introduction: There is ample evidence linking deployment-related stress to negative psychological outcomes including post-traumatic stress (PTSD). Equally important are individuals' post-deployment reintegration experiences. More specifically, if individuals have negative post-deployment reintegration experiences at work, with their families, or personally, what effect does this have on their health and well-being (e.g., Cohen et al., 2015)? Alternatively, if having returned from a deployment, an individual develops PTSD symptoms, does this negatively affect the process of reintegrating with their family, at work, or personally?

Both of these potential relationships presuppose that individuals have experienced varying degrees of deployment-related stressors. Following from this, one hypothesis is that the experience of deployment-related stressors may contribute to poorer reintegration experiences which ultimately impacts on PTSD symptomatology. An alternative hypothesis is that the experience of deployment-related stressors contributes to the development of PTSD symptomatology which in turn can impact on the type of experiences individuals have post-deployment (i.e., more negative experiences).

Accordingly, the purpose of this research is to assess the viability of these two potential approaches to understanding the relationship among deployment stress, post-deployment reintegration experiences, and PTSD symptomatology in CAF Reservists approximately six months following a deployment to Afghanistan.

Methodology: The viability of both approaches was assessed through the use of regression analyses to test for statistical mediation. This methodology was used due to a smaller sample size (N = 106) and the exploratory nature of the research.

In the first set of analyses predicting PTSD symptomatology, deployment stress (i.e., overall or most stressful event) was entered into the regression equation prior to one of six post-deployment reintegration domains (i.e., positive or negative: work, personal and family). These analyses were re-run. In this instance, each of the six post-deployment reintegration domains was used as a criterion variable, while PTSD symptomatology replaced post-deployment reintegration as a potential mediating variable.

Results: Preliminary results from multiple regression analyses indicate that, negative post-deployment reintegration experiences in the family, work, and personal domain partially mediated the deployment stress-PTSD symptomatology relationship. As well, PTSD symptomatology partially mediated the relationship between deployment

stress and negative post-deployment reintegration experiences.

Conclusion: Preliminary evidence was obtained for the viability to both approaches to understanding the interrelationships among deployment stress, post-deployment reintegration experiences and PTSD symptomatology in a Canadian military Reserve context.

Future research should test these interrelationships prospectively and assess the possibility of a bi-directional relationship between negative post-deployment reintegration experiences and PTSD symptomatology.

2A05: Using Interpersonal Circumplex Theory to Understand and Address Deployment-related Changes in Interpersonal Style

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Introduction: Many symptoms of posttraumatic stress disorder (PTSD) have an interpersonal dimension (e.g., irritable behavior and angry outbursts) or interpersonal consequences (e.g., persistent inability to experience positive emotions). At the Parkwood Institute Operational Stress Injury Clinic, where most of our clients present with military-related PTSD, we commonly hear from both service personnel and their spouses that individuals have been "changed" by their deployment experiences - e.g., that they have become "cold" or "angry all the time." Clinical experience suggests that framing these interpersonal changes in terms of Interpersonal Circumplex (IPC) theory (e.g. Kiesler, 1983; Leary, 1957; Wiggins, 1982) can be a useful exercise for these clients. We are currently investigating the clinical utility of IPC theory in a pilot study using primarily qualitative (semi-structured interview) methodology. We propose to present on the study rationale, design, and preliminary results.

Each of the several versions of IPC theory posits that there are two primary dimensions to social behavior: affiliation (hostility/warmth) and power (dominance/submissiveness). Interpersonal styles are held to be *complementary*, in that they "pull" predictable responses from others. The affiliation dimension is held to elicit *corresponding* or matching behavior while behaviours on the power dimension are held to elicit *reciprocal* responses.

In therapy conversations about the IPC model, clients often describe a shift toward marked hostile dominance on tour, and a tendency to get "stuck" in this mode post-deployment, or to "lose control of the switch," such that they find themselves flipping into this mode even when they can see the harm it does to their relationships. Anecdotally, these discussions seem to help clients contextualize and normalize interpersonal shifts, reflect on how their interpersonal behaviour might be eliciting unwanted responses from others, and generate ideas about how to make small behavioural shifts in valued directions.

Methodology: Participants (expected n=20) are OSI Clinic clients who have completed at least one deployment involving trauma exposure. A newly developed semi-structured interview is used to assess the nature, timing, and persistence of self-reported tour-related interpersonal changes. Clients anonymously report on the value of these discussions. Transcribed interview responses are coded by independent raters. Quantitative client satisfaction ratings are summarized in descriptive statistics.

Results: Preliminary results to be presented at Forum.

Conclusion: With this pilot project, we hope to gather preliminary evidence for the utility of a brief (perhaps single session) module based on IPC theory to be used adjunctively with established broad-based treatments for military-related PTSD.

2B01: Couples Overcoming PTSD Every Day (COPE): Summative Evaluation of an Innovative PTSD Program for Military Veterans and Their Spouses

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University of Victoria

Introduction: The COPE Program (Couples Overcoming PTSD Every Day) is an innovative psycho-educational, group counselling program developed at the University of Victoria with Lt. Colonel (Retd) Chris Linford and his wife Kathryn, along with a team of professional facilitators and researchers. The COPE program consists of a 5-day residential retreat with 5 couples, followed by a 6-month coaching program to assist couples in learning to deal more effectively with PTSD in their relationship. In 2015, the founders conducted formative evaluations of the program over 12 months to refine the COPE program. The feedback from participants and facilitation teams in 2015 provided Dr. Black and his program facilitators with details on how COPE could be improved with each iteration. The curriculum and process were finalized in the fall of 2015 with no further changes to the program. In 2016, Dr. Black is conducting summative evaluations to determine if the COPE program is meeting its goals of decreasing social isolation, increasing coping skills, decreasing loneliness and improving the couples' relationships. Data for 2016 serials of COPE delivered across Canada will be presented and implications for future programming discussed. The COPE program is the only program of its kind to date in Canada and provides an important addition to the suite of programs for veterans by focusing on the family's role in healing from PTSD.

Methodology: Couples are asked to fill out baseline, pre and post-test measures as well as 6 and 12 month follow up measures. Descriptive statistics will be presented along with correlational analyses and between group comparative data for each member of the dyad.

Results: Data is currently being collected for all serials including follow up data for the first serials of the program delivery.

Conclusion: As data is still being collected, there are no formal conclusions at this point. All data will be collected prior to CIMVHR 2016 and will be presented at that time.

2B02: Married to the Malady: Impact of OSIs on Spousal Relationships

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Introduction: Operational stress injury (OSI) encompasses posttraumatic stress, anxiety, depression, and substance use among other disorders, and may develop after a traumatic event, combat, grief or loss, high stress situations, or from operational fatigue. The effects of OSI on the family system by and large focus on posttraumatic stress disorder (PTSD) more than any other mental health or psychological effect. One in five Canadian veterans will experience some diagnosed mental health concern (most commonly depression, anxiety, or PTSD) within

their lifetime (Veterans Affairs Canada, 2015). Further, about one in six full-time Regular Force members report symptoms of a mental health disorder (Pearson, Zamorski, & Janz, 2014). This significantly complicates family roles, particularly for spouses.

Previous research has found that partners of veterans with PTSD report greater hostility and general distress (Glenn et al., 2002); psychological and relationship stress (Renshaw, Rodebaugh, & Rodrigues, 2010); and more severe problems in marital and family adjustment, parenting skills, and violent behaviour (Jordan et al., 1992; MacDonald, Chamberlain, Long & Flett, 1999). On a promising note, however, partnered soldiers recently returned from deployment have shown to express concern about getting along with their partners, and show a preference for family-based interventions over individual therapy (Khaylis et al., 2011). The purpose of this study was to explore the impact of OSI on the spousal relationship of Canadian Armed Forces (CAF) veterans, Regular Force, and Reserve Force members.

Methodology: CAF families were recruited to participate as part of a larger study on the strengths of military families. Families were eligible if they had a parent who served in the CAF within the past 5 years as a Regular or Reserve Force member and if they had at least one child between the ages of 6-18 living in the house. Parent participants completed a survey of their current mental health symptomology, including questions about their relationship with their spouse.

Results: Preliminary results will be presented.

Conclusion: In addition to existing and ongoing qualitative studies examining the spousal relationship, the results of this study will inform programming to enhance the resilience of this unique population.

2D01: Briefing of the Peer Support and Crisis Intervention Programs in First Responders: A Review

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University of Regina

Introduction: Relative to the general population, first responders (i.e., police, firefighters, paramedics) are at higher risk for psychological difficulties because of repeated exposure to potentially traumatic events. Several efforts have been made attempting to mitigate such risks, including various peer support and crisis intervention programs. Despite such efforts, there has been limited research and review informing the effectiveness for such programs. The current presentation will provide an overview of a recently completed report (i.e., Red Paper) that detailed a literature review and pan-Canadian survey of Canadian first responder agencies.

Methodology: The report was commissioned by the developing Canadian Institute for Public Safety Research and Treatment, and completed by a team of 12 researchers before being evaluated by seven peer-reviewers. The review assessed the current state of research evidence for Peer Support and Crisis Intervention Programs in Canadian First Responders. The review included searches of several established research databases (e.g., Cochrane Review, PsychInfo, Proquest) in both English and French. The bilingual survey assessed the breadth and depth of implementation for such programs among Canadian first responder agencies. The national executive organizations for first responders (i.e., Canadian Association of Chiefs of Police, Canadian Police Association, Canadian Association of Fire Chiefs, International Association of Fire Fighters, Paramedic Chiefs of Canada, Paramedics Association of Canada) emailed all registered first responder leaders across Canada, inviting them to complete a brief online survey asking about the Peer Support and Crisis Intervention Programs implemented by their agency. A total of 229 participants (i.e., 28% police, 14% fire and rescue, 28% paramedics, 14% other) completed at least some portion of the survey.

Results: The review results indicated a substantial gap in current research related to such programs for first responders; specifically, while the programs are perceived as helpful, there is little to no evidence the programs are effective for mitigating significant mental health concerns (e.g., operational stress injuries). Results from the survey indicate substantial variability in outcome measures, expectations, and implementations of such programs.

Conclusion: The authors recommend modifying expectations for such programs and facilitating rigorous outcome research to better inform decisions regarding program implementation. The report is the first of its kind in Canada. Implications and directions for future research will be presented.

2D02: Posttraumatic Stress Disorder among Firefighters: A Scoping Review

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Queen's University

Introduction: Mental illnesses, specifically Post-traumatic stress disorder (PTSD), anxiety and depression, are major contributors to disability. Due to stigma, many individuals with these disorders tend to hide their symptoms for as long as possible.

While the research literature suggests that PTSD is a potential problem in members of the military, there is less information on PTSD in other potentially at-risk populations, including public safety and emergency response workers (e.g., firefighter, police officer or paramedic). As first responders, firefighters have high exposure to trauma and proximity to personal peril through their response to medical emergencies, natural disasters, high-angle rescue, trench rescue, marine disaster, hazardous materials events, violent crime, and fire. This exposure places them at risk for PTSD, which has widespread implications across settings such as the workplace and home. The purpose of this scoping review was to identify and describe international research literature related to PTSD among firefighters.

Methodology: A scoping review was conducted using methodology outlined by Arksey & O'Malley (2005) to identify and synthesize knowledge on PTSD among firefighters. The databases used included CINAHL, MEDLINE, PsycINFO, EMBASE, and Cochrane Library, as well as reference mining.

Results: A total of 809 articles published between 1990-2015 were identified as potential data sources, with the research team ultimately extracting data and coding themes from 99 articles. A large number of the studies were conducted in the United States. Studies also emphasized reporting the prevalence of posttraumatic stress symptoms and causes of trauma exposure. Three themes were identified through a synthesis of the literature include: understanding PTSD among firefighters; describing the nature of trauma exposure; and developing approaches to deal with PTSD among firefighters.

Conclusion: Given the divergent findings related to prevalence and

mechanisms of trauma exposure, secondary analysis will be necessary. Other areas of future research include the nature, structure, and efficacy of system-level mental health services to prevent and manage mental health issues associated with trauma exposure. This information can help inform health care providers who can collaborate with and educate the workplace on ways to provide the appropriate services to support firefighters' mental health and well-being.

2D04: Laying the Foundation for Change: An Analysis of a Survey of Paramedic Mental Health in Ottawa

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Introduction: First responders encounter significant work-related stressors and higher rates of critical stress incidents in comparison to the general population. Exposure to such incidents increases the risk of mental health illnesses such as Post-Traumatic Stress Disorder (PTSD) and the development of suicidal thoughts. A review of the literature reveals a lack of research investigating the mental health of first responder populations, especially within the Canadian context. As a first step in addressing this problem, we conducted a survey of paramedics from the Ottawa Paramedic Service. The objective of the current analysis was to address the barriers currently impeding help-seeking behaviours, incidents of critical stress, suicidal thoughts and behaviours, and providing a preliminary evaluation of the Ottawa Paramedic Service's Peer Support Group program.

Methodology: The survey was designed to explore exposures and responses to traumatic incidents and the overall mental health of the paramedic workforce. It was administered by Peer Support Group members during training sessions for paramedics. Being the first of its kind in the Ottawa region, the survey provided a baseline evaluation of paramedic mental health.

Results: The survey was completed by four hundred and twenty-seven paramedics from the Ottawa Paramedic Service. Preliminary results highlight that paramedics having served between 0-35 years of service have an increase in exposure to work-related incidents of critical stress in line with number of years served. Seven out of 10 respondents reported having experienced critical stress. Grouped results noted: 17.1% of respondents had received a clinical diagnosis of depression; and 10.3% had received a clinical diagnosis of PTSD across their lifetime. Of note, 22.5% reported suicidal thoughts, with 3.0% having made at least one previous suicide attempt. 8.9% were treated with Cognitive Behavioural Therapy and 16.2% disclosed antidepressant use.

Conclusion: The rates of depression, suicidal thoughts and PTSD in paramedics are higher than that found in the general population. In an effort to combat and reduce rates of suicide and self-harm in high risk populations across the Champlain Local Health Integration Network, a cohesive collaboration amongst the first responder organizations at the Municipal, Provincial and Federal levels in Ottawa, Ontario, joined together and are actively creating a research strategy to address this problem. The results of the preliminary survey are informing a larger scale survey of the City of Ottawa's tri-services.

2D05: First Responders and Return to Work: A Recovery-oriented Treatment Program for First Responders with Traumatic Psychological Injury

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OrionHealth Assessment and Rehabilitation Centre

Brief Description: Our clinical program supports First Responders (e.g. Firefighters, City Police, Emergency Medical Services Personnel; Correctional Officers) to recover from their traumatic psychological injuries. Clients attending program are assessed by a registered psychologist, a provisional diagnosis is made, and treatment recommendations are provided. Diagnoses range from Posttraumatic Stress Disorder, Acute Stress Disorder, Adjustment Disorder, Other Trauma-and-Stressor-Related Disorders, along with comorbid diagnoses. Our program addresses both cumulative, complex trauma and single traumatic incident events, and runs 8 to 16 weeks. A client-centered, employer-supported approach to return to work coordination is viewed as a key success factor.

Our approach includes cognitive and emotional processing using interventions such as: Exposure Therapy Protocols, Cognitive Behavioural Therapy, and Mindfulness-Based Therapies; physical and behavioural activation; goal setting related to occupational performance issues across domains of life; relaxation training; physiological arousal and nervous system response to stress; sleep hygiene, and psychoeducation on such topics as: common reactions to trauma; recovery; resilience; coping strategies and protective factors specific to the environment in which they are working; neuroplasticity, physiological arousal, and the nervous system; and return to work. Our collaborative, interdisciplinary team includes a psychologist and occupational therapist and, depending on client need, a physiotherapist and kinesiologist.

Clinical Outcomes: In the past year, 23 First Responders have participated in program. The outcomes of treatment include: Increase resiliency by increasing protective factors; Decrease symptoms of anxiety and trauma in clients; Facilitate ability to function in various environments and participate in meaningful occupations including self-care, leisure, and productivity; and optimize functional ability to return to sustainable employment with adaptive coping strategies to manage trauma and anxiety symptoms. Outcomes are measured through subjective, self-reports of clients, objective standardized measures pre and post program, clinical observation, and return to work outcome. Data on return to work outcomes and psychosocial scoring will be presented.

Patient Population: Our clinical population includes First Responders primarily serving in Calgary, AB and include: Firefighters (NOC: 4312), Police Officers (NOC: 4311), Paramedics (NOC: 3234), Emergency Medical Technicians (NOC: 3234), STARS Air Ambulance teams (NOC: 1475), and Correctional Officers (NOC: 4422).

Conclusion: Based on the clinical outcomes of program, First Responders participating in a comprehensive, interdisciplinary Return to Work treatment program are seen to recover from their Traumatic Psychological Injuries and return to meaningful occupations of life.

2E01: Positive Functioning and Emotional Well-being among Canadian Armed Forces Personnel with and without a Child Abuse History

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Introduction: Approximately 47.7% of the Canadian Armed Forces (CAF) Regular personnel compared to 32% of the general Canadian population have indicated that they have experienced physical abuse,

sexual abuse, or exposure to intimate partner violence in childhood (Afifi et al., 2016). Child abuse can have devastating mental health consequences. Fortunately, not all individuals exposed to child abuse will suffer from poor mental health. Our objectives were to: 1) describe the prevalence of overall positive functioning and emotional well-being among CAF personnel with and without a child abuse history compared to the general population; 2) examine the relationships between child abuse and positive functioning and emotional well-being among CAF personnel compared to the general population; and 3) among the CAF personnel, examine the individual items of the positive functioning and emotional well-being scale and determine if differences exists among those with and without a child abuse history.

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%). Child abuse includes physical abuse, sexual abuse, and exposure to intimate partner violence. Positive functioning and emotional well-being was assessed using the 14-item Mental Health Continuum – Short Form (MHC-SF) based on the work of Keyes. We applied the algorithms developed by Keyes to categorize individuals in three categories: flourishing, moderate, and languishing.

Results: In the general Canadian population, approximately 77% reported flourishing positive functioning and emotional well-being, 22% reported moderate, and 2% were considered languishing. The general population findings indicate that physical abuse, sexual abuse, exposure to intimate partner violence, and any child abuse were associated with increased odds of poorer past month positive functioning and emotional well-being. Data for the CAF sample and statistical comparisons to the Canadian general population are forthcoming.

Conclusions: The findings from this study have several important clinical implications. If positive functioning and emotional well-being is lower among respondents with a child abuse history compared to those without a child abuse history, then understanding specific differences with regard to positive functioning and emotional well-being may have treatment implications for CAF personnel who are seeking care for mental health problems.

2E02: Help Seeking, Perceived Need for Care, and Barriers to Care for Alcohol use Disorders in Military Personnel and the General Population in Canada

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Introduction: Alcohol use has long been utilized as a means for individuals to cope with a wide variety of stressors. However, the relationship between problematic alcohol use and help seeking behaviours among military personnel is an understudied area of research, particularly pertaining to the Canadian Armed Forces (CAF). As well, help seeking behaviour, perceived need for care, and perceived barriers to care among military personnel with alcohol use disorders likely differs from that of their civilian counterparts in the Canadian context due to differences in mental health service delivery across the two populations. Therefore, our primary objectives were to: (1) compare the prevalence and correlates of past-year alcohol abuse and dependence in the CAF and the Canadian general population (CGP); and (2) compare the prevalence and correlates of help seeking, perceived need for care,

and barriers to care among respondents with alcohol use disorders in the CAF and the CGP.

Methodology: Data were from two nationally representative surveys collected by Statistics Canada: (1) the Canadian Community Health Survey on Mental Health collected in 2012 (N=25,113; response rate=68.9%), and (2) the Canadian Forces Mental Health Survey collected in 2013 (N=8,161; response rate=79.8%). Both surveys used similar methodologies and measures, and were designed to allow for comparisons across surveys. Analyses were restricted to respondents 18 to 60 years of age to maintain age comparability across populations. Additionally, only serving Regular Force CAF personnel were included in analyses.

Results: The prevalence of past-year alcohol abuse and dependence was 3.8% in the CGP (5.6% for males and 2.1% for females) and 4.5% in the CAF (4.9% for males and 2.3% for females). The prevalence of professional help seeking among CAF personnel with alcohol use disorders was substantially higher (2 to 3 times higher across types of professionals seen in past-year) than the prevalence of help seeking in the CGP. Findings regarding correlates (e.g., sociodemographics, mental disorders, child abuse history), professional help seeking, perceived need for care (e.g., no need vs. need; needs met vs. unmet), and barriers to care (e.g., attitudinal, structural) are forthcoming.

Conclusion: Information regarding correlates of alcohol use disorders and factors that influence help seeking behaviours among people with alcohol use disorders can be used to develop more targeted prevention and intervention strategies aimed at increasing help seeking and reducing barriers to care for alcohol use disorders in Canada.

3A01: MDMA-assisted Psychotherapy for Treatment of Chronic PTSD: Findings from MAPS-sponsored Phase 2 Clinical Research Trials

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Multidisciplinary Association for Psychedelic Studies

Introduction: The Multidisciplinary Association for Psychedelic Studies (MAPS) has completed six sponsored Phase 2 clinical pilot studies that investigated MDMA-assisted psychotherapy for treating chronic, treatment-refractory posttraumatic stress disorder (PTSD).

Methodology: At five study sites world-wide, 108 subjects underwent a series of non-drug preparatory and integration sessions, interspersed with two or three double-blind, MDMA-assisted psychotherapy sessions with a comparator/placebo control. One of these studies in Charleston, South Carolina (MP-8) specifically enrolled 26 veterans, fire fighters, and police officers with a diagnosis of chronic PTSD, while the other studies enrolled subjects with PTSD caused by any type of traumatic event, e.g. sexual assaults, childhood abuse, accidents, or war. Subjects were administered the Clinician Administered PTSD scale (CAPS-4), Beck's Depression Inventory (BDI-II), and the Pittsburg Sleep Quality Index (PSQI) at baseline and after undergoing the series of therapy sessions. Vitals and adverse events were monitored to gather safety of MDMA in a PTSD population in clinical setting.

Results: Intent-to-treat findings from these studies showed medium to large between-subjects effect size in reducing PTSD symptoms after two sessions, as measured by the Clinician Administered PTSD Scale (CAPS-4), with a good safety profile. In addition, preliminary results indicate an improvement in depression and quality of sleep.

Conclusion: These positive results provide a basis for the continuation of the MAPS-sponsored research program into expanded Phase 3 clinical trials to provide safety and efficacy data for use of MDMA as a pharmacological adjunct to therapy for treatment of PTSD. Given the limited effectiveness of current available medications and therapeutic strategies in some people, MDMA-assisted psychotherapy holds promise as a novel treatment option and warrants further study.

3A02: Changes in Patient Reported Outcomes in War Veterans with Post-traumatic Stress Disorder using Medical Marijuana

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Introduction: Post-Traumatic Stress Disorder (PTSD) is a mental illness related to a traumatic event. It is a severe disorder which can be chronic and can result in disabilities at the social, occupational and interpersonal level. PTSD symptoms are intrusive symptoms such as flashbacks, avoidance symptoms, and arousal symptoms (anger). PTSD is treated with pharmacotherapy and psychotherapy. However, many do not respond to these treatments. The objective of this study is to describe changes in patient-reported outcomes (PRO) and psycho-active medication consumption of war veterans with PTSD undergoing treatment with medical marijuana.

Methodology: We conducted a single centre review of war veterans diagnosed with PTSD who had failed standard pharmacotherapy and psychotherapy and were managed with medical marijuana. PRO and medication use was assessed at baseline and at a follow up visit (3-18 months). Patients rated PTSD symptoms, the impact of PTSD on social and family life, and pain severity on a ten point scale, where 10 is the most negative. We analyzed changes in PRO from baseline to follow-up and changes in psychoactive medication use, and report percent change and magnitude of effect, as measured by effect size (ES).

Results: Patients were primarily male (97%) and on average 43 years old. The mean score for all PTSD symptoms showed significant improvement from baseline to follow-up. The aggregate score of PTSD symptoms improved from a mean score of 7.0 to 2.9 (59% reduction, ES 1.5, very large effect). Notably, suicidal thoughts decreased from a baseline score of 4.1 to follow-up score 0.9 (77% reduction, ES 1.0, large effect). Aggregate score for social impacts improved from 6.6 to 2.7 (59% reduction, ES 1.2, large effect). Specifically drug and alcohol overuse mean score decreased from 6.0 to 1.1 (82% reduction, ES 1.4, very large effect) and marital/relationship harmony improved from 8.1 to 2.8 on average (65% reduction, ES 2.6, very large effect). Pain severity decreased from an average of 6.6 to 3.4 (48% reduction, ES 1.5, very large effect). Patients on psycho-active medications reduced consumption by 50% from baseline to follow-up.

Conclusion: Initiation of medical marijuana in war veterans with PTSD who had failed conventional therapy resulted in significant improvements across all PTSD symptoms as well as social and family outcomes and pain severity. There was a 50% reduction in the consumption of psycho-active medications.

3A03: Medical Cannabis in the Treatment of PTSD (Part 1 of 2)

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Introduction: In 2014 Health Canada replaced the Marihuana for Medical Access Regulations (MMAR) with the Marihuana for Medical Purposes Regulations (MMPR). This presentation will provide a brief review of Canada's medical cannabis program, and will examine past and present research on the use of medical cannabis in the treatment of stress, anxiety, depression, PTSD and problematic substance use. This will include data from the first comprehensive survey of patient experiences, patterns of use and cannabis substitution effect as self-reported by patients enrolled in Canada's federal medical cannabis program, with a focus on the treatment of PTSD, problematic substance use, and other mental health conditions.

Methodology: This presentation will review published and pre-publication research on medical cannabis, with a focus on a recent patient survey conducted by Tilray, a federally authorized Licenced Producer of medical cannabis. In order to learn more about patient experiences with medical cannabis and the MMPR, a 107 question online survey was made available to Tilray patients in July 2015 in French and English. The survey included questions on patient demographics, patterns of use, and cannabis substitution effect, and gathered 301 responses.

Results: Research suggests that medical cannabis is primarily being used as a treatment for chronic pain and mental health. Results from Tilray's patient survey suggests a high self-reported use of cannabis as a substitute for prescription drugs (63%), particularly pharmaceutical opioids (31%), SSRIs (12%) and benzodiazepines (11%). Patients also reported substituting cannabis for alcohol (25%), cigarettes/tobacco (12%), and illicit drugs (5%).

Conclusion: These findings suggest that medical cannabis is primarily used to treat chronic pain and mental health issues like PTSD, stress, anxiety and depression, and may be an effective adjunct or substitute treatment to prescription drugs used to treat these conditions. Clinical research on medical cannabis and PTSD taking place in Canada and the US should provide further data on the safety and efficacy of medical cannabis in the treatment of mental health issues.

3A04: Medical Cannabis in the Treatment of PTSD (Part 2 of 2)

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Introduction: The potential for cannabis to treat symptoms associated with PTSD has been the subject of considerable recent attention, and calls have been made for further investigation of this area. Interest in the therapeutic potential of cannabis for PTSD is bolstered by retrospective reports of cannabis use-related reductions in PTSD symptoms (Greer et al. 2014) and community studies that report associations between PTSD and cannabis use (Cougle et al. 2011). However, due largely to barriers to conducting trials with herbal cannabis, clinical research on the efficacy of cannabis for PTSD is only now getting underway. We describe the biological, psychological and social research that provides the rationale for examining cannabis as a treatment for PTSD, and report on the progress of the first clinical trial of cannabis for PTSD, that is currently underway by our group.

Methodology: After initial screening, including two weeks of verified non-use, vaporized cannabis containing 3 different ratios of D9-tetrahydrocannabinol (THC) and cannabidiol (CBD) will be tested in 3 distinct

study stages. In Stage 1, 42 participants will be randomized to one of three cannabis conditions based on cannabinoid content: High THC/Low CBD (*High THC*), High THC/High or Low THC/Low CBD (*placebo*). Stage 1 will last for 3 weeks, during which time participants will be allowed to self-administer up to 2 g of cannabis daily via vaporization. Following a 2-week washout period of biochemically confirmed cannabis abstinence; participants will be randomized to one of the 2 "active" cannabis conditions (High THC, and THC/CBD) for Stage 2. Drug assignment for Stage 2 will be conducted such that the drug condition will be different than that assigned in Stage 1. Stage 2 will permit a within-subjects comparison of symptom change and personal preference as a function of cannabis type. To discourage diversion of unused cannabis and encourage participant use of in a naturalistic ad-lib fashion, unused cannabis from Stage 1 and 2 will be offered to participants in an optional Stage 3 that will occur during the first 2 months of a 6-month follow-up period.

Results: Recruitment is anticipated to begin in May 2016.

Conclusion: This presentation will detail the study design and implementation through the first 6 months of activity.

3B01: Military Strong: Youth Developmental Assets in Families with Parental OSI

Schwartz, K.D., PhD; Stelnicki, A., MSc; Wheeler, B., BA

University of Calgary

Introduction: Of the small but growing research literature related to children and youth who live in military families, much of it takes a deficit-based approach (Chartrand et al., 2008; Jensen et al., 1996). As such, the findings seem to suggest that children in military families are perpetually at-risk for emotional and behavioural simply because they may face extraordinary stressors unique to military families (e.g., family moves, parental deployment). On the contrary, more recent data that focuses on strengths developmental assets or trajectories of positive development suggests that children and youth have the capacity to both cope with adversity and to thrive (Easterbrooks et al., 2013). Specific to youth in military families, much is yet to be discovered about the nature of assets that contribute to positive development, particularly for those children who have a parents with an operational stress injury (OSI). Thus, the present research study asks two very important questions: a) For children and youth who live with a parent with an OSI (e.g., PTSD), are there differences in self-reported developmental assets compared to those youth who do not reside with a parent with OSI? b) Are there differences in the how developmental assets predict specific outcomes (e.g., emotional functioning) based on whether the child has a parent with an OSI?

Methodology: Youth of military families (ages 11-18) completed the 58-item Developmental Assets Profile (Search Institute, 2005) that measures both internal and external development assets as well as contextual assets (e.g., school support). They also completed questionnaires related to their current behavioural, social, emotional, and academic functioning (e.g., school success, school confidence). Parents of the youth were asked if the serving Canadian Armed Forces (CAF) member had been diagnosed with an OSI and if he/she was actively receiving treatment.

Results: Results will be discussed with a view towards the ecological differences in families with and without a parent with an OSI. In particular, the moderating role of developmental assets that might mitigate the negative effects of having a parent with mental health issue will be presented. Discussion will explore the power of contextual assets – schools, communities, other adults – to alleviate the negative impact on social, emotional, and academic functioning.

Conclusion: The results can inform how critical programs and supports are considered and implemented for children in CAF families, particularly as they identify and nurture developmental strengths in the children and youth.

3B02: Parenting with an OSI: The Effect on Children›s Mental Health

Stelnicki, A., MSc; Schwartz, K., PhD

University of Calgary

Introduction: The impact of parental operational stress on children post-deployment has received little empirical attention. Previous research has shown that parental posttraumatic stress disorder (PTSD) may be associated with children's internalizing problems (e.g., depression, anxiety) and externalizing problems (e.g., attention and behavioural problems; Caselli & Motta, 1995; Rosenheck & Fontana, 1998; Selimbasic, Sinanovic, & Avdibegovic, 2012), however these results have not been consistent (e.g., Herzog et al., 2011). Less focus has been placed on parental depression and anxiety among military members. In general populations, parental anxiety and depression have both been associated with child maladjustment (e.g., Bogels & Brechman-Toussaint, 2006; Jacob & Johnson, 1997). Further, although Canadian veterans with PTSD are greatly concerned about their children's behaviour and affect, their PTSD symptoms may alter their ability to identify concerning behaviour and emotion in their children (Duranceau, Fetzner & Carleton, 2015).

Families of service members reporting high numbers of symptoms of PTSD (among other mental health concerns) may be at risk for developing secondary traumatic stress. This has also been referred to as secondary traumatization, intergenerational transmission of symptoms, transgenerational effects, and secondary stress. It is the purpose of this study to explore whether children who have a military parent with an Operational Stress Injury (OSI) are at a higher risk of developing their own mental health concerns, thus supporting the theory of secondary traumatic stress.

Methodology: As part of a larger study examining the strengths of military families, families were recruited to participate if they had at least one parent who had served in the Canadian Armed Forces Regular or Reserve Force within the past 5 years and at least one child between the ages of 6 and 18 living in the home. Parents completed surveys of both their own and their child's mental health symptomology. Further, if their child was over the age of 8, they completed a self-report questionnaire of their own mental health symptomology.

Results: Preliminary results will be reported.

Conclusion: It is important to examine the intergenerational effects of operational stress on the family unit. Results of this study will be important to inform programming that targets families with OSI. It is important to emphasize that the impact of OSI goes beyond the service member and impacts each family member in a unique way.

3B03: The Association between Paternal Alcohol Misuse and Childhood Emotional and Social Outcomes: A Study of UK Military Families

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Introduction: Alcohol misuse is a significant problem in United Kingdom (UK) military personnel; 67% report harmful alcohol misuse, and 5% potential alcohol dependency. Paternal alcohol dependency is an established risk factor for negative behavioural and emotional problems in children, including higher rates of hyperactivity, conduct disorder, and anxiety. However, studies examining the impact of alcohol misuse in UK military families and how additional factors such as PTSD or deployments may further exacerbate the problem do not exist.

Methodology: This cross-sectional study is a secondary analysis of data collected from the 'Children of Military Fathers with PTSD' survey conducted among UK military families. Currently serving (regulars and reserves) and ex-service fathers of children aged 3-16 were eligible. The survey measured paternal alcohol misuse with the Alcohol Use Disorders Identification Test (AUDIT). An AUDIT score of ≤7 was considered low risk, 8-15 harmful, and ≥16 hazardous. A score of ≥16 on the Severity of Alcohol Dependency Questionnaire (SAD-Q) identified moderate or severe dependency. Parental reports of child behavioural and emotional difficulties were measured using the Strengths and Difficulties Questionnaire and the Screen for Child Anxiety Related Emotional Disorders. Multivariable polytomous and logistic regression were used, accounting for survey weights and clustering. Potential interactions with paternal PTSD, child age, and child gender were evaluated.

Results: This study included 621 military fathers, of whom 5% reported no alcohol use in the last year, 41% reported low risk use, 40% harmful misuse and 14% hazardous misuse. 3% of fathers met the criteria for moderate or severe dependency on the SAD-Q. Fathers reported on the behavioural and emotional outcomes of their children (n=1044). Although rates of child behavioural and emotional issues were slightly higher in military children than the general UK population, preliminary results do not support the hypothesis that paternal alcohol misuse is associated with negative child behavioural and emotional outcomes in this sample. This was consistent across various measures of paternal alcohol misuse. We did not observe an interaction between alcohol misuse and paternal PTSD, or with child gender or age. Additional analyses are ongoing to confirm these initial findings.

Conclusion: No statistically significant associations between paternal alcohol misuse and child behavioural and emotional outcomes were reported in this study of UK military families. It will be essential to follow up these families to understand the long-term effects of paternal misuse on family infrastructure and child health, including children's risk-taking behaviour and alcohol use.

4A01: Prevalence and Profiles of Comorbidity in Canadian Armed Forces (CAF) Service Members

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Introduction: Psychiatric conditions such as posttraumatic stress disorder (PTSD) are often accompanied by other psychiatric conditions, such as major depressive (MDD) and anxiety disorders. The relationship between PTSD and other psychiatric conditions is not well understood, despite the diagnostic and treatment implications comorbidity presents. This study delineated classes of comorbidity among Canadian Forces personnel, and investigated sociodemographic and military characteristics associated with class membership.

Methodology: Data was obtained from the 2013 Canadian Forces Mental Health Survey and included a representative sample of Regular Forces personnel ($N = 6,700$). Latent class analyses identified classes of comorbidity among past-year PTSD, MDD, Panic Disorder (PD), Generalized Anxiety Disorder (GAD), and Alcohol use disorders. Multinomial logistic regression tested predictors of latent class membership.

Results: MDD was the most commonly reported past-year diagnosis (8.0%), followed by GAD (4.7%) and PTSD (5.2%). While 9.8% of personnel reported one disorder, 6.2% of personnel reported 2 or more past-year disorders. Most common, 44.0% of personnel with PTSD also reported MDD. Three classes were identified: A comorbid class with moderately high probabilities on PTSD, MDD, GAD, and PD (3.7%); an unaffected class with low probabilities on all disorders (90.7%); and a depressed only class with a high probability on MDD (5.6%). Compared to the unaffected class, members of the comorbid class were more likely to be female, to have reported 5 or more deployment-related traumatic experiences, to have sought past-year primary and speciality mental health services, but were less likely to be officers. Compared to the unaffected class, members of the depressed only class were more likely to be single/never married or separated/widowed/divorced, to have sought past-year primary and speciality mental health services, and to have experienced 2 or more types of childhood trauma. Compared to depressed only class members, comorbid class members were more likely to be 30–44 years of age, to have reported 5 or more deployment-related traumatic experiences, and to have sought past-year speciality mental health services. Finally, members of the comorbid class reported significantly higher past-month WHODAS disability scores than members of the depressed only class.

Conclusion: The results substantiate the need to screen and treat comorbid diagnoses when treating PTSD. Unexpectedly, the identification of a depressed only class draws attention to the need to boost support and programming targeting clinical depression. The identification of risk factors associated with class membership may also prove valuable for clinicians treating military-related psychiatric conditions.

4A02: Evaluation of the Canadian Armed Forces Enhanced Post-Deployment Screening Process

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Introduction: The Canadian Armed Forces (CAF) deploys service members on both domestic and foreign military operations. In 2002, the CAF implemented the Enhanced Post-Deployment Screening (EPDS) aimed at minimizing the impact of deployment-related mental health disorders and is required for personnel who deploy abroad for 60 or more days to undergo screening. However, the effectiveness of the EDPS has not been evaluated with respect to compliance, completeness of reporting of symptoms, referral rates for those with mental health problems, follow-up visits for those who do seek care, and improvements in care provided. As such, the purpose of this study is

to conduct a comprehensive evaluation of the Enhanced Post-Deployment Screening Process.

Methodology: A retrospective cohort was created to evaluate the EPDS. It included all CAF Regular Force and Primary Reserve Force personnel who were in service at any point over the period 1 January 2009 through 30 July 2012 followed until April 30th, 2016. Deployment history was determined by using the tasking database (CFTPO). Healthcare outcomes and service utilization was determined using health information system (CFHIS), Federal Claims database, and the EPDS database. Finally, mental disorder diagnoses, their clinical attribution to deployment, and other clinical variables will be abstracted by a research nurse from paper and electronic medical records of a stratified random sample of 3,000 individuals. Logistic regression models will be used to determine predictors of compliance to the EPDS program while survival analyses will be used to determine the impact of screening and time to care.

Results: The protocol for the study has been finalized, ethics approval has been received, and data extractions have been completed. For the study period, approximately 138,258 Regular Force and Primary Reserve personnel were eligible for the study. Eight-five percent of CAF members were males. The mean age of all CAF members was 38.7 years (SD 11.4). On average, each member to contributed 5.25 years of observation and the cohort collectively contributed 725,271 person-years at risk. With this large cohort, there is sufficient power to address a number of research questions including predictors of compliance and construction of survival curves to estimate the hazard ratio of those screened vs. unscreened.

Conclusion: Although data still being analyzed, this study will provide valuable information and identify opportunities for increase the efficiency of the EPDS screening program.

4A03: How Biased are our Survey Statistics? A Case Study Using Depression Prevalence in the Regular Forces

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Introduction: Depression is one of the most prevalent mental health conditions in Canadian Armed Forces (CAF) personnel, and has been linked to decreased quality of life, impaired ability to fulfill regular responsibilities, and increased risk of suicide and suicide ideation. The CAF, therefore, has a vested interest in accurately measuring the prevalence of depression in their troops, and population-based surveys remain the best available tool to do so. However, like most other epidemiologic tools, population-based surveys have some limitations that are often overlooked in standard statistical analyses.

Methodology: Data from the Health and Lifestyle Information Survey (HLIS) – a comprehensive population-based mail survey of CAF personnel – were used to estimate the prevalence of depression in the Regular Forces, using two different approaches. First, HLIS data were analyzed using standard statistical methods. Although these methods are widely used in peer-reviewed studies, they ignore the error and uncertainty caused by survey non-response, missing data, and misclassification of depression status. HLIS data were therefore re-analyzed, using rigorous methods known as "bias analysis". These advanced methods rely on repeated simulations to replicate and reverse the processes through which bias was introduced in a dataset. Bias analysis methods thus formally account for the errors and uncertainty ignored by standard statistical methods. Compared to the latter, bias analysis methods produce more accurate estimates. However, they are extremely time-consuming and resource-intensive, and their large-scale use is thus impractical.

Results: Using standard statistical methods, the prevalence of depression in Regular Force personnel was estimated at 7.6% (95% CI: 6.1%, 9.1%). Odds of depression were lower in officers than in non-commissioned members (NCMs) (odds ratio [OR]: 0.4; 95% confidence interval [CI]: 0.3, 0.6), but did not differ between males and females (OR: 0.8; 95% CI: 0.6, 1.2). With bias analysis methods, the estimated prevalence of depression in Regular Force personnel decreased to 5.3% (95% CI: 3.1%, 9.0%), but the odds ratios comparing officers to NCMs and males to females remained unchanged.

Conclusion: Despite ignoring survey non-response, missing data, and misclassification bias, standard statistical methods only slightly overestimated the prevalence of depression in Regular Force personnel, and produced accurate estimates of the relative differences in odds of depression between demographic subgroups. In this case, standard methods appeared to be imperfectly calibrated, but have excellent discrimination. The assessment of bias impact presented herein should help policy makers and program managers use results of the HLIS and other population surveys with greater nuance, confidence, and accuracy.

4B01: Developments in Veteran Health Care in the Netherlands

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Brief Description: Veterans Care has been institutionalized in the Netherlands with the Veterans Institute in 2000. This presentation will highlight some of the recent changes in the Netherlands Armed Forces and the impact this has on Veterans Care. The purpose of the presentation is to inform about the Veteran Health Care System in The Netherlands and the developments in the last 5 years. During this period not only a budget driven reduction of approximately 30% with a complete restructuring within the military health care took place. This was accompanied by a heightened attention and care for the veterans and Veteran health care from the different missions in which the Netherlands Armed Forces since 40 years took part. In the last 5 years the Netherlands Armed Forces had to absorb an annual major budget reduction cut. In this operation the decision was made to completely restructure the military health care service within the armed forces and to centralize the main health care providers. By doing so a reduction of approximately 25 - 30% in health care personnel positions was accomplished. At the same time, increased public and parliamentary attention developed which led to Veterans care law in 2012. This law now forms the basis for the set of care components and system which is currently being evaluated.

Clinical Outcomes: Quality of life Veterans.

Patient Population: Veterans

Conclusion: At the end of this presentation the Dutch System for Veterans Care will be outlined which will provide insight into the military health care components and system which addresses Veterans Health Care for active and post-active Veterans. Take away points for the coming years from a Dutch perspective will be made clear. Yet, there are existing dilemma's in Veterans Health Care that will also be presented

as well as the international perspective and need for cooperation.

4B02: New Research Initiatives in Military Mental Health in Dutch Armed Forces

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Brief Description: In 2000, five years after Srebrenica, there was an urgent need for a research infrastructure that could help understand the clinical framework of PTSD. This was needed in the background of an increased demand for clinical interventions in a population of servicemen that were affected by the war in former Yugoslavia and was aimed at contributing to enhanced knowledge and provide justification for the clinical demand of servicemen in the Netherlands. The start of a design of an infrastructure for PTSD studies with a team of experts in 2001 first led to a series of cross-sectional studies aimed at better understanding the nature of the disorder. In the years that followed several initiatives were started that focused on biological framework of deployment-related disorders with extensive clinical phenotyping, blood work and neuroimaging.

Clinical Outcomes: The research center started to liaise with academic centers in the Netherlands and also started to contact international military partners (e.g. Canada, US, UK, Germany and Australia). This e.g. led to the start of a longitudinal cohort study just before the deployment as part of ISAF to Afghanistan. In turn this cohort formed the start of a series of further projects in PTSD as well as resilience. At same time at the Veterans Institute several projects were started.

Patient Population: The population that is seen consists of active personnel to veterans that are willing to participate in biological and clinical studies. The largest group are participants in the PRISMO longitudinal cohort study, this is a 10-years follow up study. Also of worth is to mention the BFD cohort of over 100 injured servicemen. That were followed up after intensive treatment for battlefield injuries. The focus has bene on resilience enhancement as well as optimization of therapeutic treatment, such as those veterans that are considered treatment refractory.

Conclusion: After 15 years of deployment and battlefield related research in military personnel a wealth of new knowledge compacting in biomarkers of PTSD had been collected. This is visible in research output, but also in an infrastructure and in the range of liaisons with national and international partners. It demonstrates the response to a scientific need for knowledge but also is an effort in function of a moral challenge to collect best practices to prevent and treat service personnel with mental health care needs.

4B03: Leave No One Behind – Coordinated Veterans Mental Health Services in the Netherlands

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Brief Description: In 2008 the Dutch Secretary of Defense installed an organisation that was mandated to develop and coordinate a Mental Health Care Structure for post active Veterans. It was branded as national system of Care for veterans (named: Landelijk Zorgsysteem voor Veteranen, LZV). The task assignment of this cooperation was based on a newly implemented Dutch Veterans Act endorsed by national health care system. The LZV was intentionally constituted as a series of civilian-military cooperations, in accordance to its mission statement. Currently, LZV is a national cooperation of 12 civilian and military organisations, under regional coordination, that offer a variety of services to 2000 veterans annually, ranging from military chaplaincy to specialized social work and tertiary psychotrauma healthcare.

Clinical Outcomes: LZV continuously aims at further optimising the levels of care. There are three core value perspectives. First and foremost, the value for Dutch veterans: veterans can count on integrated professional treatment and support. Veterans are supported in leveraging their own strength and direction on the personal road to recovery. This also involves the family situation. Second, the value for society is also high; LZV aims at moral respect in society for the wide range of effects of deployment under exceptional circumstances, not in last place by offering high-quality care for veterans. Third, the value for LZV constituent partners is reflected in involvement and development of skilled professionals with specialized context specific expertise and a proven affinity for mental health issues in veterans. Quality of care is a fundamental value: development of optimal integrated care, based on the constant integration of research and Innovation is the main objective.

Patient Population: The population treated annually within the LZV system is totaling up to 2000 veterans. Spouses and other family members can be included, but are not part of this number.

Conclusion: Almost a decade after its installment the LZV has shown to be a proven and successful initiative. It has demonstrated to be able to guarantee highly specialized and context-specific mental health care for veterans embedded in a society with high accessibility of health care. Challenging questions of how research and innovation can be applied optimally in an era of budget restrictions are a stimulus to keep improving the structures in place.

4D01: Assessing Spiritual Fitness in Canadian Military Personnel and their Families

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Introduction: In military contexts, there is growing interest in an emerging concept of "spiritual fitness" - a sense of purpose, direction, and resources that facilitate the core self and feelings of connectedness with people and the world.1 The Canadian Army, in its recent Mission: Ready – The Canadian Army Integrated Performance Strategy (CAIPS) launched in November 2015,2 has identified spiritual fitness as one of six domains comprising operational readiness and performance fitness of military personnel (along with emotional, physical, social, familial and intellectual fitness). As part of the CAIPS, initiatives that enhance fitness in each domain are being explored, and evidence-based tools to measure performance and fitness are being sought. Currently, there is a dearth of spiritual fitness assessments that have been identified and validated specifically for a military population. A key step, therefore, is to identify evidence-based assessment(s) with validated psychometric properties for use by chaplains and health care professionals with military personnel and their families.

Methodology: A scoping review was undertaken to identify measures

of spiritual fitness that can be used in a military context. Two independent reviewers applied posthoc inclusion and exclusion criteria to assessments of spiritual fitness to identify relevant assessments. Key criteria included (1) psychometric properties, (2) the ability to (re)administer the assessment at several time-points (pre, during, post-deployment), and (3) be administered by military chaplains, healthcare professionals or military personnel (through self-report).

Results: Thirty-five assessments with psychometric properties were identified that could be administered by military chaplains, healthcare professionals, or military personnel (through self-report) to evaluate spiritual fitness over time among those in military service. The assessments were compared to highlight their differing properties, including target population, psychometric properties, length/time to complete, measurement of affective (emotional), behavioural (practices), and cognitive (thoughts) aspects of spiritual fitness, and example questions.

Conclusion: Evaluation of spiritual fitness within a military context is complex due to the subjective nature and diverse understandings of spiritual fitness. This research offers a clear description of the differences between spiritual fitness assessments. Chaplains, clinicians, and researchers may utilize this information to identify appropriate spiritual fitness assessments for the measurement and study of spiritual fitness within military personnel and their families. This review lays the foundation for further research in this area.

5A01: The Prevalence of Lifetime Mental Disorders with Pre-Recruitment Onset in Canadian Armed Forces Regular Force Personnel: A Military-Civilian Comparison

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Introduction: Recent military-civilian comparisons found a higher burden of mental disorders in Canadian Armed Forces Regular Force (RegF) personnel relative to Canadians in the general population (CGP) with similar socio-demographic composition and history of childhood trauma, suggesting that other factors may be at play, including a higher vulnerability to early onset mental disorders in the military. The purpose of this study was to compare the pre-recruitment mental health of RegF personnel and CGP with similar socio-demographic profiles by examining differences in the prevalence of lifetime mental disorders with a pre-recruitment onset.

Methodology: Data were obtained from two cross-sectional population-based surveys conducted by Statistics Canada in 2002: the Canadian Community Health Survey Cycle 1.2 Mental Health and Well-being (N=36,984) and its Canadian Forces supplement (N=5,154 RegF). Three mental disorders were assessed in both surveys using the World Mental Health - Composite International Diagnostic Interview Instrument: major depressive episode (MDE), panic disorder (PD), and social phobia (SP). The prevalence of mental disorders with pre-recruitment onset in the RegF was compared to estimates from a CGP subsample, in which a simulated recruitment date was assigned using multivariate imputation by chained equations. The CGP subsample (1) was limited to full-time employed individuals, aged 17 to 60 years, not recently emigrated, and without exclusionary characteristics for military service and (2) was weighted on a range of socio-demographic variables to agree with the corresponding variable distributions in the RegF. The weights were created using iterative proportional fitting procedure.

Results: Relative to matched CGP, RegF personnel had similar rates of lifetime PD and SP with pre-recruitment onset (1.3% vs 1.1% and 6.3% vs 6.2%, respectively). However, the prevalence of lifetime MDE with pre-recruitment onset was significantly higher in RegF personnel (4.2%) than in the matched CGP (2.8%). Individuals with lifetime MDE or PD with pre-recruitment onset were a minority in both RegF and CGP. In contrast, most SP cases had a pre-recruitment onset in both samples.

Conclusion: MDE was the only mental disorder with pre-recruitment onset that had a significantly higher prevalence in RegF than in matched CGP. The higher rate of MDE at the time of recruitment may partially explain the increased burden of past-year MDE in the military population relative to those in the CGP. These findings challenge the conventional notion that screening processes result in disproportionately favourable mental health at recruitment.

5A02: Mental Health of Canadian Military Personnel, Modern Veterans, and Civilians

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Introduction: Concern surrounding the mental health of the serving Canadian Forces personnel and modern Canadian Veterans (former members) has become more acute as a result of the Afghanistan-related military operations over the past 14 years. While mental health in each population has been extensively studied, previous comparisons between the two populations and with the general population have been limited to adjustment for age and sex. This study pooled recent survey data using very similar methods and identical measures in order to explore several mental health outcomes in the three populations by adjusting for additional potential confounders. We hypothesized, based on previous two-way comparisons, that modern Veterans would have worse mental health than serving military personnel, who in turn would have worse mental health than those in the general population.

Methodology: The data sources were the 2013 Canadian Forces Mental Health Survey (n = 6,700 Regular Force personnel), the 2013 Life After Service Survey (n = 2,600 Regular Force Veterans released from service between 1998 - 2012), and the 2012 Canadian Community Health Survey—Mental Health (n = 29,500 non-institutionalized Canadians in the general population). Indicators of mental health status included self-reported diagnosed chronic mental health conditions, self-rated mental health, and K10 psychological distress. Regression was used to adjust for group differences for age, sex, province of residence, language of preference, marital status, education, chronic physical conditions, income, and labour force participation.

Results: Only self-reported diagnosed mental health conditions fit the hypothesized pattern, with Veterans having a much higher adjusted prevalence than serving members, who had a higher prevalence than the general population. The other two outcomes showed different patterns: K10 psychological distress was greatest in the military, while it was similar in Veterans and the general population--notwithstanding the veterans' much higher burden of self-reported chronic mental health conditions. Self-rated mental health was also worse in the military, but it was only slightly worse in Veterans relative to the general population.

Conclusion: There are significant differences in the mental health of modern Canadian Veterans, military personnel, and the general population, even after extensive adjustment of highly comparable, high-quality survey data. However, different outcomes showed different patterns, with the Veterans showing the most divergent findings. Veterans had a much higher burden of chronic mental conditions but not higher levels of current distress. These findings highlight the need to use multiple complimentary measures to compare the mental health in different populations.

5A03: Associations between Income and Mental Disorders in the Canadian Forces

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Introduction: Research shows that mental health problems are common among military personnel who have been deployed to a combat zone. Research has also identified a clear link between low income and mental health disorders. An understanding of the potential multiplicative effect of being deployed and experiencing low income in military personnel is key to developing policies and programs that may help reduce the incidence of mental disorders in this population.

Methodology: This study will use the Canadian Community Health Survey 2013 and corresponding Canadian Forces Supplement (CCHS-CFS) to investigate the income-mental disorder relationship in active regular and reserve force personnel and compare these relationships to the general population. Cross-tabulations will be used to examine the prevalence of mental disorders in income quartiles. Multiple logistic regressions will be used to assess the strength of the relationship between income (both personal and household) and low income (as measured by the Low Income Measure, established by Statistics Canada) with mental disorders (major depressive disorder, social phobia disorder, panic disorder, and panic attacks, post-traumatic stress disorder, and generalized anxiety disorder). Resultant odds ratios will be adjusted for sociodemographics as well as several military factors, including branch, rank and deployment-related traumatic events.

Results: Research in other samples (including CCHS-CFS Cycle 1.2, U.S. military, and Canadian veteran samples) have shown that individuals in the lowest income bracket (regardless of scale) are at the greatest risk for mental disorders. Extrapolating from the existing research, it is hypothesized that a similar relationship will be found in the current Canadian Forces sample, with those having the lowest income being at greatest risk for mental disorders. Furthermore, it is expected that military factors such as low rank and previous deployment will influence the relationship and will be associated with higher prevalence of mental disorders.

Conclusion: This study has both practical and research implications. The results may indicate the need for more thorough screening procedures and prevention strategies in order to reduce the prevalence of mental health conditions in military personnel who are in lower income brackets. Early detection of those personnel who are at risk for mental health conditions as a result of poor financial circumstances may in turn have significant health and economic implications for the Canadian Forces. Further research investigating what factors may help in attenuating the potential negative outcomes associated with low income in the military may be warranted.

5D03: Electronic Mental Health Records in the Canadian Armed Forces: Epidemiological Surveillance and Population Health Indicators

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Introduction: Since the implementation of the Canadian Forces Health Information System Mental Health Notes (CFHIS-MH) electronic medical record in 2015, an abundance of psychiatric, psychosocial and addictions-related information is available from Canadian Armed Forces (CAF) mental health clinics nationwide. For audience edification and input, we present herein the background and preliminary results from the CFHIS-MH module, with a specific focus on the development of population mental health indicators.

Methodology: Canadian Forces Health Services Group leadership, mental health clinicians, clinical program managers, IT specialists and epidemiologists worked for three years to scope, design, and implement the CFHIS-MH module. Intake screening, referrals, session notes, diagnostic assessments, case conferences and discharge summary data are cleaned by an automated suite of algorithms, and deterministically linked to the Canadian Forces Health Evaluations and Reporting Outcomes (CF-HERO) surveillance system. Internal validation studies are conducted to confirm the accuracy of the extracts and ensure a high level of scientific reliability.

Prevalence and risk ratios were derived by integrating the CFHIS-MH extracts with human resource data from the CF-HERO system and employing time-series analytics to account for the longitudinal structure of the data. Predicted probabilities of elevated risk assessment scores were calculated using multivariate logistic regression.

Results: In the first quarter of 2016, 1,821 out of 65,681 (2.8%) Regular Force personnel were referred or self-presented for intake screening at a CAF mental health clinic. Intake screening was more likely among females than males (3.9% vs. 2.6%) and was more common in personnel 30-39 years (3.2%) than in 50-60 years of age (1.4%). At CAF bases and wings the Q1 2016 prevalence of MH intake screening ranged from 1.5% to 4.6%.

Of those that completed a MH intake screening, clinician-assessed risk levels were moderate or high for suicide (4.3%), violence (4.2%) and addictions (11.9%). Personal, family and occupational issues were the most common psychosocial stressors reported at intake screening. Notably, those who presented to MH intake screening with combined personal and addiction-related issues were significantly more likely to be assessed with an elevated risk of suicide.

Conclusion: The successful implementation of CFHIS-MH heralds new opportunities for MH surveillance in support of service men and women. The inclusion of standardized contextual information (including economic, social, occupational and family-related stressors) provides a more holistic perspective on the psychosocial and mental health status of CAF personnel. This presentation will conclude with audience discussion regarding high impact opportunities for mental health surveillance in CAF.

5E01: Mindfulness Based Cognitive Behavior Therapy Classes in Manitoba: Improving Access to Evidence Based Psychological Treatment

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Brief Description: There is strong evidence of the impact of cognitive behaviour therapy (CBT) and mindfulness-based stress reduction in reducing symptoms related to mood, anxiety and substance use disorders. Although individual and group-based delivery methods are the most common for delivering CBT, to improve access to larger populations, internet-based and large classroom based delivery methods of CBT have been shown to be effective, feasible, and increase accessibility.

Our team has developed a 4-session set of Mindfulness-Based Cognitive Behaviour Therapy (M-CBT) Classes to provide strategies for symptom reduction while individuals are waiting to receive traditional treatments for mood and anxiety disorders. The four 90 min classes are semi-structured and cover the following material. In each class, homework assignments are encouraged between sessions.

Session 1. Mindfulness, Basics of Cognitive Therapy, Thought records

Session 2. Mindfulness, Basics of Behaviour Therapy, Exposure therapy

Session 3. Mindfulness, Healthy Activity, Sleep hygiene.

Session 4. Mindfulness, Goal Setting, Assertiveness.

Most people attending the M-CBT classes reported significant improvement. Over 700 people have attended these classes (2014-2016) and we have received funding from the Manitoba Patient Access Network to implement these classes across different clinics, self-help organizations, and hospitals in Manitoba (2016).

Clinical Outcomes: Measures of satisfaction, reasons for dropping out of the classes are covered in each class. Patient Health Questionnaire 9-item, Generalized Anxiety Disorder -7 item, DSM-5 adult Cross cutting measure and World health organization Disability Assessment Scale is used to measure outcomes

Patient Population: Adult outpatients with mood and anxiety disorders are eligible. Military, veteran and civilians are included. The exclusion criterion for the classes include psychotic symptoms, serious suicidal ideation, or severe cognitive impairment. Each participant meets with a provider for 30 min to discuss whether the classes are suitable for the individual.

Conclusion: Mindfulness based Cognitive Behavior Therapy are a novel method of improving access, and providing timely care for people with mood and anxiety disorders.

5E02: Cognitive Rehabilitation for Military Service Members and Veterans with Post-traumatic Stress Disorder

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[1]University of British Columbia; [2]GF Strong Rehab Centre; [3]Home Base, a Red Sox Foundation and Massachusetts General Hospital program; [4]Harvard Medical School; [5]Spaulding Rehabilitation Hospital Network; [6]Center for Anxiety and Traumatic Stress Disorders

Brief Description: Concentration and memory problems are very common in patients with Post-Traumatic Stress Disorder (PTSD). Many veterans with combat-related PTSD have also sustained a traumatic brain injury (TBI) and/or have comorbid conditions (e.g., depression) that further impact their cognitive health. Cognitive difficulties can interfere with social role functioning and contribute to poor quality of life. The role for adjunctive treatment of cognition is increasingly recognized for various psychiatric disorders, but is insufficiently considered as part of PTSD care. There is a need for effective treatments that target cognition in PTSD. We have developed and are now implementing a cognitive strategy training intervention for PTSD, adapted from similar programs for military service-related TBI. It is delivered in a group format, concurrent with trauma-focused therapy, medical care, and mind-body wellness as part of an intensive outpatient model at Home Base, a Red Sox Foundation and Massachusetts General Hospital program, in Boston, USA. This presentation will outline the rationale, design process, and content of our novel cognitive health intervention, and discuss preliminary outcome data.

Clinical Outcomes: The primary outcome of interest is cognitive symptom self-management, measured by the cognitive subscale of the Self-Efficacy for Symptom Management Scale (Cicerone & Azulay, 2007). We are tracking a number of secondary outcomes, including cognitive symptom severity (cognitive subscale of the Neurobehavioral Symptom Inventory), PTSD symptom burden (PTSD Checklist-5), quality of life, and satisfaction. Initial findings suggest significant improvement on the primary outcome (Cohen's dwithin-subjects = 0.73) and high satisfaction (90.0% rated the intervention as "quite helpful" or "very helpful").

Patient Population: Participants in our program are post-9/11 active duty service members and veterans from all branches of the United States Armed Forces. The majority are males aged 25 to 45, with multiple post-deployment mental and physical health problems. The cognitive health intervention we will describe is suitable for service members and veterans with subjective cognitive difficulties associated with PTSD, TBI, and/or other comorbid conditions.

Conclusion: Cognitive strategy training fills an important need in the care of military service members and veterans with PTSD. Preliminary data suggest that this intervention is feasible and may be effective for reducing the impact of cognitive difficulties.

5E03: Attenuating PTSD Symptomology with Circadian Interventions to Facilitate Sleep in PTSD Patients with Compromised Sleep Hygiene

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Department of National Defence

Brief Description: Individuals suffering from posttraumatic stress disorder (PSTD) usually have compromised sleep hygiene which can exacerbate the severity of PTSD. We have recently optimized our ability to counter jetlag and shiftlag as well as address the extremes of seasonal photoperiod in the high Arctic by manipulation of circadian rhythms, forwards or backwards as appropriate to the situation. The circadian treatment modalities are: 1) appropriately timed ingestion of exogenous supplementary melatonin, 2) appropriately timed light treatment (which suppresses endogenous melatonin produced by the pineal gland) and 3) light avoidance at certain key times that would otherwise compromise the desired phase shift. The specific treatment timings are based on melatonin and light Phase Response Curves (PRCs). The treatment goal is to shift the daily melatonin onset timing, formally known as Dim Light Melatonin Onset (DLMO). We believe that a subset of the PTSD population will have a DLMO timing which is inappropriate for normal nocturnal sleep. We propose to measure DLMO in PTSD patients who have sleep hygiene issues and to confirm abnor-

mal DLMO timing and subsequently employ circadian interventions to shift DLMO to optimum times for facilitation of normal nocturnal sleep.

Clinical Outcomes: Our desired treatment outcome will be a normal evening DLMO timing between 2000 h and 2200 h.

Patient Population: Those with PTSD who also suffer from compromised sleep and have a DLMO timing which will preclude normal nocturnal sleep. During this presentation, we will also discuss recent research which indicates that within 48 hours of exposure to a traumatic episode, the endogenous production of melatonin is compromised and can lead to the development of PTSD. Thus, we believe the risk of developing PTSD could be mitigated by dosing with exogenous melatonin immediately after exposure to the traumatic event.

Conclusion: We are able to normalize abnormal DLMO timing with circadian interventions (melatonin and light treatments) and thus improve sleep hygiene in those suffering from PTSD, and we believe that this may attenuate the severity of PTSD. Further, melatonin supplementation within 48 hours of exposure to a traumatic event may be prophylactic against the development of PTSD.

Poster Presentations

P101: Adjunctive Therapy 2: Improving Cognitive Functioning in Military Members and Veterans with Trauma-related Disorders: Study Protocol and Pilot Findings

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Introduction: Post-traumatic stress disorder (PTSD) – including combat-related PTSD – is characterized by cognitive dysfunction across a host of domains including memory, executive functioning, and attention. Research suggests that the extent of this dysfunction may be greater among individuals with combat-related PTSD. Very little work has been done to investigate the efficacy of treatments aimed at reducing cognitive dysfunction among individuals with PTSD. Here, we present a protocol to examine the efficacy of a cognitive remediation therapy, Goal Management Training (GMT), in reducing cognitive dysfunction and improving functional outcomes among individuals with combat-related PTSD. GMT is a well-validated intervention aimed at improving goal directed behaviours and has been shown to reduce cognitive dysfunction in several populations (e.g., traumatic brain injury, dementia). Indeed, previous work from our lab has shown a trend towards improved performance on objective measures of executive functioning and impulsivity accompanied by decreased dissociative symptoms ($ps < .10$) among a heterogeneous psychiatric sample following GMT. We also present pilot work from our lab demonstrating the efficacy of GMT in reducing subjective cognitive impairment and improving functional outcomes among individuals with affective disorders.

Methodology: We will recruit 60 individuals with combat-related PTSD and reported alterations in cognitive functioning from the inpatient PTSD treatment unit at Homewood Health Center. Participants will be randomly assigned to receive GMT or a matched psychosocial education group. Participants will complete a series of neuropsychological, clinical, and functional assessments at baseline, post-treatment, and 3-month follow-up. A pilot/feasibility study was conducted with 5 individuals with major depressive disorder and/or PTSD who completed a 9-week GMT intervention. Self-report data on cognitive functioning and functional outcomes was collected pre- and post-treatment, including the cognitive failures questionnaire (CFQ) and the Sheehan Disability Scale (SDS). Data were analyzed using paired sample t-tests or Wilcoxin signed rank test (depending on normality).

Results: Following treatment, we observed a significant improvement on the CFQ, $t(4)=3.73$, $p=.002$, and a trend-level reduction in self-reported impairments in social, ($Z=-1.84$, $p=.066$) and family functioning ($Z=-1.84$, $p=.066$).

Conclusion: Cognitive difficulties among individuals with affective disorders are associated with poor functional outcomes (e.g., work or social functioning) and reduced treatment response. Augmentative treatments such as GMT have the ability to assist military members with PTSD in improving functional outcomes (e.g., return to work; retraining) and have the potential to improve treatment outcomes. Indeed, our pilot work demonstrates that GMT is successful in reducing cognitive dysfunction and improving family and social functioning among individuals with affective disorders.

P103: Improving Relationships Affected by PTSD: Veteran Couples Therapy Based on a Three Phase PTSD-Tailored EAL Program

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Introduction: The emerging Can Praxis program now offers three phases of equine-assisted learning (EAL) therapy to address relationship issues for veteran couples affected by Posttraumatic Stress Disorder (PTSD). The program starts with ground-based activities in Phase I and progresses to riding activities in Phases II and III to enhance the horse/human interaction.

Methodology: This therapy, delivered via experiential learning, utilizes a program of goal-directed EAL activities integrated with practical self-mediation techniques. Pilot testing for Phase I started in March 2013 and as of February 2016, 127 veteran couples along with five Royal Canadian Mounted Police (RCMP) couples have completed the initial therapy session.

Results: Phase I examines 'relief from PTSD symptoms' and 'acquisition of self-mediation skills and knowledge' as a first data collection point. Current findings for the end of Phase I, suggested that 96.97% of veterans and 87.90% of spouses/partners were very positive that the integrated PTSD-tailored EAL program would help them repair their personal relationship(s). The second data collection point includes three follow-up scenarios: i) once Phase I participants are back in their everyday environment for a minimum of three months; ii) completion of Phase II of the program; and/or iii) completion of Phase III. These follow-up scenarios provide for an examination of 'improvement in personal relationships' and 'longer-term reduction in PTSD symptoms'. The current follow-up data from 32 veterans and 25 spouses/partners indicate that 92.98% reported improvement in their personal relationship(s) after an average of 11.12 months post therapy.

Conclusion: Most of these 57 follow-up participants attributed this success to both learning the communication and conflict resolution

skills emphasized in the self-mediation process and the influence of positive interactions with horses. These positive early results are moving the Can Praxis program towards its goal of meeting the scientific criteria for a valid evidence-based therapy, which could be included in the long-term mental health strategies of Veteran's Affairs Canada and other paramilitary organizations like the RCMP.

P104: Treatment Ambivalence in a Sample of Treatment-seeking Canadian Armed Forces Members and Veterans

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Introduction: Clinical experience suggests that military personnel and veterans may express ambivalence about therapy even after initiating psychological treatment. This study assessed treatment concerns in a sample of Canadian Armed Forces (CAF) members and veterans using a questionnaire originally validated in a large (N = 366) sample of treatment-seeking civilians at a specialized outpatient anxiety disorders clinic.

Methodology: Actively-serving CAF members and veterans newly referred to the Parkwood Institute Operational Stress Injury (OSI) Clinic (N=35) completed measures including the Treatment Ambivalence Questionnaire (TAQ), the Depression and Anxiety Stress Scales (DASS-21), and the PTSD Checklist, Military Version (PCL-M). The TAQ is a 26-item self-report measure of treatment initiation concerns. Scores comprise 2 subscales: fears of personal consequences (TAQ-PC), fears of adverse reactions (TAQ-AR), and concerns about inconvenience (TAQ-I). The TAQ also includes a write-in section soliciting information about other treatment-related concerns. Correlations between the TAQ, DASS-21, and PCL-M were examined, as were themes in write-in responses. Mean TAQ subscale scores were then compared to those obtained from a civilian sample of anxiety patients.

Results: Of the 35 participants, 30 had a Posttraumatic Stress Disorder (PTSD) diagnosis. Those with PTSD scored significantly higher on TAQ-PC than those without, $t(16)$ = 3.01, p = .009. Total and subscale TAQ scores were not significantly correlated with the PCL-M (p range = .095 - .93). TAQ-PC was significantly correlated with DASS-21 anxiety (r = .398, p = .049), while the TAQ-AR was significantly correlated with all three DASS-21 subscales: depression (r = .642, p = .002); anxiety (r = .585, p = .007), and stress (r = .715, p = .001). Overall scores on the TAQ were similar to those in the anxiety disorders sample, $t(398)$ = .94, p = .35 (full sample); $t(328)$ = 1.61, p = .11 (PTSD sample). TAQ-PC scores were significantly higher in the CAF sample, as compared to the anxiety sample, $t(328)$ = 2.6, p

Conclusion: Our findings suggest that CAF members and veterans are particularly concerned about certain personal consequences of treatment (e.g., unwanted personality or relationship changes), as compared to civilians presenting for anxiety treatment, and that these concerns are more prominent in those diagnosed with PTSD. Implications for treatment are discussed.

P105: Combating CAF Soldier Suicides: The Use of Social Media (SM) and Social Network Sites (SNS) as a Tool in Preventing Suicidality among Canadian Soldiers

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Introduction: Durkheim (1897) posits that suicide is a socially influenced phenomenon and that suicide rates rise and fall in concert with the degree to which social forces isolate or connect individuals. In particular, Durkheim outlined two suicide categories of interest to the Canadian Armed Forces (CAF): egoistic, whereby individuals commit suicide due to feelings of social disconnectedness; and fatalistic, in which individuals feel stifled by too much regulation. More recently, studies have found that individual factors such as mental health disorders, are also important contributors to suicidality (Joiner et al, 2012). Within the context of the CAF military culture in which emphasis is placed on cohesion to the detriment of the individual, mental health disorders are stigmatized and those who seek help are largely ostracized from the group. In order to improve the perception of connectedness, social capital, specifically bonding social capital (Putnam, 2002), can be leveraged to provide needed emotional support and prevent suicidality. Indeed, the mobilization of various resources through the integration of social media and social network sites into pre-existing mental health initiatives could potentially be a cost effective method of suicide prevention among CAF soldiers.

Methodology: Theory synthesis or metatheory (Turner, 1991) provides a framework through which to identify and analyse points of convergence between suicide theories, social capital theories and social media theories in light of military culture. This project applies this method by synthesizing the work of Joiner et al and Durkheim with Putnam's social capital along with social media theories (McQuail, 1983) in to single metatheory that can further shape research into this important issue.

Results: The implications of theoretical convergences drawn from theory synthesis follows and suggestions for practical application of resulting insights are made with respect to current suicide prevention initiatives. The synthesis resulted in the development of social, individual, and institutional risk factors that each drew from the sources theory of Durkheim, Putnam, and McQuail (amongst others). This project fully examines each of these factors and provides a novel framework for which to further inform policy towards our veterans and service members.

Conclusion: Analysis based on theoretical connections identified through the use of theory synthesis suggests that suicide prevention strategies are reinforced by mobilizing social capital resources in the use of social media/social network sites.

P106: Psychometric properties of the 10-item Connor-Davidson Resilience Scale in Canadian Veterans with Operational Stress Injuries

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Introduction: Resilience refers to personal qualities that enable individuals to withstand the effects of exposure to stress or trauma. As such, assessing resilience is a key component of trauma-related research and clinical practice. The 10-item Connor-Davidson Resilience Scale (CD-RISC) is a well-used instrument for measuring resilience that has been validated in many study populations and in many languages. This presentation will examine preliminary data supporting the psychometric properties of the 10-item CD-RISC in a sample of Canadian Armed Forces (CAF) veterans diagnosed with an Operational Stress Injury (OSI).

Methodology: All clients referred to the Royal Ottawa OSI Clinic complete a series of questionnaires at intake, including the CD-RISC, PTSD Checklist - Military Version (PCL-M), Beck Depression Inventory (BDI-II), and Outcome Questionnaire-45 (OQ-45). To date, over 500 clients have completed these measures. The CD-RISC has also been administered to a small subset of clients before and after group therapy.

Results: Descriptive statistics suggest that clients were able to understand and complete the CD-RISC. Missing data were minimal and no floor or ceiling effects were observed. The CD-RISC demonstrated good internal consistency, with Cronbach's alpha coefficient > 0.90. Resilience scores were able to distinguish between clients with diagnoses of posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) and those without, and were significantly negatively correlated with scores on the PCL-M, BDI-II and OQ-45, suggesting that the CD-RISC is also a valid measure of resilience. Further work on factor analysis and sensitivity to change is in progress.

Conclusion: Preliminary data suggest that the 10-item CD-RISC is a reliable and valid measure of resilience in Canadian veterans with OSIs. Data will be collected to examine test-retest reliability and more longitudinal data will be collected to examine the CD-RISC's ability to detect change.

P107: Mental Health and Socioeconomic/Rank Gradient in CAF Veterans – Life After Service Study 2013

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Introduction: An association between the mental health of Canadian Armed Forces (CAF) Veterans and rank at release has been observed, but little information is available describing the underlying cause of this association. There is a well-established relationship between socioeconomic status (SES) and health, termed the socioeconomic status gradient in health. The objective of this study was to determine whether a SES gradient in mental health exists in the CAF Veteran population and whether this gradient could be associated with observed differences in mental health between rank groups.

Methodology: Subjects were a stratified random sample of 2329 Regular Force CAF Veterans who were released in 1998-2012, and had participated in the 2013 Life After Service Survey. Four socioeconomic measures were used to assess SES: labour force participation, highest education attained, income adequacy, and marital status. Two measures of mental health were used: self-reported presence of a diagnosed mental health condition (MHC), and self-rated mental health. Descriptive statistical analysis and multivariable logistical regression modelling were used to explore the association between rank, mental health, and SES.

Results: The odds of having a MHC or self-rated fair or poor mental health were higher in non-commissioned members (NCM) than officers, (odds ratio 2.5 95%CI:1.9-3.1 and 2.3, CI:1.5-2.8 respectively). A SES gradient was observed in the ranks, with a higher proportion of officers in the higher socioeconomic categories. The unadjusted odds of having a MHC in NCMs relative to officers was 2.5, after adjustment for rank, age, sex and socioeconomic measures the odds ratio was 1.8.

Conclusion: This study found that a SES gradient in mental health exists within the ranks of CAF Veterans, and SES is associated with the observed differences in mental health between ranks. The implications of these findings are twofold. Primarily, Veterans who are of lower SES

should be the target of mental health programming and supportive resources. Further research is required to identify factors influencing the observed difference in adverse mental health prevalence between rank groups.

P108: Yoga for Treatment of Chronic Pain in RCMP, Military Personnel and Veterans

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Brief Description: Chronic pain is a serious health issue in Canada, and an even greater issue in military and police populations. Chronic pain is known to cause substantial suffering, reduced quality of life, and decreased functional capacity. Symptoms of post-traumatic stress and depression are also highly prevalent in military personnel and Veterans with chronic pain. Yoga as treatment for a number of chronic pain conditions has been demonstrated to be effective for civilians in randomized controlled trials. However, it is unknown if results from previously published trials generalize to military populations. The following study is an investigation of the potential efficacy of yoga for chronic pain in RCMP, military personnel, and veterans.

Clinical Outcomes: This study used an eight week intervention period during which participants were asked to attend weekly group yoga class with home practice. Poses were selected for being trauma-sensitive and were modified for specific pain conditions of the participants. Each class also included a meditation component. Self-report measures of pain intensity and pain-related concerns (such as kinesiophobia and pain coping strategies) were administered pre- and post-treatment, as were measures of depression and PTSD symptoms. Qualitative interviews with participants in the yoga group were conducted to explore the impact of chronic pain and yoga on facets not identified in the self-report measures.

Patient Population: Participants were recruited through the Deer Lodge Centre Operational Stress Injury Clinic (OSIC) and included individuals from military, veteran, and RCMP populations. Inclusion criteria included a chronic pain condition of six months duration or longer and completion of an introductory pain management course. Confidentiality, anonymity, and ethical concerns were addressed and approval to conduct the study was granted by the University of Manitoba Health Research Ethics Board (HREB).

Conclusion: Although our data collection phase is not yet complete, we expect that this study will help determine if yoga can become an effective treatment for RCMP, Military personnel and Veterans with chronic pain conditions and psychological comorbidities.

P109: Combat Veterans with Posttraumatic Stress Disorder Exhibit Altered Neuroendocrine Hormonal Profiles

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Introduction: Posttraumatic stress disorder (PTSD) is a psychiatric condition, characterized by an array of cognitive, affective, and attentional disturbances, that develops in some but not all persons after exposure to traumatic events. Evidence suggests PTSD is associated with abnor-

malities in a number of biological systems, including the central and peripheral sympathetic nervous system (SNS) and hypothalamic-pituitary-adrenocortical (HPA) axis. However, neuroendocrine mechanisms underlying these symptoms are not fully understood and few studies have investigated dysregulation of these systems in combat veterans diagnosed with PTSD using the Clinician Administered PTSD Scale (CAPS). We examined SNS and HPA function in 10 veterans with PTSD, 10 trauma-exposed without PTSD, and 10 non-traumatized controls.

Methodology: Participants were 18–60 yrs., male treatment-seeking veterans of any era with a diagnosis of current PTSD related to warzone experiences and fulfilling DSM-IV criteria for PTSD (CAPS ≥50). Trauma-exposed (TE) controls experienced at least one potentially traumatic event and had CAPS ≤15. TE and non-traumatized (NT) controls had no history of PTSD or DSM-IV Axis-I psychopathology. PTSD patients were excluded if they met diagnostic criteria for major depressive disorder, psychotic disorder, personality disorder, or suicidal risk. The study was approved by the Human Research Ethics Boards of Western University and DRDC and informed consent was obtained. Measurement of HPA hormones [Cortisol (CORT), dehydroepiandrosterone-sulphate (DHEA-S), Testosterone (TEST)] was performed on an IMMULITE® analyzer using chemiluminescent enzyme immunoassays. Plasma catecholamines (E, NE) were measured by Bi-CAT® immunoassay. Statistical significance ($p<0.05$) evaluated by unpaired t-test.

Results: Relative to both TE and NT controls, veterans with PTSD exhibited significant alterations in basal levels of all SNS and HPA hormones apart from TEST. E and NE concentrations (nmol/l) were elevated in PTSD (E 1.0 ±0.4; NE 3.1±0.5) compared to TE (E 0.25 ±0.1; NE 1.5±0.4) and NT control groups (E 0.2 ±0.1; NE 1.3±0.4). By contrast, CORT (nmol/l) was lower in PTSD (322.6±55.9), compared to TE (401.3±84.2) and NT (463.8±102.8). DHEA-S (mmol/l) was highest in TE (12.3±2.0), followed by PTSD (7.8±3.7), and lowest in NT (3.6±1.1). TEST levels exhibited a trend toward higher values (20.6±3.1) in PTSD but did not reach significance.

Conclusion: Our results demonstrate combat-related PTSD is associated with high circulating levels of E and NE, moderately elevated DHEA-S, but low cortisol, as compared to TE and NT. These findings are in line with data suggesting blunted HPA axis responsiveness with concurrent overreactivity of the SNS in PTSD; such aberrant responsiveness of these neuroendocrine systems may be pathologically significant, contributing to chronic symptoms of hyperarousal and distress, dysfunctional immune reactivity, chronic inflammation and other psychobiologically-mediated somatic abnormalities in veterans with PTSD.

P110: Vivre avec un syndrome de stress post-traumatique : l'expérience et l'impact du diagnostic pour des militaires français

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Université Laval

Introduction: Le syndrome de stress post-traumatique (SSPT) est au centre des recherches, depuis plusieurs années, lorsqu'il est question de la santé des militaires et des vétérans. Les domaines de la médecine et de la psychologie ont contribué à l'amélioration de la prévention et du traitement de ce trouble. Se faire diagnostiquer comme étant atteint de SSPT a des effets majeurs pour le militaire concerné tant positifs que négatifs. Se pencher sur la façon dont le diagnostic est vécu et sur son impact a donc une grande importance afin d'accompagner ces

soldats traumatisés dans les épreuves suivant leur traumatisme et leur évaluation médicale. L'aspect anthropologique de ma recherche met de l'avant l'après diagnostic en discutant de l'expérience et de l'impact du diagnostic du SSPT.

Methodology: En travaillant à partir des concepts de sous-culture militaire, d'anthropologie du corps, de la mémoire et du discours, le travail de terrain m'a permis de rencontrer 12 militaires et vétérans français, dont cinq atteints de SSPT, afin de découvrir leur expérience face à ce trouble.

Results: Les entretiens réalisés ont montré les étapes à franchir pour se faire diagnostiquer et obtenir l'aide mise à leur disposition ainsi que l'impact d'un tel diagnostic sur la perception identitaire du militaire, sur sa conception du monde et sur son entourage. Cette recherche a également montré que la mise en diagnostic actuelle, notamment en France, repose sur plusieurs paradoxes qui peuvent entrainer des contradictions entre la façon dont le trouble est considéré et le milieu dans lequel évolue la personne atteinte. La non-différenciation des traumatismes à l'origine du SSPT, les principaux modes de traitements offerts, la notion de victimisation qui ressort du diagnostic, etc., sont toutes des caractéristiques propres au diagnostic établi actuellement mettant de l'avant une trop grande généralisation de la mise en diagnostic du SSPT. Cela peut avoir pour conséquence une inadéquation entre le diagnostic et l'univers de sens des soldats, leurs normes et valeurs, leurs caractéristiques et tabous, qui peuvent entraîner des conséquences non négligeables pour le militaire (refus du diagnostic, incompréhension des termes, refus des traitements, etc.).

Conclusion: Dans cette communication, je démontre que le fait de travailler auprès d'une sous-culture particulière, celle des militaires français, a concrétisé l'impact de ce diagnostic tout en démontrant l'inadéquation entre la construction diagnostique et la population touchée par le trouble. Se pencher, aujourd'hui, sur ces paradoxes pourrait permettre aux militaires, dans leur spécificité, d'obtenir un diagnostic et une prise en charge plus efficaces.

P112: Suicidal Thoughts in Patients on a Waiting List for Treatment at Entry into a Randomized Controlled Trial of a Coach-Facilitated e-Therapy Program

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Introduction: Depression is common and disabling, and in Canada there are long waitlists to see mental health professionals. One of the concerns about these waiting lists is that people with severe symptoms including suicidal thoughts and behaviours are untreated and could potentially die before they are seen. We conducted a randomized controlled trial (RCT) of a coach-facilitated online cognitive behavior therapy program compared to information about online therapies in people on a waiting list for a Mood and Anxiety Program at a tertiary mental health care hospital. As part of this trial, we collected information about suicidal thoughts and behaviour at baseline. The objective was to describe these suicidal thoughts and behaviours and to evaluate the relationship between suicidality and characteristics of the patients enrolled in the study.

Methodology: We conducted a 12-week RCT at the Royal Ottawa Mental Health Centre with patients on the waitlist for the: Mood and Anxiety Outpatient Clinic, Geriatric Psychiatry and Youth Psychiatry programs. At baseline, severity of depression was assessed with the

Patient Health Questionnaire depression scale (PHQ-9) and suicidal thoughts were evaluated using Question 9 of the PHQ-9. If participants reported having suicidal thoughts, this was further assessed with the Columbia Suicide Severity Rating Scale. Other measures at baseline include: collection of demographics and completion of the Medical Outcomes Survey Short Form 12 (SF-12) and the EuroQol Five Dimensions (EQ-5D).

Results: We will describe the nature of the suicidal thoughts and how suicidal participants differ from non-suicidal participants. The results show that 50.5% of participants who present to their baseline intake appointment with thoughts of death or self-harm. Of this 50.5%: 93.8% are currently taking psychiatric medication; 64.6% are female; and 12.5% identify as non-Caucasian. 6.3% of participants had suicidal thoughts at baseline but did not have high scores on the PHQ-9.

Conclusion: Six of ten people in this sample did not have suicidal thoughts, which may inform triage decisions at intake. We will discuss the role of the PHQ-9 as a screening instrument.

Novel Health Technologies

Podium Presentations

1C02: Adjunctive Treatments for PTSD: EEG and Real Time fMRI Neurofeedback Recruits Emotion Regulation Regions in PTSD

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Introduction: Electroencephalogram (EEG) neurofeedback, aimed at reducing the amplitude of the brain alpha-rhythms, has been shown to alter neural networks associated with posttraumatic stress disorder (PTSD), leading to acute symptom alleviation among patients. Critically, the amygdala is thought to be one of the central brain regions mediating PTSD symptoms. We therefore a) compared patterns of amygdala complex connectivity using fMRI, before and after alpha-reducing EEG neurofeedback; and b) targeted amygdala down-regulation using real time fMRI neurofeedback in PTSD.

Methodology: Experiment A: Amygdala complex connectivity was measured in PTSD patients (n=21), before and after a 30-minute session of EEG neurofeedback targeting alpha desynchronization.

Experiment B: PTSD patients (n=10) completed 3 sessions of real time fMRI. Generalized psychophysiological interaction and dynamic causal modelling (DCM) analyses were also computed to explore connectivity and causal structure, respectively.

Results: Experiment A: EEG neurofeedback was associated with a shift in amygdala complex connectivity from areas implicated in defensive responses (periaqueductal grey) to prefrontal areas implicated in emotion regulation. This shift in amygdala complex connectivity was associated with reduced arousal, greater resting alpha synchronization, and was negatively correlated to PTSD symptoms severity.

Experiment B: PTSD patients were able to down-regulate amygdala activation. Increased activation in the dorsolateral prefrontal cortex and increased prefrontal-amygdala connectivity was found during regulate as compared to view conditions. DCM analyses favoured a neural model characterized by both top-down and bottom-up modulation of amygdala-PFC connectivity.

Conclusion: Results show recruitment of prefrontal regions involved in emotion regulation in addition to acute symptom alleviation for EEG and real time fMRI neurofeedback.

2E03: Mobile Applications for Personalized Road to Mental Readiness (R2MR) Training

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Department of National Defence

Introduction: The Canadian Armed Forces (CAF) are expanding and modernizing the training and preparation provided to CAF members for mental health and resilience. The core of this effort is an evidence-based mental health and resilience training program called the Road to Mental Readiness (R2MR). R2MR encompasses resilience and mental health training that is embedded throughout CAF members' career, including the deployment cycle. Previous program evaluation has indicated significant increases in knowledge, skill acquisition and confidence, care-seeking behaviour, as well as moderate effect sizes in stigma reduction. However, it has also been shown that repetitive application and practice of the skills in the training environment is essential for retention and effectiveness. As such, we are developing and evaluating a series of mobile applications ("apps") designed to make this training available to CAF members when and how they need it.

Methodology: The R2MR apps can be used as an adjunct to mental health treatment as they are based on cognitive behavioural theory (CBT). Specifically, mobile apps for goal-setting, self-talk, mental rehearsal, tactical breathing, attention control and working memory will allow users to build CBT-based personal training scenarios to help them achieve mental health objectives. A mental health continuum app will allow individuals to self-monitor and will suggest when additional resources may be required. Integrated into existing mobile technology, these apps will enable users to set reminders and monitor their progress over time in a number of different mental health areas. Following iterative usability testing, we are evaluating the advanced features of mobile devices such as: remote access to care using telephone and maps (GPS), gamification and immersion in a serious game, as well as the use of real-time biofeedback via wearable technologies (e.g., heart rate monitors) used with mobile devices.

Results: Preliminary results indicate a ceiling effect in performance during tactical breathing with and without real-time biofeedback in experienced individuals. Additional testing is required with novice individuals. Further, we are evaluating of the instructional value of complementing the existing R2MR curriculum with mobile apps in efforts to promote repeated application and practice of the R2MR skills for improved retention and effectiveness.

Conclusion: Comprehensive validation and evaluation during all stages of mobile app development is crucial for effective mobile training apps. Evidence from the current and upcoming studies will provide evidence for the potential benefits of incorporating training apps as a complement to an ongoing classroom curriculum.

3E03: Strongest Families: Bridging the Geographical Divide

*Lingley-Pottie, P., PhD

Strongest Families Institute; Dalhousie University; IWK Health Centre

Brief Description: Service members and their children are faced with many challenges that are unique to military life. Military children and youth are vulnerable to develop behaviour or anxiety problems due to the nature of the member's position that can lead to frequent changes and separations that can be disruptive to family life. Strongest Families Institute (SFI) delivers evidence-based, distance services to military and Veteran families. Harnessing the advantages of technology, families receive help in the comfort and privacy of their home at convenient times (i.e., days, evenings, nights). Our distance methodology can connect family members regardless of geographical location. Barriers to care are virtually eliminated (e.g., no travel, no missed time from work/school, stigma). With a centralized coaching availability, families connect with their coach regardless of where they live or how they are separated.

The Strongest Families proven programs for child and youth behavior and anxiety issues are based on best science. The skill-based curricula is customized to meet the families' needs with a specific focus on assisting them to deal with the common challenges of military life (e.g., transitions related to frequent postings or deployment, reintegration into the home).

Program components include: written materials (handbooks or smart-website technology), skill demonstration media (videos and audios) and structured weekly coach telephone calls. Coaching calls are flexible to accommodate service members, regardless of where they reside. The family-centred approach helps families plan for transitions, learn skills to cope with separation and strengthens family relationships.

Strongest Families has worked with funders (i.e., Military Family Services-Ottawa; True Patriot Love Bell Let's Talk fund) to extend services to Canadian military families. Results from approximately thirty families who completed a Strongest Families program will be presented. Additionally, the presentation will include case examples and a demonstration of the youth online smart interface.

Clinical Outcomes: The primary outcome measure is the Brief Child and Family Phone Interview, which evaluates impact on pediatric internalizing and externalizing issues, child and family impairment and parent mood as well as customer satisfaction.

Patient Population: Military or Veteran families with children who presented with significant behavioural or anxiety issues.

Conclusion: Increasing access to evidence-based, online services to military children, youth and families can bridge the geographical divide, having a positive impact on their mental health and well-being. Providing timely services to military families where and when needed will help to develop life-long coping skills and strengthen family relationships during times of transition and/or separation.

4D02: The Science & Art of Communication: Lessons Learned & Outcomes

*Rosen, H., MBA

LifeWIRE Corp; Carnegie Mellon University

Brief Description: LifeWIRE is a patented, automated, cloud-based interactive communication platform that allows clinicians, social workers, and their community of care to interact with Veterans, who otherwise find direct contact with social services and family members too challenging, through personalized two-way messaging that allows the person in need to determine the pace and substance of interaction. Through ANY mobile device or tablet and without the need to install software, the platform is being used to support veterans who suffer from Post-Traumatic Stress, High-Risk Suicide, Substance Use as well as a Maternal Care encompassing all the aforementioned.

The LifeWIRE presentation for the CIMVHR provides an overview on the Lessons Learned gained from over 3,500 insights working with Veteran populations for over 10 years of what has worked, what hasn't, results from various pilots and on-going utilization with Veterans and active duty personnel. Understanding the science as well as the art of communication is essential to effective results. Without a keen understanding of both, the clinical interventions will most likely end up falling on deaf ears leaving the Vet feeling frustrated falling further into depression. For the most valuable and positive results and outcomes, "we" should be communicating with Veterans in a manner that gives them personal choice in how, when and where they are reached, with whom they maintain a connection and provide simple means of outreach when in need.

Often it is a simple message of hope or encouragement sent by the caregiver that can bring a Vet back to center.

Clinical Outcomes: Proof of effectiveness ultimately lies in the results. Our connected approach has driven exciting outcomes, including:

1) An average contact rate of over 75% of those contacted

2) Staff time managing their clients reduced by as much as 80%

3) Substance Use relapse reduced 57% from 30% to 13%

4) PTSD Re-admissions reduced by approximately 32%

Patient Population: Veterans ranging in age from Vietnam era to current day predominantly male except the Maternal Care Program who are female between the ages of 18 - 35

Conclusion: We must seamlessly bridge the gap between Vets and their support team enabling the Vet to feel they have a say in how they are treated, what they communicate and to whom they reach out and by automating their workflows, allow clinicians to work at the top of their license. It's about empowerment. It's about allowing Vets to be involved yet relieving the stress of direct confrontation with the treatment team that often results in compounding the anger and anxiety.

5D04: Health is Not a Barcode: On Analytics, Informatics and Epidemiology in the Canadian Armed Forces

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Introduction: The nationwide implementation of the Canadian Forces Health Information System (CFHIS) in 2012 was a significant milestone in the digital march towards robust electronic health records (EHR), clinical decision support, personalized medicine and population health metrics. Real-time synchronization and availability of Canadian Armed Forces (CAF) personnel health records is now available in-gar-

rison, on deployment and at sea and forms one of the largest EHRs in Canada.

Methodological and statistical advances, however, have struggled to keep pace with the considerable technical achievements. Organizations that transition to information-rich environments must consider the oft-overlooked complexities of EHR and other routinely collected data sources, and manage expectations of health analytics influenced by smart phone and tablet applications.

Methodology: This presentation will review the epidemiological and informational challenges associated with the implementation of EHRs and modern health informatics systems, with a focus on the fundamental differences between validated population health indicators and information provided by commercial or retail data analytics.

Such differences include: a) adequate enumeration of the population at risk; b) uncertainty in the outcome of interest; c) variation in the severity and duration of injury or disease; d) attention to causation versus correlation; e) co-morbid interactions, and f) emergent properties under complexity theory.

Results: Epidemiology and data science address such challenges with a balance of classical and contemporary biostatistical tools. Established epidemiological measures such as sensitivity, specificity, and positive and negative predictive values are central to developing useful health information and distinguishing evidence-based science from consumer analytics.

Event-Measure-State (EMS) analyses and washout/observation periods are necessary to discriminate incident versus prevalent cases of disease and authenticate population health indicators.

Conclusion: The ubiquity, depth and intrusiveness of modern data systems generate vastly different risk and benefit profiles for individuals, organizations, and societies. Studies on the disparate impact of non-validated data mining techniques have revealed some recurrent, unintended and subtle computational artifacts related to the use of automated decision tools.

The potential hazards of using non-validated commercial off-the-shelf software to determine the burden of illness in the CAF population and direct health policy and programs will be discussed, along with the implications for resource distribution in CAF health services.

6D01: Compartment Release in Austere Locations (CORAL): A Pilot Study of Telesurgery

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Introduction: Telesurgery for compartment release has the potential to improve limb salvage in austere environments. This pilot study was performed to establish the feasibility of this procedure and identify methodological issues relevant for future research.

Methodology: Three anesthesiologists and one critical care physician were recruited as operators. The participants were directed to perform a two-incision fasciotomy on a Thiel-embalmed cadaver leg under the guidance of a remotely located military orthopaedic surgeon.

The operating physician and the surgeon (mentor) were connected through Reacts Lite© software running on iPad Air2©, which allowed for real-time supervision and the use of a virtual reality pointer overlaid onto the surgical field. A critical care nurse without surgical experience performed as first assistant. Two experienced orthopaedic traumatologists independently assessed the adequacy of compartment decompression and the presence of iatrogenic complications. A questionnaire was administered to the physicians before and after the procedure to assess their level of confidence in performing this procedure.

Results: The average surgery lasted 56 mins 12 s (SD 244 s). Both evaluators reported that 14 of 16 total compartments were completely released. The first evaluator considered that two deep posterior compartments were incompletely released at the soleus arch. The second evaluator considered that two superficial posterior compartments were incompletely released over the proximal gastrocnemius. There were no iatrogenic neurovascular injuries. The only complication was a large laceration to the soleus that occurred during a period of blurred video signal attributed to a drop in bandwidth. The tele-mentor reported the greatest challenges were visualization of the superficial peroneal nerve and release of the deep posterior compartment. The latter requires balancing full release at the soleus arch with the risk of injury to the popliteal vessels. Three of the four participants stated afterwards that they would feel confident or very confident to perform this procedure under the video guidance of a surgeon. We also observed a significant learning curve for the tele-mentor.

Conclusion: Our results are promising and warrant further research. Both evaluators reported that all compartments were released with 87% of all compartments fully released. There were no iatrogenic neurovascular injuries. We noted inter-observer variation in the assessment of compartment release, which should be considered in the design of future research protocols. The deep posterior compartment is the hardest to adequately release during tele-surgery. A headlamp would help visualization of deeper structures.

6D02: Fresh Whole Blood Donors during OP ATHENA: A Retrospective Database Review

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McGill University; Department of National Defence

Introduction: Fresh whole blood (FWB) provides all required clotting factors and red blood cells required to resuscitate the bleeding combat casualy. Provision of FWB for damage control resuscitation (DCR) in deployed setting is becoming increasingly important due increasing evidence of benefit and adoption of new North Atlantic Treaty Organization (NATO) doctrine. From 2006-2009 Canadian Forces Health Services Group and Canadian Blood Services (CBS) ran a FWB walking blood bank program at Kandahar Airfield in Afghanistan. We wanted to review the CBS donor screening and testing data to review the number of donation deferrals, type of deferrals and percent error on identity discs (ID discs) for ABO groups and Rh factors.

Methodology: We queried the CBS and CF H Svcs Gp FWB program database from 2006 – 2009, after approval by chain of command. All data was de-identified and placed into a protected database. Demographic data such as age, sex and previous donations were collected. ABO and Rh type were compared to data on members file. Deferral codes were noted and unencrypted by CBS specialists. Data was analyzed and presented in ranges and percentages.

Results: We found 852 donation records. 85 % of donors were male and 27% of donors had donated before. There was a 4% error on ID discs and 6% of potential donors were deferred. The most common reason for deferral was travel deferrals.

Conclusion: This is the first study to report on the CF H Svcs Gp FWB program. CF H Svcs Gp and CBS ran a successful FWB program 2006-2009. Only 6% of donors were deferred. However, we found 4% of donors had the wrong ABO group or Rh factor recorded on their ID discs. This study gives important information to CF H Svcs Gp Blood Program for the current FWB program.

Poster Presentations

P143: Canadian Forces Health Services Remote Damage Control Resuscitation: Bringing the Best Practices in Resuscitation to Austere Environments

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Introduction: Canadian Armed Forces (CAF) elements operate in many remote areas around the world. Best practices and new North Atlantic Treaty Organization (NATO) doctrine suggests bringing blood products as far forward into these environments to provide remote damage control resuscitation (RDCR) to bleeding trauma patients.

Methodology: We reviewed current CAF options for RDCR and their stability and transport requirements to austere environments. We also reviewed other national RDCR plans and created a CAF RDCR algorithm. During the course of building this program we adopted new blood approved blood products based on clinical evidence and procedures, capable of bringing RDCR anywhere CAF operates.

Results: Before the start of the CAF RDCR program, only Canadian Blood Services approved component blood products were available in the austere environment, and this required extensive cold chain management. Other than crystalloid intravenous fluids, the only other room temperature stable adjunct for RDCR was tranexamic acid. Because of the CAF RDCR program, a Health Canada freeze-dried blood product, Fibrinogen Concentrate was identified and adopted. As well, a fresh whole blood procedure for the austere environment was produced in collaboration with Canadian Blood Services. Several gaps in capability, such as lack of a national freeze-dried plasma program were identified.

Conclusion: This is the first descriptive review of the Canadian Forces Health Services RDCR program. CAF now has the ability to conquer the tyranny of distance and extend its operational reach with safe blood products and procedures to the most austere environments in the world. Future directions will include production of Canadian freeze dried plasma.

P144: Biomarkers of Decompression Sickness in Recreational Divers

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Introduction: Compressed gas military diving operations result in increased partial pressures of inert balance gases usually nitrogen and/or helium stored in tissues and blood. Decompression to lower ambient pressures by ascent to shallower depths results in inert gas supersaturation in tissues that diffuses into the blood as gas bubbles in the venous circulation that may result in the onset of uncertain symptoms indicating decompression sickness (DCS). Despite uncertain symptoms, policy dictates the termination of diving operations in favour of HBOT for the victim. An important step in resolving uncertain symptomology is the identification of biomarkers leading to a diagnostic assay kit for DCS. We are using microarray analysis to characterize genomic biomarkers in recreational divers stricken with DCS in a Canadian multi-centre study.

Methodology: Consenting volunteer recreational divers presenting with DCS symptoms at Canadian HBOT centres donated whole blood samples (2.5 mL) into PaxGene vacutainer tubes before and after HBOT for DCS. They are were asked to donate a baseline sample 5-6 months after recovery from DCS. Purified mRNA from peripheral blood leukocytes (PBLs) underwent microarray hybridization, proprietary statistical analysis using GeneSpring, and finally repeated measures ANOVA and Benjamini-Hochberg correction at the Princess Margaret Genomics Centre, Toronto.

Results: Despite a wide range of treatment times between their last dive and HBOT (4-48 hours), six divers all appeared to experience similar genomic responses to decompression sickness. Over 600 genes showed significantly altered mean fold changes (FC) of genomic expression during DCS compared to baseline expressions. Many of the significantly altered genes appeared to be involved in pro-inflammatory roles such as CHI3L1 (FC = 1.95), a biomarker for COPD, CF, hyperoxic acute lung injury, diabetes, coronary artery disease and osteoarthritis. Others included ORM1 (FC = 1.8), a biomarker of inflammation in platelet aggregation and activation of IL-1 and TNF receptors, and STAT4 (FC = -1.95), a key regulator in the pathology of chronic inflammation. Interestingly, FCGR2A, NCF4 and FPR1 (FCs > 1.6), associated with pathogen infection, were up-regulated during decompression sickness, which is considered to be a sterile immunoinflammatory response.

Conclusion: Decompression sickness elicited a significant genomic response in PBLs in recreational scuba divers that primarily involved pro-immunoinflammatory mechanisms. Clearly, the small sample size is the result of the short Canadian diving season. To achieve a suitable sample size (n=30), we invited three HBOT centres on the USA west coast, presently in the midst of ethics proceedings, to join the study.

P145: Canadian Komatik-Ambulance - A World First?

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Introduction: The difficult and dangerous operational environment of the high arctic makes ground medical evacuation of a stretcher-casualty a difficult procedure. Weather, terrain, and air asset constraints can further complicate the evacuation process. On the penultimate day of Ex ARCTIC RAM 2016 the exercise included a ground medical evacuation of a mock stretcher-bound casualty by Light Overland Snow Vehicle (LOSV) and a modified Koma-

tik-Ambulance. A Komatik is a large toboggan-type structure that is pulled behind an LOSV. The scenario was a hypothermic patient that did not require cervical spine precautions and no intravenous therapy. A 'Spider Heater' was deployed as the primary heat source along with military sleeping bags and heating packs. The Komatik-Ambulance was expected to tolerate speeds of up to 50km/h over difficult snow and ice terrain with temperatures as low as -50C with wind chill to exposed persons. This is, by our knowledge and research review, the first recorded military movement of a stretcher patient in this manner.

Methodology: The Senior Medical Authority directly observed and documented the movement of the stretcher patient from initial management of mock hypothermia at Forward Operating Base (FOB) Intrepid Bay throughout transport of approximately 50km to Small Lake, Nunavut. Movement of the patient was from a 10-man tent to Komatik-Ambulance with three stops en-route where the patient was removed from the Komatik-Ambulance, transported into a tent on stretcher, assessed by the Medics, and then returned by stretcher to the Komatik-Ambulance. At all times a medic was with the patient in the Komatik-Ambulance and was in radio contact in case of any emergency while on the move.

Results: The simulated movement of a stretcher-bound patient by Komatik-Ambulance was successful with the casualty reporting that she remained warm and comfortable throughout the transport process with no additional injuries received and no further cold exposure during the transport. Two major issues arose during transport. First, extrication from the Komatik-Ambulance to tent was difficult due to the design of the Komatik-Ambulance. Second, medications in the Komatik-Ambulance froze due to low ambient temperature.

Conclusion: The use of a Komatik-Ambulance with LOSV for ground medical evacuation movement of a stretcher-bound patient in the high arctic is both a feasible and effective method of transport when air assets are not available.

P146: Advances and Opportunities in Telemedicine-enhanced Services: The Royal Ottawa OSI Clinic Experience

Shlik, J., MD; Hale, S., BA; Bhatla, R., MD; *Jansman-Hart, E., MSc

The Royal Ottawa Operational Stress Injury Clinic

Introduction: The Royal Ottawa Operational Stress Injury (OSI) Clinic is one of a network of OSI Clinics located across Canada that provides specialized mental health services to veteran and serving members of the Canadian Armed Forces and the Royal Canadian Mounted Police, as well as their family members. The Royal Ottawa OSI Clinic's catchment area spans from Eastern and Northeast Ontario to Western Quebec, and as far North as Nunavut. Telemedicine is a viable service delivery option aimed to increase access to care within this expansive region in a timely, flexible, and safe manner. All services, including assessment, psychiatric care and individual therapy are offered and delivered via telemedicine. This presentation will highlight the use of telemedicine at the Royal Ottawa OSI Clinic and describe the results of a client and clinician telemedicine satisfaction survey.

Methodology: Data were collected on the number of clients who used telemedicine, as well as number of sessions, interdisciplinary use, frequency of use, and types of services delivered via telemedicine over the last three years. A satisfaction survey was administered to all clients using telemedicine and all clinicians at the Royal Ottawa OSI Clinic.

Results: Telemedicine is used by all disciplines at the Royal Ottawa OSIC to provide virtually all services. However, the number of clients using telemedicine, as well as the number of telemedicine sessions, has declined over time, despite a high level of satisfaction reported by both clients and clinicians. Both groups reported satisfaction with the quality of the equipment, ease of use, ability to build rapport, and quality of care provided and received. The majority of respondents agreed that they would continue to use telemedicine in the future and would recommend telemedicine to others.

Conclusion: Telemedicine is an innovative, client-centered way of enhancing mental health care services for clients with OSIs. For clients who use telemedicine at the Royal Ottawa OSI Clinic, 50% report that they would not be able to access the services they need otherwise. From a clinical perspective, telemedicine drastically reduces travel time for clinicians, allowing them to spend more time providing care to more clients. The trends and perceptions of telemedicine use will require ongoing attention and solutions to increase use will be explored.

Occupational Health

Podium Presentations

2C02: Bridging the Gap between Universality of Service and the Physical Demands of Combat Operations – FORCEcombat.

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Department of National Defence

Introduction: The FORCE evaluation, introduced in 2013 as a predictive measure of the physical demands of Universality of Service (U of S), is a representation of tasks that all Canadian Armed Forces (CAF) members must be able to accomplish regardless of age, gender, rank or occupation. Given that the CAF is a joint force, the FORCE Evaluation might not be sufficient to ensure operational readiness of occupations with higher physical requirements. From its inception, FORCE was perceived as a standard that was not reflective of certain occupations (such as combat arms) within the Canadian Army (CA) hence the research team assessed the need to adapt the evaluation to more adequately represent the true demands of combat operations.

Methodology: A review of the Occupational Fitness Standards (OFS) (Théoret et al. 2015) demonstrated that FORCE was sufficient for most of the Army-managed occupations but did ignore tasks that did not constitute common duties that all CAF members could be called to perform. Furthermore, detailed task analyses and physiological measurements completed in 2008-10 prior to the development of FORCE (Reilly et al., 2013), had demonstrated that loads, distances and aerobic demands from tasks such as ruck marching and urban operations were inadequately assessed with the former Battle Fitness Test (BFT). Thus, PSP researchers conceptualized a test battery comprised of a 5km load bearing march (35kg) followed by FORCE performed in a circuit wearing fighting order (25kg). Prior to presenting the concept to the CA, a single-subject trial was conducted to assess if the test battery would lead to similar demands as those measured on combat-related tasks.

Results: The subject (male, 42, 78kg) wearing battle order, was instrumented with a portable metabolic analyser and a heart rate monitor. The march, performed on a treadmill (5 km/h, 0.5% grade) was followed by a 15 min rest and then by a FORCE circuit. The march and

the circuit elicited aerobic cost of 21 ml/kg/min and 37 ml/kg/min respectively, which are values that were very similar to those previously measured on combat related tasks (Reilly et al., 2013).

Conclusion: The concept of a modified FORCE Evaluation (FORCE-combat) to better represent the physical demands of combat tasks is a valuable option to provide the CA with a physical assessment to track the operational readiness of its soldiers. The concept was presented to the CA council in April 2015 and given approval to continue the research process to establish acceptable norms and safe administration guidelines for the CA to implement it as a fitness objective.

2C03: Physiological demands of FORCEcombat: An Fitness Objective for the Canadian Army

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Department of National Defence

Introduction: The metabolic demands of FORCE when performed at the minimum standard pace, ranges from 18-25mls/kg/min. Demands of Urban Operations were measured with the CA at 25-32mls/kg/min over 4 minutes (Reilly et al, 2010; Reilly et al, 2013). To better replicate current CA demands a load bearing march + FORCE loaded and completed as a circuit is collectively referred to as FORCEcombat . The FORCEcombat concept was approved at Army Council in April 2015, and will provide the CA with an invaluable resource to assist members in preparing for combat operations.

Methodology: FORCEcombat begins with a 5km loaded march (50-60minutes) wearing Battle Order (35kg total). After 5 minute rest the Day pack (10kgs) is removed, then FORCE to maximum voluntary effort as a circuit with FO (25kg). Trials were conducted with 14 Infantry (mean age=28) and 31 Army HQ Staff (23 females, mean age =41). O_2 was measured directly throughout the loaded march (Parvo Medics True One 2400), and indirectly throughout FORCE combat using HR variability.

Results: Loaded March (5km, 35kg): The metabolic demands of the march ranged from 12ml.kg.min to 32ml.kg.min independent of lean body mass and height. Heart rate drifted upwards during the march, possibly due to heat storage, decrease in efficiency, or related to a change in energy systems (>1RER).

FORCEcombat Circuit: Average circuit time for the Infantry was 5:53 min:sec (5:28 – 6:18) and 12:02min:sec (6:50 – 22:47) for HQ staff.

Demands of the circuit ranged from 24ml.kg.min to 44ml.kg.min (dependent on pace and other factors). A regression between the time to completion of the circuit and O_2 consumption was calculated.

Conclusion: With additional data from reliability trials (N=30) over multiple attempts the relationship between circuit time and Urban Operations demands will become more accurate. Current data indicate that there is a significant amount of individual variation in metabolic demands for a given circuit time. The same can be said for the loaded march, despite that speed and load are constant.

From a performance perspective, no injuries occurred as the completion of FORCE combat was self-paced. However, from these trials it was determined that due to the skill component of completing FORCE with a load, there would be a learning effect over multiple trials. Therefore, the need to complete reliability trials was highlighted (Rogers et al,

2014; Boyd et al, 2015).

2C04: Health Protection in Combat Operations during Influenza Pandemics, 1918 and 2016

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Introduction: According to Health Canada, pandemic influenza is a certain future global threat. The CAF Directorate of Force Health Protection has publicly expressed grave concern that the CAF's first line of prophylactic defence against emergent pandemic influenza, our world-class stockpile of antivirals, will expire before the end of 2016. The replacement cost is high, and if antiviral stockpiles are not replaced, then a significant gap will exist in the future between pandemic emergence and the availability of an effective vaccine. If, as Health Canada Fears, pandemic influenza takes a form as severe as that of the H1N1 pandemic of 1918-1919, then the CAF will confront a serious disease threat during this gap with no effective pharmaceutical intervention. Fortunately there is historical precedent to draw upon for guidance and lessons. While fighting in northern France in 1918, the Canadian Corps conducted high-intensity operations during its Hundred Days campaign during the peak of a deadly H1N1 outbreak. No antivirals or vaccines were available in 1918.

Methodology: This presentation will examine primary-source documents related to Canadian Corps operations and force health protection measures during the Hundred Days campaign of 1918. My analysis assesses Canadian disease casualties due to influenza, protection methods, lessons learned, and studies the impact of pandemic influenza on operational effectiveness.

Results: Colonel A.E. Snell, Deputy Director of Medical Services for the Canadian Corps, wrote in 1918 that, "a form of influenza had made its appearance amongst the troops, and had caused considerable worry to the medical authorities. By adopting every precaution, and owing to the excellent condition of the men, this disease made little headway." Preliminary analysis indicates a high degree of protection was achieved by the Canadian Army Medical Corps against pandemic influenza, without the advantages of antivirals or vaccine interventions, during a period of high-intensity operations.

Conclusion: As former CAF surgeon-general Major-General J.R. Bernier has written, "History teaches us that we often do not learn from our past with respect to preventive health efforts." The grave dangers of CAF exposure in the event of pandemic influenza means that the success of precursors in achieving high levels of force health protection against the virus without direct interventions deserves attention. Methods, lessons, and priorities in disease prevention in 1918 should be adapted to help ensure better health protection coverage for today's CAF in the event of a pandemic.

2C05: Minimum Drinking Water Quality Requirements for Disaster Response Operations

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Department of National Defence

Introduction: The Disaster Assistance Response Team (DART) is a multidisciplinary military team designed to deploy on short notice anywhere in the world, in response to situations ranging from natural disasters to complex humanitarian emergencies. A key role of the DART

is water production, purification and provision. The Canadian Forces Health Services Group (CF H Svcs Gp) is responsible for determining the minimum parameters for water potability, and subsequently to conduct quality assurance and quality control testing of drinking water. Although drinking water quality guidelines are well defined for routine operations, there is a need to develop minimum drinking water quality guidelines for disaster response operations, where transportation challenges often render conventional sampling and analysis impractical. Once developed, these guidelines must be able to be assessed in the field. Further, these guidelines must be defensible and just when assessed through both an ethical and public health lens.

Methodology: A literature review was conducted to identify existing minimum drinking water guidelines, developed for use during disaster response operations. These minimum guidelines were then assessed to determine if they could be utilized in the field using relatively unsophisticated testing equipment.

Results: Most international agencies providing water during disaster response operations rely on microbiological testing to assess water potability, while many militaries rely on both microbiological testing and some chemical analysis. However, as chemical analysis is difficult to accurately conduct in the field, this parameter was not retained by the CF H Svcs Gp as a minimum requirement. The essential parameters of water quality are E. coli and chlorine residual, but also, pH and turbidity. *E. coli* levels should be undetectable. The minimum target concentration for chlorine at point of consumption is 0.2 mg/L - this could be higher in high-risk circumstances. It is necessary to measure the water pH, since more alkaline water requires a longer disinfectant contact time or a higher free residual chlorine level to ensure adequate disinfection. Turbidity should also be assessed as it may adversely affect the efficacy of disinfection.

Conclusion: The recommended parameters for the minimum monitoring of water supplied during disaster response operations are those that best establish the risk of waterborne disease: *E. coli*, chlorine residual, pH and turbidity. E. coli is currently the best available indicator of recent faecal contamination in drinking water systems. Consequently, detection of E. coli in any drinking water system is unacceptable.

2D03: Post-traumatic Stress Disorder Trajectories following Christchurch, New Zealand Earthquake among Frontline Workers

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Introduction: Earthquakes are not a single event, and exposure to trauma may be ongoing. Understanding how front-line workers cope is important, for both their own well-being and that of the general public. We therefore investigated the mental health effects in Teachers and the Fire, Police and Ambulance services. A postal questionnaire was administered over three rounds, at 6, 12 and 18 months after the 2011 earthquake in Christchurch. The same groups in Hamilton, a demographically similar New Zealand centre, forming the referent group. The objectives were to evaluate exposure to critical incidents; determine predictors of high post-traumatic stress scores and to evaluate and identify groups with similar trajectories of PTSD over time.

Methodology: The PTSD Checklist-Civilian (PCL) assessed the presence of PTSD according to the DSM-IV criteria. Other mental health measures included the Social Provisions Scale (SPS) and the Impact of Event Scale – Revised (IES-R).

Longitudinal latent class analysis (LLCA) was used to identify groups of individuals with distinct classes of PTSD after the earthquake. The SAS Trajectory Procedure was used to determine group membership based on the trajectory of PCL scores over time.

Results: Rounds 1, 2 and 3 were completed by 226, 180 and 123 individuals respectively, a group response rate of between 22 and 25%. At baseline (round 1) there were significant differences in PTSD by occupation: of those with PTSD 76% were teachers, with additional differences by sex and total number of traumatic exposures. All of the mental health measures had at least one sum score that was significantly different by PTSD status. The LLCA had two groups, 79% in group 1 (No PTSD) and 21% group 2 (with PTSD). Significant predictors of group membership included the SPS score and the IES-R. No one changed group membership over time and the group PTSD 2 scores showed no apparent change.

Conclusion: The major group with PTSD were teachers. The reasons why teachers have such high scores is unclear, however they do have a specific role 'post disaster' and should be considered front line workers. The significant PTSD predictors include many mental health measures which are potential risk factors and could be included in primary prevention initiatives. It is clear that secondary intervention is needed, the failure either to change PCL score group membership or to improve scores over time in the PTSD group being worrisome. The limitations of the study included the cross sectional nature, the traumatic event having occurred. The weakness was the low response rate, strengths were the longitudinal design and the use of well validated questionnaires.

2E04: Adaptation of R2MR to Occupational and Environmental Requirements

*Bailey, S.M., LCol, MSW; Guest, K., MSW; Bedard, M-L., MSW

Department of National Defence

Brief Description: While the Road to Mental Readiness (R2MR) program has been developed and implemented since 2008 to provide resilience and mental health training throughout Canadian Armed Forces (CAF) members' careers, it must be further tailored and adapted to meet the unique demands of various occupations and operational environments. In addition to the career and deployment cycle mental health and resilience training that has been implemented, specialized curriculum packages have also been developed for Military Police, Search and Rescue Technicians, Imagery Analysts, Firefighters, Forensic Dental Officers, as well as families of CAF personnel. Through the use of focus groups with target audiences, pre and post tests, video testimonials and co-facilitation, the R2MR program has been able to develop specialized content to assist members of unique groups within the CAF to manage the challenges and demands of their roles.

Clinical Outcomes: The demands of military service are numerous and significant, and vary significantly among occupations and environments. While there are evidence-based cognitive behavioural skills that can assist military personnel to manage the demands not only of military service but also the daily hassles in their personal lives, application and reinforcement of the skills to relevant scenarios and challenges has the potential to increase the use and effectiveness of the skills. The R2MR program incorporates a number of strategies that enhance the relevance and adaptability of both the teaching content

and skills to each occupation/environment, including: video testimonials from experienced members of the target audience; co-facilitation with uniformed personnel of the same occupation/environment; adaptation of the Big 4+ skills to specific enabling objectives and performance objectives during occupation training; tailoring of content to all levels of experience and leadership within the occupation; use of scenarios and application of problem-focused learning to real-life situations; and integration of skill application, mentoring and coaching outside the classroom.

Patient Population: This presentation will focus on the audiences for whom R2MR has been adapted, and the steps involved in tailoring the content to meet their specific needs. Whether it involves tailoring the scenarios for a specific operational mission, or adapting the program for an occupation that is at high risk for burnout and injury, the process of identifying learning objectives, focus testing the content, and integrating the modules into existing occupation training are key to achieving the identified objectives of each version of R2MR.

Conclusion: Lessons learned and outcomes for unique R2MR packages will be highlighted.

2E05: Occupation Specific Mental Resilience Training for Military Police

*Guest, K., MSW; Bedard, M-L., MSW; Battista, A.B., LCol, MA; Bailey, S.M., LCol, MSW

Department of National Defence

Brief Description: Over the past number of years there has been an increased focus on policing and mental health issues – both in those who are policed and the police services personnel themselves. The Canadian Armed Forces (CAF) Road to Mental Readiness (R2MR) program has been adopted by many police forces across Canada, including the Royal Canadian Mounted Police (RCMP). In order to prepare CAF personnel to meet some of the unique requirements of their occupation, we have further expanded the R2MR material for our Military Police Members at the Military Police (MP) Academy in Borden Ontario. This presentation will highlight the unique aspects of developing mental health and resilience training for a population that also has a professional role in intervening with those who may be experiencing a mental health crisis.

Clinical Outcomes: The R2MR for Military Police begins with providing military police members' general mental health literacy information. Topics include definitions of mental health, declining mental health and mental illness all along the Mental Health Continuum Model; bio-psycho-social risk and protective factors that can contribute to the development of a mental health difficulty; prevalence rates of mental illness in the Canadian Armed Forces and Canadian society at large; brief overview of the more common mental illness diagnoses; and the definition and characteristics of a mental health crisis and how this temporary state of imbalance may require police involvement. Military Police are also provided information about stigma and how to challenge previously held prejudices that may contribute to discriminatory actions.

The main teaching component of this material revolves around a newly developed police response model for intervening in a mental health crisis. At the foundation of this model are solid tactical communication strategies that help military police to recognize the impact of police presence, remain calm using the Big Four+ strategies taught in other R2MR materials, and establish effective verbal and non-verbal communication strategies that will build rapport and collaboration with the individual in crisis and de-escalate the situation.

Patient Population: The program has been developed for initial occupation training and all subsequent developmental period training for Military Police Personnel, including the Military Police Officers Course. It is co-delivered at the Military Police Academy by trained members of the occupation with a mental health clinician.

Conclusion: Implemented in early 2016, the program has been well accepted by the target audiences and initial outcomes are encouraging.

3D02: Hearing Protection in 2016 -- What have we Learned?

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Introduction: According to Veterans Affairs Canada, medical conditions of the ear comprised the second highest percentage of disability benefits as of 2010. When administrative and engineering solutions to limit exposures have been maximized, the most critical intervention is to provide hearing protection devices (HPDs) that soldiers will wear consistently. Based on our research, soldiers require hearing protection that is comfortable for extended wear, integrates with their other personal protective equipment (PPE), and allows them to hear their radios, understand speech and maintain situational awareness. Although it is theoretically possible to satisfy these requirements with modern HPDs, in extreme operational environments at least one of the criteria will likely suffer. HPDs must be carefully chosen, especially for soldiers with suboptimal hearing abilities, so as to not reduce lethality and survivability on the battlefield.

Methodology: We present an overview of our work in this area, which has ranged from questionnaires, to psychoacoustic experiments, to engineering evaluation of HPD performance and noise sources, some at extreme levels of sound pressure.

Results: There are a variety of HPDs available, from passive earplugs and earmuffs, to electronic tactical communication and protection systems. Our work shows that proper selection of HPDs is affected by much more than personal preference and comfort. The wearing of PPE such as ballistic eyewear, balaclavas and gas masks can reduce the effectiveness of HPDs if they are not properly integrated. Communication while wearing HPDs is affected by the interaction of background noise, hearing ability and language fluency. The ability to communicate verbally in noise is being investigated as a criterion to assess fitness for duty in some occupations. DND's current training safety doctrine for weapon noise requires updating with advice on HPD selection and more accurate calculations of the safe number of allowable rounds with that choice. Ultimately, a range of HPDs is needed to promote user comfort and operational effectiveness in the different types and levels of noise they are exposed to. Participation in international working groups and collaboration with our allies, such as the Israeli Defence Force Medical Corps, has enhanced our ability to address the gaps in knowledge.

Conclusion: Education is essential to the proper selection of HPDs. Users must be made aware of the available options and how their choices should change according to the type of noise exposure, PPE compatibility and communication needs.

3D03: Characterizing the Performance of Hearing Protection Devices under High Level Impulse Noises

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Introduction: The current Canada Labour Code noise regulation is suitable for the prevention of Noise Induced Hearing Loss (NIHL) when a human subject is exposed to steady state noises. However, for the Canadian Armed Forces (CAF), the work environment can often be characterized by high-level impulse noise such as the firing of weapons. Modern Hearing Protection Devices (HPDs) has been used successfully to protect operators from being exposed to excessive steady state noises. The primary mechanism of these protection devices is through attenuation, which is often referred to as insertion loss. While the measurement of HPD insertion loss in impulse noise is defined in ANSI/ASA S12.42, the performance ratings of HPDs are normally measured by the manufacturer according to existing standards using fixed-frequency steady state noises. Since there is no existing standard for rating the performance of HPDs under high-level impulse noises, the level of protection offered by commercial off-the-shelf HPDs under high-level impulse noise is unknown to the user.

Methodology: Pressure-time signals were recorded for two different CAF machine guns (M3M FN Herstal MG and C6), at various shooter head positions on an open-field shooting range. The performance of several different types of HPD and HPD combinations was measured, ranging from passive earplugs, to non-linear devices, to tactical communication and protection systems. The performance of the HPDs was also measured in the laboratory in steady-state noise for comparison.

Results: The weapon noise signals, from the shooter position, were as high as 170 dB peak for the M3M FN Herstal and 167 dB peak for the C6. Analysis of the HPD insertion loss data is in progress. The results can be used to calculate the allowed number of exposures (ANE) for these weapons while wearing the various HPDs.

Conclusion: We will present details of test plan and the effectiveness of multiple HPD configurations at various shooter head positions, with noises from the firing of CAF machine guns.

3D04: Evaluation and Selection of Laser Eye Protection for Canadian Maritime Patrol Aircrew

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Introduction: Laser strikes against aircraft have become a worldwide issue with the proliferation of cheap, high powered, hand held lasers. In 2015 military aircrew were routinely being exposed to distracting levels of laser radiation during flight in theatre. To mitigate the risk of exposure to aircrew, trials were carried out with commercial of the shelf (COTS) laser eye protection (LEP). The present study was conducted to ensure the COTS LEP was able to provide adequate protection to aircrew without interfering with other safety aspects of flight.

Methodology: The optical properties of six different models of LEP from two companies (Iridian and Phillips) were tested by the Quality Engineering Test Establishment (QETE) using an Agilent Cary 6000i spectrophotometer to establish optical density (OD) and transmission levels of wavelengths between 200nm and 1400nm. Further testing was carried out by the Aerospace Engineering Test Establishment (AETE) to ensure flight compatibility with the LEP. Finally a multi-question user satisfaction survey was sent to all LEP users in theatre to assess task compatibility and user acceptance.

Results: Spectrophotometer data showed OD as a function of wavelength for all of the COTS options. The minimum OD of 2.0 at the 532nm wavelength was met by five of the six LEP models tested (±5% at the 95% CI). Additionally, the Iridian models had an OD of greater than 5.0 at the 1060nm wavelength (±5% at the 95% CI). Problems with light transmission at night, colour distortion of visual cues, distortion, and glare were found during flight compatibility testing. LEP with polycarbonate lenses was found to have greater glare than LEP with glass lenses. Five of the six options were found to be unsuitable for flight operations at night. Iridian LEP with glass lenses was chosen for use in theatre. User feedback showed mixed results for user acceptance of the chosen LEP in theatre.

Conclusion: The present study details a way forward for the selection of LEP in operations when comparing currently existing commercial systems. Further research into aircrew laser eye protection needs to be carried out in order to protect aircrew against the emerging threat of laser exposure during operations.

4E01: Overview of the Special Operations Mental Agility Training for the Canadian Special Operations Forces Command

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Department of National Defence

Brief Description: The Canadian Special Operations Forces Command (CANSOFCOM) strategic plan acknowledges the importance of preserving CANSOFCOM personnel over the course of their careers, thus identifying a Tiered Resiliency Program as a decisive force sustainment activity. CANSOFCOM has partnered with the Canadian Forces Morale and Welfare Services and Canadian Forces Health Services to develop enhanced resilience training. This presentation provides an overview of the Special Operations Mental Agility (SOMA) training and how it has been tailored and customized to the unique demands of the CANSOFCOM environment.

Clinical Outcomes: SOMA is mental skills training aimed at enhancing performance and resilience during training, operations, in garrison, and at home. SOMA aims to equip CANSOFCOM personnel with a cognitive and behavioural skillset to effectively handle the unique demands of CANSOFCOM service and to facilitate performance excellence in the Special Operations operational context through systematic development and refinement of performance-enhancing cognitive skills.

Patient Population: SOMA is a suite of training targeting CANSOFCOM operators, support and specialist personnel, and leadership. While this suite of training will have consistent core content, specific packages will be tailored to unique roles within CANSOFCOM. The SOMA baseline training has been developed and all current and new CANSOFCOM members will receive this 2 day intensive resilience/mental skills training throughout 2016-2017. Future expansion of this suite of training will include components tailored to leadership, the inclusion of core content at appropriate junctures in existing CANSOFCOM courseware, and the development of a family resilience package.

CANSOFCOM specific aspects of SOMA include the use of co-facilitators to assist with delivery of training and conveying the message that resilience/mental readiness training is a significant operational requisite, and the incorporation of short unscripted video clips of serving members speaking to their experiences within CANSOFCOM. The video content emphasizes the rewarding and challenging aspects of the job, how mental skills can be learned and leveraged to maximize operational performance and well-being, experiences recovering from burnout or other mental health issues, and aims to reduce stigma to care-seeking while facilitating buy-in of training.

Conclusion: SOMA is a customized resilience package which is grounded in the latest research in the areas of neuroscience, performance enhancement, sports and performance psychology, and draws upon the best practices of the R2MR program and related Allied Forces programs. Nested in the context of the CANSOFCOM environment, this training aims to enable operational excellence and longevity of personnel.

4E02: Psychological Safety in the Military Workplace

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Brief Description: The introduction of the *National Standard of Canada for Psychological Health and Safety in the Workplace* was a milestone in Canadian occupational health and safety. This presentation will: (a) briefly describe the Standard; (b) present findings from the Case Study Research Project (CSRP), an implementation trial in which the Standard was field tested by a diverse array of 41 Canadian organizations; and (c) apply CSRP findings to the military workplace, The knowledge gained from the CSRP will be discussed with reference to the Canadian military context, including recommendations for enhancing the psychological safety of military personnel.

Clinical Outcomes: Key outcomes of the Case Study Research Project included: 1. Degree of Commitment by organizations to address psychological safety in their workforce; 2. Level of progress in adopting the *Standard*, measured by an implementation rating scale; 3. Identification and assessment of psychological hazards relevant to their organizational setting; 4. Implementation of initiatives within the workplace designed to mitigate psychological risks to workers in that setting. Determination of outcomes utilized a mixed methods approach, combining quantitative and qualitative data to chart the "journey" of each organization in implementing the *Standard*.

Patient Population: The CSRP is an organizational-level implementation trial, not a clinical study. Therefore, "patients" were organizations considered as entities whose unique work settings and cultures yielded a unique configuration of barriers and facilitators to implementation of the *Standard*.

Conclusion: The introduction of the *Standard* represents a unique opportunity to advance psychological health and safety in Canadian workplaces, including the military. Many of the issues that arise in organizations seeking to enhance psychological safety are shared across different kinds of workplaces and organizational cultures; but at the same time, each organization has a unique profile of hazards and effective interventions. The Canadian military is in fundamental ways unlike other workplaces, but can nonetheless derive critical knowledge from the experiences of diverse organizations that have addressed psychological safety, adapting this knowledge to the military context.

4E03: Occupation Specific Mental Resilience Training for Search and Rescue Technicians

*Guest, K., MSW; Bailey, S., LCol, MSW; *Smit, G., CWO, MSM

Department of National Defence

Brief Description: While the Road to Mental Readiness (R2MR) program has been gradually integrated throughout the career development periods and deployment cycle since 2008, there remain specialized groups within the Canadian Armed Forces (CAF) who face unique challenges as a result of the demands of their occupation or environment. Among these groups are Search and Rescue Technicians (SAR Techs), who perform missions in Canada on a daily basis yet do not benefit from the same pre and post deployment screenings and training as large overseas contingents do. This presentation will provide an overview of how R2MR has been tailored and adapted to meet the unique needs of SAR Techs throughout their careers.

Clinical Outcomes: In response to the CAF Search and Rescue Unit Morale Profile, which found that the Search and Rescue Technicians (SAR Techs) were reporting moderate to high levels of stress symptoms, and could be at a higher risk for burnout and reduced performance capability, the Royal Canadian Air Force partnered with Canadian Forces Health Services Group to develop enhanced mental health curriculum to be embedded into SAR Techs' training and development. Since November 2014, curriculum has been developed to build upon the resilience skills already taught to CAF members and contextualize them to the search and rescue environment, as well as identify additional key resilience skills which have been proven to optimize performance for this occupation, and maintain long term mental health. The training also aims to identify specific operational/occupational stressors and demands, and enable SAR Techs to monitor their health and well-being and that of their peers and to seek out the available resources to support them in doing so.

Patient Population: Tailored content has been developed for SAR Techs attending their initial occupation training as well as subsequent leadership training, in addition to a delta package for all currently serving SAR Techs employed in Squadrons across Canada. Additionally, integration of annual R2MR content into dive training aims to further integrate the mental recovery and prevention aspects of the R2MR training reinforce the importance of self-assessment and individual recovery activities.

Conclusion: This presentation will describe how R2MR has been tailored to meet the unique demands of an entire occupation in order to better prepare them to manage the unique demands and stressors specific to their occupation.

5C04: Neck-Supported Mass Study: Finding Relationships between Helmet System Mass Properties and Neck Muscle Activation

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Department of National Defence

Introduction: Wearing a helmet is primarily for operator head impact protection. Also, it has become the platform for mounting Head Mounted System (HMS) such as night vision goggles. Ultimately, the mass of any HMS is supported by the neck. Recent evidence suggests in CH-146 Griffon Helicopter aircrew, this additional neck supported mass likely contributes as a primary cause of neck pain associated with

over exertion of neck musculature. Designing HMSs to not only be lighter, but also more optimally distribute the mass about the head may reduce over exertion injuries in the neck. This study endeavours to understand how mass distribution affects neck musculature activation/exertion levels.

Methodology: Twenty reserve members of the Canadian Armed Forces participated in a study to determine the effect of mass distribution on neck muscle activation levels while performing a series of simulated aircrew tasks. Mass properties examined included: total mass, center of mass offset in the anterior-posterior direction, and moment of inertia about the long axis of the head. Tasks were selected to represent both pilot and flight engineer tasks (air craft ingress, scanning, equipment handling, etc.). Neck muscle activity was measured using linear enveloped electromyography, normalized to maximum voluntary contractions (MVC), for five neck muscles bilaterally (upper erector spinae; upper trapezius; levator scapulae; splenius capitis; and sternocleidomastoid).

Results: Average level of muscle activation across all tasks increased as total mass of the head mounted system increased (1.9 kg = 14.3 ± 9.2 %MVC; 2.5 kg = 16.3 ± 11.4 %MVC; 2.9 kg = 16.7 ± 11.9 %MVC) and moment of inertia increased (350 kg*cm^2 = 13.6 ± 7.6 %MVC; 450 kg*cm^2 = 14.3 ± 9.1 %MVC; 550 kg*cm^2 = 17.6 ± 12.1 %MVC). Muscle activation increased as the center of mass was moved forward; however muscle activation remained the same when the mass was moved backward (-2 cm = 16.4 ± 13.9 %MVC; 0 cm = 16.4 ± 11.4 %MVC; 2 cm = 17.7 ± 13.9 %MVC).

Conclusion: The results show that as total mass and moment of inertia decrease, muscle activation/exertion decreases thus reducing the risk of a muscle over exertion injuries. More in depth analysis of the results can become a first step in mapping out the design space for future HMSs. Understanding how each of the mass distribution properties affect muscle activation can lead to HMSs with optimally distributed mass to improve performance and reduce the risk of pain and injury.

5D01: Who Has Been Part of CAF for the Past 40 Years? A Description of the CF Cancer and Mortality Study II Cohort

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Introduction: The Department of National Defence (DND), Veterans Affairs Canada (VAC), and Statistics Canada (STC) have collaborated in conducting a record linkage study that looks at the mortality and cancer morbidity outcomes of all Regular Force and Reserve Class C personnel enrolled between 1976 and 2015. In this presentation, we will describe the study population in detail.

Methodology: A cohort file was built and validated using Central Computerized Pay System data. These data include all Canadian Armed Forces (CAF) Regular Force and Reserve C personnel enrolled between January 1976 and May 2015. The data were validated and supplied to STC for probabilistic linkage to the Canadian Mortality Database. Following the completion of the linkage, DND and VAC epidemiologists will conduct descriptive analyses to describe both the still serving and released cohorts, both in terms of demographics as well as career-related factors (including time served, time since release, description of deployment experience, occupations, etc.).

Results: At the time of linkage, approximately 325,000 individuals were eligible for inclusion into the cohort, with the majority no longer serving as Regular Force or Class C Reservists. We will present an overview of the cohort, by sex, by enrollment status, and rank, and will provide an overview of the different explanatory variables, including patterns in deployment (by type, length and/or frequency), occupation, employment length, reason for release, as well as possible changes in these factors based on different eras.

Conclusion: The results presented here describe the complete CAF Regular Force and Reserve C population over a 40-year period. To our knowledge, CF CAMS II is the only study looking at a full military cohort over such a long follow-up period, as well as across multiple peacekeeping and active combat missions. This information is methodologically important to better understanding and explaining the mortality burden within this very unique population. It also has long-term implications for the development of effective policies and programs for promoting, protecting, and caring for the health of Canada's serving and released military personnel.

5D02: Epidemiological Surveillance of Suicide in the Canadian Armed Forces from 1995 to 2015 – Trends and Risk Factors

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Department of National Defence

Introduction: The Directorate of Force Health Protection (D FHP) has been conducting epidemiological surveillance of suicide mortality in the Canadian Armed Forces (CAF) since 1995. Prior to 2014, annual reports consisted primarily of an overview of the rates of suicide across the Canadian Armed Forces, without any study of possible explanatory factors. Longer surveillance time frames, changes in the CAF's military role, and additional surveillance tools (such as the Military Professional Technical Suicide Report (MPTSR)) have contributed to expanding and enhancing the annual report. This presentation provides an overview of the 2016 annual suicide surveillance report on suicide amongst CAF Regular Force males between 1995 and 2015, inclusive.

Methodology: This report upon which this presentation is based describes crude suicide rates from 1995 to 2015, comparisons between the Canadian population and the CAF using standardized mortality ratios (SMRs), and suicide rates by deployment history using SMRs and direct standardization. It also examines variation in suicide rate by command and, using data from the MPTSR, looks at the prevalence of other suicide risk factors in suicides which occurred in 2015.

Results: Between 1995 and 2015, there were no statistically significant increases in suicide rates. The number of Regular Force male suicides was not statistically different than that expected based on Canadian male suicide rates. Rate ratios indicated that there was a trend for those with a history of deployment to be at an increased risk of suicide compared to those who have never been deployed; however the difference was not statistically significant. These rate ratios also highlighted that being part of the Army command increased the risk of suicide, relative to those who were part of the Air Force or of other commands. Underlying risk factors identified in the MPTSR included prior mood and/or anxiety disorders, and a wide range and frequency of other stressors (e.g. relationship breakdown, gambling, work performance problems).

Conclusion: Overall, suicide rates in the CAF did not increase sta-

tistically over time. History of deployment was not a statistically significant risk factor for suicide in the CAF, but those in the combat arms were at statistically significantly increased risk of taking their own lives. Given the multifactorial nature of suicide and of the high prevalence of other underlying factors, these findings must be interpreted with the understanding that command may be confounded by other explanatory variables that cannot be identified due to small numbers.

Poster Presentations

P156: Acute Effects of Mild Hypoxia between 8,000 to 14,000 Feet above Sea-level

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Introduction: Hypoxic hypoxia (HH) results from insufficient oxygen (O_2) available to the lungs due to reduction in partial pressure at the alveolar level, which can be caused by environmental factors, such as altitude. The physiological and cognitive effects at high altitude (> 12,000 ft.) above sea level (ASL) are well understood in terms of gaseous exchange, times of useful consciousness, and physical reaction. However, the onset of HH symptoms below 10,000 ft. is often unrecognized and the effects of unprotected exposure to HH on humans are less certain. In unpressurized aircraft and without supplemental O_2 supply, aircrew might be exposed to intermittent mild HH symptoms. It has been suggested that symptoms consistent with HH may arise at a mean altitude near 8,500 ft. (Smith, 2007). In this study, we investigated the acute effects of mild HH between 8,000 and 14,000 ft. ASL.

Methodology: This study was conducted in a hypobaric chamber at the Defence Research and Development Canada (DRDC) - Toronto Research Centre from September 2015 to April 2016. Sixteen volunteer helicopter pilots from the Royal Canadian Air Force (RCAF) were randomly exposed to four levels of altitude (8,000, 10,000, 12,000, and 14,000 ft.) on separate days. In each condition, participants periodically exercised on an ergometer at a randomized workload (no exercise (OW), light exercise (30W) and moderate exercise (60W)) before performing a simulated rotary wing flight task and a cognitive test battery (delayed matching-to-sample, n-back, and the Stroop test). Cerebral regional and finger pulse oxyhemoglobin saturation level, heart and respiration rates were continuously monitored at ground level and altitude. Self-report questionnaires assessing subjective signs and symptoms of HH, mood and fatigue were also administered to participants at different stages of each experimental condition.

Results: Data collection has been completed successfully with 16 participants. Analysis of data and statistical evaluation are presently underway. Preliminary results show a noted decrease in cerebral regional and pulse O_2 level, between 8,000 and 14,000 ft. ASL. Hypoxic symptoms were also reported at all altitudes, but their frequency increased at 12,000 ft. and above suggesting that the pilots experienced mild hypoxia.

Conclusion: The results of the current investigation will contribute to the development of new guidelines for the duration and frequency of altitude exposure, and any potential limitations for single and repeated exposures at the aforementioned altitude.

P157: Mental Health Services Use and Barriers to Mental Health Care among CAF Personnel with a Mental Disorder: A Population-Based Survey Comparing Serving Regular Force and Reserve Force Personnel who Returned from an Afghanistan Deployment

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Department of National Defence

Introduction: The mission in Afghanistan has been shown to have an impact on diagnosed mental disorders in Canadian Armed Forces (CAF) personnel; however, little is known about whether mental health services use differs between Regular Force (RegF) and Reserve Force (ResF) personnel who returned from this mission. The current study compares the patterns of services-use and endorsed barriers to care between serving Regular and Reserve Force members who deployed in-support of the mission in Afghanistan and were identified as having a mental disorder.

Methodology: Data were obtained from the 2013 CAF Mental Health Survey of currently serving personnel. Personnel who met the World Health Organization's Composite International Diagnostic Interview (WHO-CIDI) version 3 criteria for at least one mental disorder in the past year were included in the analysis (weighted N: RegF= 5320; ResF= 840). Predictors of service use and barriers to mental health care, as well as their association with each other, will be explored using regression techniques.

Results: Only preliminary findings are available at this time but more detailed results will be presented. Among personnel with a mental disorder, indication of any mental health resources (MHR) use for problems concerning emotions, mental health, or use of alcohol or drugs in the past 12-months was greater among RegF (73.6 % [95%CI: 70.3- 76.9]) than among ResF (59.5% [95%CI: 55.1-64.0]). RegF members had a higher reported use of both professional MHR (66.8% [95%CI: 63.2-70.3]) and non-professional MHR (74.3% [95%CI: 71.1-77.6]) than did ResF, whose reported usage was 50.0% [95%CI: 45.5-54.5] and 63.4% [95%CI: 59.0-67.8] for professional and non-professional MHRs, respectively. The pattern of identified barriers to mental health care were similar between RegF and ResF but some differences were identified (e.g., both RegF and ResF identified highly with mental health care-seeking as harmful to personnel's CAF career; being seen as weak was a more highly reported barrier among RegF; a preference to deal with mental health concerns on one's own was reported more highly among ResF).

Conclusion: Preliminary findings indicate that currently serving RegF and ResF personnel with a mental disorder, and who had previously deployed in-support of the mission in Afghanistan, are largely seeking mental health services. However, differences were noted between RegF and ResF personnel in their mental health services use and in their pattern of reported barriers to mental health care. These findings can potentially inform programs that focus on reducing barriers to mental health care in the CAF.

P158: Impact of Gas Masks on Index of Efforts and Breathing Pattern

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Introduction: The gas mask is used to protect military and non-military subjects exposed to respiratory hazards (CBRN agents). The aim of the study was to evaluate the impact of the gas mask on respiratory

patterns and indexes of the respiratory effort.

Methodology: We are completing our study with 14 healthy subjects to evaluate breathing patterns, index of respiratory efforts and blood gases. Seven conditions have been tested in a randomized order: at rest, during effort (on a tread mill, standardized at 7 METs for all subjects) and during induced hypoxemia with and without a mask (C4, Airboss Defence, Bromont, Canada). Airway pressure, inspiratory and expiratory flows were measured. An esophageal catheter was introduced at the beginning of the study to measure esophageal pressure (Peso) and calculate indexes of respiratory effort (PTPeso, WOB). SpO_2 was continuously measured and capillary blood bases were drawn at the end of each condition. Each condition lasted 10 minutes, data of the last 2 minutes at a steady state were considered for analyses.

Results: The preliminary analyses based on 10 subjects are presented here. Comparing the wearing of the gas mask and without, most of the respiratory index increased in the tested conditions (at rest, during induced hypoxemia and during effort). At rest, in 8 out of 10 healthy subject the indexes of effort were higher with the gas mask, a statistical trend was observed with the WOB (0.22±0.13 vs. 0.28±0.10 J/cycle; p = 0.059), the PTPes (101±35 vs. 122±47 cmH2O*s; p=0.21) and SwingPeso (4.4±2.0 vs. 5.3±2.0 cmH2O; p=0.13). During the effort, the respiratory index increased (WOB 4.0±2.6 vs. 5.6±3.2; p=0.10; PTPeso 406±211 vs. 606±65; p=0.04; SwingPeso 14.8±8.1 vs. 21.8±9.0; p=0.13). There was no difference for the breathing pattern and arterial blood gases data with and without mask. Data for induced hypoxemia are under analysis. We measured on bench the inspiratory and expiratory resistances of the tested gas mask (C4: inspiratory resistances = 3.2 cmH2O at 1 L/sec; expiratory resistances = 0.9 cmH2O at 1 L/sec). This may explain in part the increased work of breathing with masks.

Conclusion: This study demonstrated an increase of the indexes of respiratory effort during an exercise with the gas mask. This study is the first to directly assess the indexes of efforts with esophageal pressure in this situation. Our results and method may be used as a reference for evaluating tolerance with different designs of gas masks.

P159: Exercise Arctic Ram – The Dangers of Cariboo Kisses

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Introduction: The Arctic Response Company Group concept has existed for almost a decade. Currently there is no definitive answer to the question of what pathology can be expected on Exercise in the high arctic in order to allow Canadian Medical Officers to prepare not only materials and equipment but also to update their own treatment knowledge base. There is no current summary of information from the Disease Injury Surveillance System on arctic injury patterns and on some occasions injury patterns have not been collected. Exercise ARCTIC RAM 2016 data was collected and analyzed to answer this important question. Uniquely, during this exercise an arctic parachute drop also occurred. This study allows the practicing Medical Officer a clear view of what to expect when on a short arctic exercise as operations in an arctic environment present a unique medical pathology and risks for morbidity and mortality.

Methodology: Data was prospectively collected at the Unit Medical Station in Resolute Bay, Nunavut, in the field at Forward Operating Base (FOB) Intrepid Bay, and during end-of-exercise medical evaluations. The average temperature high was -19C and low was -26C with a mean of -22C, all without wind chill. A total of 11 days' of data was collected. Patients in the UMS included SAR Techs, 3PPCLI, 38CBG, attached American troops, and invited media.

Results: Over the 11 days of data collection a total of 71 patients were seen across 98 patient interactions. The average age was 22. The total number of cold weather injury patients was 66 with 85 cold weather injuries reported across those individuals. There was one hypothermic patient and one severe frostbite injury that required medical evacuation. The 85 cold weather injuries spanned the spectrum of frostbite injuries, and affected bodily locations as follows: 29% face and neck, 29% nose, 25% hands, 14% feet, and 2% ears. There were 5 minor trauma patients seen, one of which required radiological investigations.

Conclusion: Medical Officer preparation for arctic exercises should include review of up to date practices of frostbite management. In addition, education of soldiers regarding awareness of early signs of frostbite and mitigation techniques is essential to reduce avoidable injury that can affect operational effectiveness.

P160: An Assessment of Respirable Hazards at Canadian-occupied Op UNIFIER Sites in Ukraine

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Department of National Defence

Introduction: To address Canadian Armed Forces (CAF) requirements for health surveillance on international operations, a Deployable Health Hazard Assessment Team (DHHAT) conducted an assessment of respirable health hazards in support of Op UNIFIER. From 31 October to 20 November 2015, the DHHAT visited Canadian-occupied sites including the International Peacekeeping and Security Center (IPSC) in Yavoriv and the Ukraine Ministry of Defence Demining Center in Kamyanets-Podilsky (KP). Levels of airborne contaminants were compared against occupational and environmental health guidelines to determine risks and guide protective mitigation requirements over a standard 6-month deployment period.

Methodology: Due to Ukraine industries, the air was sampled for a wide variety of aerosols and pollutants including Particulate Matter (PM10 and PM2.5), respirable and inhalable dust, silica, metals, polycyclic aromatic hydrocarbons (PAHs), nitrogen oxides (NOx) and sulphur oxides (SOx). At each identified location, samples were collected at a minimum of two sites over several days where CAF personnel live or work, to assure representative sampling for exposure, including contributions from environmental and operational conditions.

Results: Occupational sampling for respirable and inhalable dust, silica, metals, PAHs, NOx and SOx did not identify any compounds of potential concern. However local environmental conditions in KP, which included seasonal burning of leaves and a temperature inversion, contributed to PM10 levels of 82 – 250 µg/m3 while PM2.5 levels ranged from 37 – 75 µg/m3; results which the US EPA's Air Quality Index (AQI) categorizes as "unhealthy." CAF personnel at KP were observed to be avoiding outdoor exposures during the evening, or when conditions were visibly poor. Environmental conditions at the IPSC and surrounding training area were noticeably improved over KP. At PM10 levels from 10 – 51 µg/m3 and PM2.5 levels between 7 – 34 µg/m3, the IPSC and surrounding training area saw most of the PM readings falling into the range of "moderate," according to the AQI.

Conclusion: The overall outdoor air quality should not have adverse long term health effects on deployed CAF members, however the seasonal burning of leaves at KP combined with a temperature inversion

did at times produce unhealthy conditions. An AQI of "unhealthy" means that respiratory symptoms are possible in the general population, however for generally healthy individuals, the short-term health effects from exposure to the range of PM levels at KP would be minimal while the likelihood for long-term adverse health effects would be unlikely.

P161: Application of Quality Improvement Techniques to Administrative Processes in a Type III Canadian Forces Health Services Centre

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Department of National Defence

Introduction: Within the health services clinics, granting of sick leave based on clinical evidence and practice standards is a daily process. Depending on the amount of sick leave involved for the particular episode/condition, there are specific approval authorities and guiding instructions to ensure appropriate administration. Administrative procedures such as sick leave administration constitutes a significant portion of clinic (specifically clerical) resources, therefore it is prudent to continuously evaluate such processes to identify opportunities for enhancing efficiency. We herein present an application of LEAN methodology to the sick leave administrative process.

Methodology: We sought to first create a process-map for sick leave administration. Representatives from each stakeholder group met and contributed to produce a consensus on the steps of the current process for sick leave administration. Value stream mapping was then done in order to identify any non-value-adding steps. Both the process and value-stream maps were subsequently compared against Canadian Forces Health Services Group policies and instructions surrounding sick leave. A run-chart analysis for the amount of time required to process sick leave is currently in progress.

Results: The process map identified a range of nine to 17 steps involved in the administration of sick leave for each patient per episode/condition. Results of the value stream mapping identified that the time required accordingly ranged from 15.5 hours to over 2 weeks from the initial clinician-patient encounter. Two non-value-adding steps were identified. Results of run-chart analysis are expected in Fall 2016 and are expected to form a baseline from which to measure efficacy of future implemented changes to the process.

Conclusion: Routine evaluation of clinic processes using a standard validated approach will identify opportunities to enhance efficiency and efficacious use of clinic resources. Education and engagement of front-line clinical staff in quality improvement approaches is expected to improve front-line understanding of the health services system and its associated policies, and generate the buy-in necessary for future changes in the system.

P162: Integration Across Organizational and Service Boundaries through Implementation of a Goal-oriented Case Management Assessment and Intervention Tool for the Canadian Forces Health Services (CFHS) Case Management (CM) Program

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Department of National Defence

Brief Description: The mission of CFHS CM program is to provide goal-oriented assessment and care planning designed to assist Canadian Armed Forces (CAF) members and families in achieving positive health, psychosocial and physical outcomes. Research has demonstrated that effective CM interventions result in positive patient outcomes, efficient use of health care resources and increased patient satisfaction. CFHS CMs assist patients to navigate the health care system, link professionals involved in the patient's circle of care, enable patients and families to achieve targeted goals and educate patients, families and health care providers. The focus for the CM program has been to develop a documentation record which integrates assessments, links nursing classifications to goals, outcomes and plans in order to guide patients on return to work or medical release. The development of relevant, quantifiable program measures which are linked to organizational strategic objectives is the approach identified by the program. As a result, the program has embarked on an opportunity to capture data which can be used for evaluation of indicators which measure CM interventions that impact successful transition across organizational services and boundaries. Early interventions by CM's such as education, safety nets, medical and social supports across the continuum of care well before the medical release occurs can positively impact outcomes and ensure seamless transition across organizations. Care planning is central to ensuring that goals and needs are aligned with services and access to care. Individualized care plans derived from identified patient needs and goals provide clear direction, improved patient engagement, support patient education and encourage self-management.

Clinical Outcomes: Support provided by CM's ensures positive outcomes for patients which can be measured through increased compliance to treatment, improved understanding of health conditions and medical categories, timely and appropriate access to health care, seamless navigation during transition of care and increased patient satisfaction. The newly implemented electronic documentation system will support data collection, enable tracking and monitoring of patient goals and clinical decision-making as well as provide a basis for program evaluation and outcome measurement.

Patient Population: The CM program is available to serving CAF members who are returning to work or concluding their military careers due to health issues incurred during service.

Conclusion: The CM electronic record will enable improved data collection and provide indicators which support program evaluation and outcomes measurement for QI. By monitoring goals through retrospective chart audits the CM program will be able to capture data for the purpose of evaluation and clinical decision-making.

P164: Reliability of Performance and Demands of FORCEcombat: A Fitness Objective for the Canadian Army

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Department of National Defence

Introduction: A load-bearing march (35kg) followed by a loaded FORCE (25kg) circuit is collectively referred to as FORCEcombat. The goal of this study was to establish the number of times one should complete FORCEcombat to achieve reliable performance (Boyd et al, 2015). The impact of pre-fatigue caused by heavy load carriage has been suggested as affecting Canadian Army (CA) members' ability to conduct combat/urban operations and, although this has not been quantified with the CA, it has been reflected in research on other militaries (Patterson et al. 2006).

Methodology: Trials were conducted with 33 CA members at Garrison

Petawawa; drawn from primarily combat arms trades. After completing a graded exercise test to VO$_2$max and FORCE, participants were separated into two groups matched by relative VO$_2$max and Lean Body Mass, known to affect FORCEcombat performance. Over 3 weeks, Group A performed FORCEcombat and Group B performed only the loaded FORCE circuit four times each at best effort. For the fifth trial, Group B performed FORCEcombat in its entirety and Group A only the loaded FORCE circuit to determine the effect of the load-bearing march on circuit times. Metabolic demands were captured using HR variability.

Results: Participant ages ranged from 19-46, mass 54-114kg, and VO$_2$max 32.6-71.3 mL/kg/min. Twenty-seven of the participants completed all five trials to best effort and were included in the analysis. Mean circuit time on the fourth attempt for Group A was 506s and 428s for Group B. Group A's performance times improved by 31s (6%) between the first and second trials, 28s (5%) between the second and third, and then worsened 6s (1%) for the fourth. Likewise, on average Group B improved 15s (3%) between each of the first three trials and then had a 5s (1%) improvement for the fourth. Removing the load-bearing march for Group A's fifth trial resulted in a mean improvement of 47s (9%), whereas adding the march for Group B increased their mean completion time by 22s (5%).

Conclusion: As FORCEcombat performance is maximal but self-paced, it was hypothesized that due to the skill component of completing FORCE with a load, there would be a learning effect over multiple trials and research indicates by trial 3-4 performance can be expected to plateau with circuit type tests (Rogers et al, 2014; Boyd et al, 2015). This was confirmed for these participants on FORCEcombat. In addition, the pre-fatigue effect of the load-bearing march was hypothesised to have an effect on circuit performance, which was also confirmed and quantified by the results.

P165: Mortality in Canada›s Serving Military and Veterans – Methods Used to Quantify the Mortality Burden in CF CAMS II Cohort

*Simkus K., MPH[1,2]; VanTil L., DVM MSc[1]; Rolland-Harris, E., PhD[2]

[1]Veterans Affairs Canada; [2]Department of National Defence

Introduction: The Canadian Armed Forces (CAF) and Veterans Affairs Canada (VAC) are both interested in health outcomes of serving members of Canada's military, and extending these outcomes beyond their period of service. Mortality rates are an important health outcome regularly monitored for Canadians, but more difficult to study for CAF personnel. This presentation describes the epidemiological methods used to ascertain the burden of mortality in still serving and released Regular Force and Class C personnel enrolled between 1976 and 2015.

Methodology: The Canadian Forces Cancer and Mortality Study (CF CAMS) II epidemiological methods into the ascertainment of the burden of injury in still serving and released personnel are based on the methods employed in the CF CAMS I study.

A cohort file, based on validated CAF pay data, was created and validated by Department of National Defence (DND) epidemiologists. In addition to demographic information, the full cohort file also includes potential explanatory variables including enrollment and release dates, occupational data, dates and locations of deployments, and rank(s). Extrapolated explanatory variables include total length of service and time since last release.

The cohort file will be probabilistically linked by Statistics Canada using Social Insurance Numbers (when possible) as a highly weighted matching variable. The resultant linked data will allow for many analyses over time. In all cases where a comparison population is required (e.g. standardized mortality ratios (SMR)), the Canadian population will be used as the comparison population, unless otherwise specified.

Results: This presentation will describe: (1) The methods used to build and validate the cohort file used for this study; (2) The linkage approaches applied in linking the cohort file to the Canadian Mortality Database; (3) The analytic framework that will be applied to quantify the mortality burden in the CAF, and to identify and delve into patterns of potential interest.

Conclusion: Our conclusions will be based on our experience in building and linking a complete cohort file and in describing the mortality experience of Regular Force and Reserve Class C personnel. We are hopeful that the application of methodologically sound epidemiological approaches will result in robust evidence that can be used to inform the development of effective policies and programs for promoting, protecting, and caring for the health of Canada's serving and released military personnel.

P166: Developing Nominal Rolls of Deployed Canadian Armed Forces Personnel for the Canadian Forces Cancer and Mortality Study II: Challenges and Lessons Learned

*Simkus, K., MPH[1,2]; Weeks, M., PhD[2]; Rolland-Harris, E., PhD[2]

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Introduction: Nominal rolls are developed to identify all military personnel who served in a war, action, or unit; they can be used for a variety of purposes, including promoting comradeship and Veteran identity, recognition and commemoration, administering benefits, and conducting research.

Past experience has demonstrated the considerable time and effort required to develop nominal rolls for deployments, as no comprehensive deployment database currently exists. Recently, Veterans Affairs Canada (VAC) faced challenges developing a retrospective nominal roll of Canadian military Veterans who had participated in chemical warfare testing during the 1940s-70s (Thompson et al., 2010), which was used to inform Veterans and survivors about compensation benefits. This process required data collection from several channels, including the collection of additional names supplied by the Department of National Defence (DND), VAC, sources in the United Kingdom, family members, Veterans, media articles, and the Veterans Review and Appeal Board.

The Canadian Forces Cancer and Mortality Study II (CF CAMS II) is a cohort study of serving and released Canadian Armed Forces (CAF) Regular Force and Class C Reserve personnel who enrolled between 1976 and 2015. Nominal rolls are currently being developed for both Rwanda (1993—1996) and Bosnia-Herzegovina (1992—1995) deployments, in the hopes of using them to examine mortality outcomes specifically in these subgroups.

Methodology: A literature review will be conducted to further explore methodological issues related to developing nominal rolls. DND's Human Resources Management System will provide medals and honours data related to the relevant deployments. Posting and pay data from DND's Central Computerised Pay System will be also be examined for deployment history. Further research will be conducted to identify any additional sources of potential validation of these nominal rolls. Also, in developing the nominal rolls, we will consider the lessons learned from VAC's experience.

Results: At the time of presentation, we will describe the approaches taken in building nominal rolls for Rwanda and Bosnia-Herzegovina deployments for use in the CF CAMS II study, and will outline the challenges and limitations experienced in developing these nominal rolls.

Conclusion: Our conclusions will be based on the specific challenges and limitations we encounter in building the nominal rolls. Our findings will be discussed in terms of potential improvements to data management that may assist in documenting the health effects of military service later in life.

Physical Health and Rehabilitation

Podium Presentations

1B01: Identifying Military Families and Veterans in the Canadian Primary Care Sentinel Surveillance Network (CPCSSN) Database to Study the Health of Military Families and Veterans

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Introduction: The Canadian Armed Forces has health information on their active personnel but little information about the health of the families of their personnel or of Veterans who have been discharged. The Canadian Primary Care Sentinel Surveillance Network (CPCCSSN) is a network of 11 primary care research networks which extracts de-identified health information from Electronic Medical Records on over 1.3 million Canadians from 1200 practices. It is a rich source of primary care health information and is well positioned to improve understanding of military families and veterans receiving care in primary care settings. The CPCSSN is working with primary care clinics operated by Calian Health in Winnipeg to extract EMR data. De-identified patient information with flags identifying specific patient's in the Military Family program are included in the data.

Research Objectives: (1) Develop and test the creation of an identifier for military families in the CPCSSN database as part of the Military Family program; (2) Develop and test the creation of an identifier for veterans in the CPCSSN database; (3) Use the CPCSSN database to explore chronic health conditions in the partners and children of Military personnel and in patients who self-identify as military veterans.

Methodology: Data extraction from these patients will be similar for other patients in the practice. A similar process will be undertaken to develop an identifier for military veterans. Once the identifiers have been validated at the Winnipeg clinics they will be added to the CPCSSN database for rollout to other network sites and other clinics participating in Calian's program provide care to military families.

Results: De-identified patient data will be analyzed as a cohort of patients from military families to determine types of health problems for which they see primary care practitioners and rates of chronic illness. This project is still in the preliminary stages and the first data extract containing this cohort is beginning to be processed. Further analysis will be reported at the conference.

Conclusion: The use of primary care Electronic Medical Record data to better understand the health care of military families is an important step in understanding the health and health needs of military families.

2C01: If You Build It, They Will Come… or Will They?: A New CAF Physical Fitness Strategy Emphasising the Influence of Environmental Factors

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Brief Description: The physical fitness of our sailors, soldiers and aviators is an essential and critical component of mission readiness. Although daily group physical fitness training remains popular and strongly encouraged, it is not a reality across the Canadian Armed Forces with nearly 1/3 of personnel remaining inactive.

A new Canadian Armed Forces Physical Fitness Strategy is therefore currently being drafted by a multi-stakeholder working group, under the direction of Assistant Commander Military Personnel Command. This strategy is based on McLeroy's (1988) Social Ecological Model of Health, which posits that a behaviour such as physical activity is influenced by a complex web of determinants at the individual, inter-personal, organisational, community and national levels. Several years of baseline data collection related to individual behaviours as well as to the social, policy and built environment determinants of physical activity are underpinning this strategy. Base/wing working groups will be established to review local results related to physical activity and choose from a variety of evidence-based interventions to improve the situation.

Clinical Outcomes: Several pre-post measures will be used to assess effectiveness of this strategy. Organisational implementation studies will be undertaken to determine uptake of the potential strategies provided to local working groups. Culture of fitness surveys were administered in 2013 and will be repeated in 2018 to assess changes in perceptions of the built, social and polity environment in relation to physical activity. Objective measures of physical activity (i.e. with activity trackers) have been taken on a representative sample of CAF personnel pre-strategy and will also be repeated post implementation. Finally, Fitness Profile results (annual assessment of operational and health-related fitness of all CAF personnel) will be analysed annually to track changes in overall CAF fitness over time.

Patient Population: The strategy is designed to affect all CAF personnel. The CDS is the CAF champion for fitness and he has tasked all military L1 commanders to champion this initiative within their commands. The national working group currently drafting the strategy also contains representation from all L1 commands.

Conclusion: It is incumbent upon the CAF to provide the facilities and support required to make physical fitness the norm for everyone in uniform. This ambitious but attainable objective can only be achieved by aligning efforts and acting at every level from L0 down to the individual member. Upon its launch in 2017-2018, the CAF Physical Fitness Strategy will serve to integrate these efforts into an operationally focused framework with attainable and measurable outcomes.

3C01: Advances in Clinical Translation of Bidirectional Upper Limb Prostheses

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Introduction: Upper limb amputation is a devastating loss suffered by military members. Advanced prosthetic limbs are being developed, but dexterous hand function cannot be achieved without sensation. In order to fully realize the potential of advanced prosthetic limbs, relevant sensory feedback must be integrated to close the control loop. Targeted reinnervation is a procedure that increases the number of motor control sites in upper limb amputation. Sensory reinnervation associated with the procedure has provided new avenues to explore closed loop control by restoring sensory feedback channels. Cutaneous sensation is experienced as referred to the missing hand and arm with near normal sensory thresholds, allowing real-time tactile feedback during active motor control. Recent discoveries of movement perception in reinnervated muscles open the possibility of providing sensation of prosthetic movement to the amputee. Returning physiologically appropriate sensory feedback from a prosthetic limb may address a major barrier to acceptance of prosthetic limbs.

Methodology: This presentation reviews the surgical techniques for sensory reinnervation, explores findings in tactile, kinesthetic and movement sensation, and demonstrates translational work towards fully integrated sensory-motor prostheses. Cutaneous mechanosensitive and kinesthetic percept mapping, human psychophysics, and functional assessments (in the laboratory and through home-use trial) are used to characterize the sensory and functional outcomes.

Results: Subjects show cutaneous reinnervation referred to nerve transfers, with inter-individual variation. Detailed hand maps with multiple percept sites related to tactile stimulation allow real time tactile feedback during simultaneous motor control of a robotic arm. New tactor developments have allowed on board off the shelf prosthetic limb systems to be used for in lab experiments as well as take home trials.

In addition, using the kinesthetic illusion, individual movement percepts projected to the missing hand, wrist, or elbow were found in the reinnervated muscles of 6 amputee subjects. Using movement percepts linked to the function of dexterous prosthetic hands participants were able to accurately determine the close point of a robotic hand without the use of vision. With simultaneous volitional motor control using reinnervated muscles, accurate close point of the robotic hand could be sensed. New vibrational tactor devices will allow clinical socket integration for translational applications.

Conclusion: This work demonstrates the ability of amputee subjects to experience physiologically matched tactile and kinesthetic hand sensations during simultaneous motor control, in wearable socket systems. Results provide evidence to suggest that current approaches are at a state of maturity to soon provide integrated multimodality control and feedback for advanced limb systems.

3C02: Development of a New Method of Measuring Upper Limb Function using Motion Capture and Eye Tracking During Functional Tasks

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Introduction: Advanced prostheses and new technology to improve upper limb function has motivated a search for more sensitive assessment techniques. Common clinical methods of assessing upper limb function include tasks where performance is quantified as time to completion. While this may provide a measure of efficiency, it is not sensitive to compensatory movements often employed by individuals with upper limb impairment, and does not assess the visual attention required when the limb has poor sensation and impaired motor control.

We developed a new method of measuring upper limb performance during functional tasks that combines motion capture and eye tracking to provide a complete picture of upper limb sensory motor function. The goal of this work was (1) to develop two functional tasks that mimic activities of daily living requiring precision, accuracy, force modulation, lateral movements, and crossing midline; and (2) to create a comprehensive set of normative upper limb kinematics and eye tracking metrics for these tasks that can be used as benchmarks for comparison to clinical populations.

Methodology: Data was collected from 20 able-bodied participants. Participants performed 20 repetitions of two functional upper limb tasks in 3 different conditions. Data was collected using a 12-camera optoelectronic VICON motion capture system and a Dikablis eye tracking system. Angular joint kinematics were computed from low-pass filtered motion capture data using custom written MATLAB codes. Eye tracking metrics were assessed by fixation times on areas of interest.

Results: Kinematics and eye tracking metrics were segmented according to pre-defined phases of reach-grasp-release for functional task breakdown. Joint kinematics and end-effector measures showed consistent performance and standard deviations between participants with reasonable variability. The eye tracking metrics showed clear patterns of gaze leading hand, with fixation moving to the next target during grasp. Several trends were observed from the data: wrist and elbow kinematics suggest greater variability in the way participants grasp a close cup (top grasp, closer to body), as opposed to a far cup. Grip aperture was more variable and larger for the far cup, likely due to the difference in grip patterns required.

Conclusion: A normative set of upper limb kinematics and eye tracking metrics for two functional tasks has been established that incorporate critical elements of accuracy and risk. Similar to common gait assessment practices, the norms will be used as a benchmark for assessing upper limb impairments, advanced assistive technologies, and performance improvements over time.

3C03: Preliminary Results from the Correlation between Analgesics & Long Term Function (CALF) following Ankle Injuries Study

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Introduction: Recent practice guidelines report strong evidence that a short course of non-steroidal anti-inflammatory drugs (NSAIDs) may decrease pain and improve function following acute lateral ankle sprain (LAS). However, reports of greater swelling and static instability in subjects with LAS receiving NSAIDs have led to a concern that such medications may adversely affect acute ligament healing and thereby delay rehabilitation. Such studies have also been criticized for short-term follow-ups, limited outcome measures and an inability to articulate whether the observed effects result from analgesic or anti-inflammatory effect of NSAIDs, or both. Therefore, the objective of this pragmatic randomized controlled trial (RCT) is to determine the effect of adding non-opioid analgesics to a standardized rehabilitation

program over longer follow-ups on functional outcome measures.

Methodology: Canadian Armed Forces (CAF) members reporting to Garrison Petawawa with a grade I/II LAS sustained within 48 hours were invited to participate in this RCT. All eligible subjects were provided a standardized rehabilitation program and randomized to receive either; no medication, or a 7 day course of: acetaminophen 500mg four times daily, celecoxib 100mg twice daily, or naproxen 500mg twice daily. The primary outcome of this study is the mean difference between groups in the Foot & Ankle Abilities Measure from baseline to 3 months. Secondary outcomes include the mean difference between groups in clinical measures of pain, swelling, mobility, static and dynamic stability at 2, 4 & 52 weeks. Health resource consumption and days until return-to-work will also be compared.

Results: To date, 48 CAF members were screened for eligibility, 15 were ineligible, 2 refused participation, and 31 have been enrolled and randomized into either the; rehabilitation only (n=10, 32±10.5years), acetaminophen (n=6, 30.3±5.12years), celecoxib (n=9, 28.7±8.3years), or naproxen (n=6, 29±3.5years) group. Between baseline and 2 weeks, subjects receiving acetaminophen or naproxen demonstrated clinically relevant changes in pain, while subjects receiving acetaminophen, celecoxib or rehabilitation only demonstrated clinically relevant changes in self-reported function. Between baseline and 4 weeks, subjects randomized to receive acetaminophen, celecoxib or rehabilitation only demonstrated clinically relevant changes in pain, while all groups demonstrated clinically relevant changes in self-reported function.

Conclusion: The pragmatic nature of this RCT and the training demands of CAF members have resulted in challenges in subject recruitment and enrollment. To date, differences between groups in pain and/or self-reported function have been observed. The results of this study will address some of the limitations of the current research on using non-opioid analgesics in the management of ligament injuries & provide practical clinical guidance on the effect of adjunct pharmacological management of individuals with LAS.

3C04: Exploring the Delivery of a Quality Parasport Program for Veterans with a Physical Disability

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Introduction: Sport participation among military Veterans with a physical disability has increased due to the physical, social, and psychological benefits that emerge from participation post-injury (Brittain & Green, 2012). As the popularity of programs increase, it is important to determine whether Veterans have access to quality parasport programs and experiences. A quality program is suggested to be one that contains the following elements (Martin Ginis and colleagues, under review): autonomy; belongingness; challenge; engagement; mastery; and meaning. The purpose of the current study is to explore (a) whether these elements are currently delivered to Veterans with a physical disability participating in parasport programs, and (b) how these elements are achieved.

Methodology: A case study was conducted of a Veteran organization in the United Kingdom. Semi-structured interviews took place with three staff members involved in developing and delivering parasport programming, and program documentation (e.g. program guides,

annual reports) was collected. A thematic analysis was conducted on the interviews and documents to critically explore for the presence and delivery of quality elements. Data were first analyzed inductively to explore the program's methods of achieving and delivering quality parasport experiences. Following development of Martin Ginis and colleagues' conceptualization of quality participation, the data were then analyzed deductively to examine whether views of quality matched the six elements of quality participation.

Results: Results indicated that five of the six quality elements were delivered in the parasport programs, particularly: belongingness, meaning, challenge, mastery, and autonomy. Engagement did not emerge as an element but rather an outcome of quality participation. Findings also demonstrated methods through which these elements could be achieved. For example, meaning was attained through a focus on participants giving back to the organization over time, and the development of peer mentor-mentee relationships, with the expectation that individuals who received aid and support as mentees would return as mentors to assist and guide future Veterans. A further finding indicated that the main focus of the organization on developing a strong social framework (i.e. belongingness) impacted the way in which the other quality elements were achieved.

Conclusion: This study presents the first look at the delivery of quality parasport programs for Veterans with a physical disability. It fills critical gaps in knowledge by providing a case study exemplifying how quality parasport programs can be developed and delivered so as to promote optimal parasport participation and important psychosocial outcomes for Veterans with a physical disability.

3D01: Hearing Problems in Canadian Armed Forces Veterans – 2010 and 2013 Life After Service Surveys

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Introduction: Hearing loss is a known hazard of military service but prevalence has not been assessed for Canadian Armed Forces Veterans (former members). The consequences are costly in quality of life and societal liabilities, including service-related disability benefits. The Life After Service Studies (LASS) used two measures of self-reported hearing problems including the Health Utilities Index (HUI3) hearing attribute module. In the 2013 Canadian Health Measures Survey, the HUI3 module underestimated the prevalence of audiometric hearing impairment. The implications of this finding were explored. Knowledge of the extent and correlates of hearing problems in Veterans is needed to inform prevention and mitigation strategies but have not been documented for this at-risk population.

Methodology: Self-reported hearing problems were measured in Regular Force Veterans using a single question adapted from the Participation and Activity Limitation Survey (LASS 2010) and the HUI3 (LASS 2013). Prevalences were compared to the general population using the 2010 Canadian Community Health Survey and to Veterans Affairs Canada (VAC) disability assessment for service-related hearing loss and tinnitus. Risk indicators were identified with logistic regression.

Results: Self-reported hearing problem prevalence in CAF Regular Force Veterans was 27.8% (26.3-29.4%) using the single question in 2010 and 8.5% (7.4%-9.8%) using the HUI3 module in 2013. Prevalence measured by HUI3 in the Canadian general population after adjust-

ing for age and sex to match the Veterans in 2013 was 2.2% (1.9-2.5%). Hearing problems were more prevalent in Veterans under age 50 than in the general population. After adjusting for age and sex, hearing problems were associated with socioeconomic disadvantages, Army, physical and mental health conditions, chronic pain, activity restrictions, stress, dissatisfaction, low social support and difficult adjustment to civilian life. Of those with VAC disability benefits for ear diagnoses, more reported hearing problems by the single question (97%) than the HUI3 module (54%).

Conclusion: Hearing problems are more prevalent in recent CAF Veterans than the general Canadian population and prevalence varies by self-report method. Hearing problems are more likely in Veteran subpopulations at a younger age than in the general Canadian population, and in those with markers of poorer well-being including socioeconomic disadvantages, chronic health problems and role disability. Given the CHMS 2013 findings, self-report hearing findings are less prevalent than audiometric hearing impairment. These findings have implications for services and research in the prevention, mitigation and measurement of hearing problems and impairment in Canadian Veterans.

5C01: Effectiveness of Directional Preference to Guide Treatment in Canadian Armed Forces Members Suffering from Low Back Pain

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Introduction: Low back pain (LBP) is a leading cause for disability in Canadian Armed Forces (CAF) members. Efficacious and cost-effective management for LBP is thus essential to maintaining operational capabilities. Although physical, occupational and psychological stresses differ considerably from the general population, management strategies for military personnel are often extrapolated from the civilian population. In the latter, directional preference (DP) was shown useful to guide treatment of LBP, but no studies have evaluated this in military personnel.

Methodology: A pragmatic quasi-experimental study including 44 consenting CAF members with LBP was conducted at CFB Borden, Ontario, Canada. Participants received physiotherapy interventions at the base physiotherapy section (experimental group) or in the community (control group). Group allocation was based on patient availability and caseload. Patients in the experimental group (n=22) were assessed for DP and received matching interventions. Patients without a confirmed DP by the 4th visit were treated based on current guidelines. Patients in the control group (n=22) received interventions as determined by their treating physiotherapist, excluding any DP approach. Data were collected at baseline, at 1-month and at 3-month follow-up using self-administered questionnaires regarding pain (intensity, location, frequency), disability, medication, and self-rated improvements (pain, function, overall status). Work loss and health care utilization were measured at 3 months using electronic health records. Treatment effects for continuous variables were assessed with ANOVA, *t*-tests, or Mann-Whitney *U*-tests. Categorical variables were compared with Chi-squared or Fisher exact tests.

Results: Participants had a mean age of 35.9 ±9.4 years, 67.4% were male, and 46.5% had chronic symptoms (>3 months). A DP was observed in 90.9% of patients in the experimental group. Statistically significant differences, favoring the experimental group,

were observed for pain intensity (Δ 1 month: 1.9/10; CI 95%; 0.97-2.89; Δ 3 months: 1.3/10; CI 95%: 0.35-2.31), disability (Δ 1 month: 4.3/24; CI 95%: 2.12-6.38; Δ 3 months: 3.5/24; CI 95%; 1.59-5.33), and self-rated improvement at 1 month (pain: 86.4% vs 57.1%; function: 81.8% vs 47.6%; overall status: 86.4% vs 57.1%) and at 3 months (pain: 95.5% vs 71.1%; overall status: 95.5% vs 66.7%) with p-values.

Conclusion: Our data suggest that DP-guided management is more effective than usual care physiotherapy to reduce pain and improve function in CAF members with LBP. Our findings are particularly useful to inform clinicians and policy makers to improve management strategies for CAF members.

5C02: Military Members with a Recurrence of Low Back Pain 1 Year after Injury have Differences in Trunk Muscle Activation Patterns and Functional Tests Compared to Those that did not Re-injure

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Introduction: Low back re-injury rates are high (>40%), with repeat injuries a key risk factor for developing chronic low back pain. Trunk muscles provide stability to the inherently unstable spine, with studies showing that in those deemed recovered from a low back injury (LBI), muscle activity patterns differ from healthy controls and differences exist in LBI participants classified as clinically unstable versus stable (passive testing). Unstable participants utilized bracing strategies to complete a lifting task, thought to compensate for decreased passive stiffness. In a quest to better predict re-injury, this project determined if differences existed in trunk muscle activation patterns and clinical tests between those who experienced a re-injury and those who did not at 1-year follow-up.

Methodology: 32 LBI participants recruited from the Canadian Forces Base Halifax clinic, participated in this prospective cohort study. Baseline measures including demographic, clinical assessments (instability, pain and function), occupational activity level, abdominal and back extensor strength (torque in Nm) and surface electromyography (EMG) from 24 trunk muscle sites during a standardized dynamic lift-and-replace task were recorded within 12 weeks of their injury when the participant was deemed recovered (low pain and high function scores). At 1-year follow-up, participants were classified in the re-injury group if they had accessed the medical system for a LBI injury. Two-factor ANOVAs tested for amplitude and temporal EMG pattern differences between groups and among muscles for abdominals and back separately. Demographic and clinical test were compared between groups using t-test and chi-square testing.

Results: At 1-year, 15/32 participants re-injured. The only significant difference between groups for demographic variables was VAS (p<0.05) where the re-injury group had a higher score. There was one significant clinical variable difference (p<0.005), where the re-injury group were more likely to fail the most difficult and moderate levels of the Functional Movement Screen rotary stability test. Significant group main effects (p<0.05) were found for the EMG patterns capturing higher activation amplitudes (back and abdominals) and temporal differences, seen as lower back extensor responsiveness to the flexion moment, in the re-injury group.

Conclusion: Re-injury group EMG patterns showed higher active stiffness through co-activation and altered flexion moment responses indicating a bracing strategy, aimed to increase stability. The rotary stability finding, which could be considered a clinical neuromuscular test, corroborates the EMG findings; both imply a stability deficit. These results support moving toward active/neural system testing in the clinical assessment of re-injury risk, as passive stability testing was not informative.

5C03: The Development and Preliminary Validation of a Three-Dimensional Fitts'-Based Cervical Aiming Task to Evaluate Loading Factors in Military Rotary Pilots

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Introduction: To describe the development and preliminary evaluation of a three-dimensional (3-D) Fitts'-based cervical aiming task as a tool to evaluate function and control of the head/neck complex.

The globally reported prevalence of neck pain in military rotary pilots ranges from 57-85% [1] and may possibly be "attributed to the use of night vision goggles (NVG) and to a number of additional factors such as anthropometrics, posture, vibration, mission length, physical fitness, and helmet fit or load" [2]. Given the limited efficacy [3-6] of head re-positioning tasks in quantifying kinesthetic deficits associated with neck pain, we developed a more deterministic approach using a Fitts' Law-based paradigm [3], [7] to evaluate the potential kinesthetic deficits that may be induced by NVGs and other head supported loads. This study describes the development and preliminary validation of this performance-based functional assessment of the neck.

Methodology: Two different visual target acquisition systems (VTAS) have been explored: (1) Arduino-Mega 2560 (10 bit) with Adafruit LEDs and (2) NI-USB-6001 (14-bit) with tri-colour LEDs. Each system uses multiple 100 mm diameter round solar panels arranged in pairs with each pair of targets separated by 70° and positioned 2 m from the subject. A head-mounted laser was used to facilitate interaction between the subject and each pair of solar panel targets by changing the colour of the LEDs. Nominally the LEDs are red and change to blue upon the laser striking the solar panel and to green when the laser remains continuously on the solar panel for a period greater than 300 ms. Immediately after perceiving the green LED colour, subjects were instructed to move their head as rapidly as possible to acquire the next target. Each system was designed and evaluated for feasibility taking verification and validation principles [8] into consideration by assessing the impact of the infrared (IR) light pulses (~870nm) from the Qualisys cameras (Oqus) on LED signal stability.

Results: Despite our best efforts with the Arduino-based VTAS we were not able to eliminate the effects of IR light interference on the solar panel and the jitter-like effects observed and recorded from the analog LED signal. However, given that acceptable LED signal stability was achieved with the NI-USB-6001 VTAS, future research will focus on determining the between session reliability and the effects of head supported mass and whole body vibration on movement time.

Conclusion: It is anticipated that movement time will provide a reliable indication of functional impairment potentially induced in participants subjected to vibration whilst wearing a helmet and replica NVGs.

6A01: Using a Virtual Training Environment to Examine Cognition and Visual Perception in Stroke Survivors.

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Introduction: Effective rehabilitation strategies are needed for Canadians who survive brain injury to regain proficiency in their daily activities. Virtual training environments such as the Computer-Assisted Rehabilitation Environment (CAREN) system have been integrated rapidly into rehabilitation programs to help individuals with brain injury regain the competence to move back to their community life. However, research on eye motion changes and vision behavior for guiding movement is limited in brain injury patients. In this project, we combine the CAREN system and eye-tracking (Tobii Glasses) to characterize the strategies that stroke survivors use to collect visual information from a virtual environment and their decision-making process.

Methodology: We plan to recruit 12 stroke survivors and 12 age-matched healthy control participants. Both groups will walk for 200 meters on the CAREN while wearing the Tobii Glasses that record their eye motion. Along the way, participants will be required to perform mathematical calculations and respond to three unexpected events, including a flying bird, a rolling ball, and a moving vehicle. These events are designed to provide three different levels of urgency for the participants in terms of making appropriate responses while walking. A mixed ANOVA will be used to compare changes in gait and eye-tracking behavior between the stroke and control sample.

Results: Up to date, we have synchronized the Tobii Glasses with the CAREN System, which allows us to examine eye behaviors during different walking phases. A pilot study has been completed on eight university students. By quantifying the time delay from displaying mathematical equations to correctly reporting the results, we can estimate the reaction time of this control group, and latterly compare to the patient group. We also examined the participants' response to the unexpected events, calculating the time delay from head rotation to gait pattern changes. With these findings in hand, we expect to find different gaze patterns recorded in the stroke sample. Differences in the visual stimulus response (timing and type) and visual exploration strategies in stroke survivors will provide insights into their vigilance and decision-making processes, which will ultimately help design a rehabilitation program improving cognitive and reactive abilities.

Conclusion: In a controlled virtual environment, we are able to record stroke survivors' eye motions along with data on locomotion performance. Knowledge gained from this study may improve our understanding on visual-motion integration, and help design training protocols that enhance rehabilitation outcomes.

6A02: Immunohistochemical Evidence of Cerebellar Damage after Primary Blast-induced Traumatic Brain Injury in the Rat

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Department of National Defence

Introduction: The role of primary blast in blast-induced traumatic brain injury (TBI) is controversial. Few clinical cases have been doc-

umented 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. In response to Canadian Forces Health Services Group (CF H Svcs Gp) requirements, Defence Research and Development Canada (DRDC) recently initiated a Blast Injury Program focusing on primary blast-induced TBI. This report describes changes in the cerebellum after primary blast exposure.

Methodology: Male Sprague-Dawley (SD) rats (350 – 400 g) were stabilized in plastic sleeves and 3% isoflurane (in oxygen) anaesthetic was administered for a minimum of 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 6 msec positive duration). This system has been developed so that simulated single pulse head-only "primary blast" exposure is accomplished with no concussive and minimal whiplash effects. After exposure, rats were observed for 1 day, 1 week, 4 weeks, 6 weeks or 12 weeks before being sacrificed. For immunohistochemistry, rats were perfused and post-fixed with 10% formaldehyde. Changes in the expression of neurofilament (NFH), glial fibrillary acid protein (GFAP), phosphorylated NFH (pNFH), IBA-1, myelin basic protein (MBP) and degenerated MBP (dMBP) were investigated using their respective antibodies and confocal microscopy.

Results: No significant changes in the expression of NFH, GFAP or IBA-1 were observed at any time point after primary blast. However, the expression of pNFH, an indicator of axonal damage, was increased at the Purkinje layers of the cerebellum 1 day after blast, and this change persisted until at least 12 weeks post exposure. Moreover, most pNFH stains were located on axons and cell membranes of Purkinje neurons in control animals. In contrast, significant intracellular staining was observed in these neurons after primary blast. For MBP staining, although there was no change in the total amount of MBP at any time point, the ratio between dMBP and MBP was significantly increased at the Purkinje layer, the granular layer and white matters of the cerebellum at all times post exposure, indicating myelin degeneration.

Conclusion: The cerebellum has rarely been studied after primary blast in the past, mainly because of the complexity of its structure. In the present study, we showed significant damage in various layers of the cerebellum after primary blast. This may help to understand the mechanisms of primary blast and develop countermeasures against this type of injury.

6C01: Physical and Mental Health Status of Homeless Veterans in Canada

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Introduction: Veteran homelessness is an issue gaining in visibility. However, homelessness usually comes with many physical and mental health issues. A better knowledge of the physical and mental health status of homeless veterans would help better target services.

Our goal with this paper is to describe the physical and mental health status of Canadian veterans who are homeless.

Methodology: The data come from a Canadian multisite randomized trial, *At Home/Chez soi*, that studies the effectiveness and efficiency of a *Housing First* program combined with a recovery-oriented approach to care. The participants are a volunteer sample of 99 homeless or precariously housed veterans suffering from severe and persistent mental health problems. The data come from self-reported measures administered at baseline that describe chronic health conditions (CMC), head injuries, trauma (ACE), community functioning (MCAS), and mental health (MINI).

Results: Data analysis will be reformed during the summer. We will draw a clinically relevant portrait of the health status of homeless veterans.

Conclusion: The discussion will focus on the implications of our results on service needs.

Poster Presentations

P113: A Feasibility Study of a CAREN Assessment for mTBI Patients with and without Prism Glasses

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Brief Description: A mild traumatic brain injury (mTBI) has diverse clinical outcomes, including difficulty processing sensory information. The consequences of sensory dysfunction include disturbed posture and gait, and compensatory increased cognitive processing demands, which result in increased symptomology and activity avoidance. Prism glasses may help patients with visual dysfunction post mTBI, including Visual Midline Shift Syndrome (VMSS); however, assessment of effectiveness, using posture and gait analysis, has included neither testing for other sensory modality deficits (i.e.: vestibular), nor a full biomechanical assessment (Padula et al 2009). Using the CAREN system at The Ottawa Hospital Rehabilitation Centre, a set of assessment exercises will be developed to identify spatial perception deficits in patients who have mild brain injuries and to determine if those deficits are only visual in nature. We will also determine whether prescribed prism glasses improve balance and symptomology. Our secondary goal is the design and evaluation of a new sensory and spatial perception assessment suite on the CAREN that will be beneficial to multiple patient populations, including the military members that receive treatment with the CAREN.

Clinical Outcomes: Current clinical assessment values for patients with persisting symptoms post mTBI will be compared to the information created with the new assessment exercises developed in the CAREN, using motion capture and force plate measurements to evaluate patient performance, posture, balance, and gait. Data collection will be done during patients' usual treatment times.

Patient Population: Study patients will be selected from those with persisting symptoms post mTBI referred to physiotherapy at The Ottawa Hospital Rehabilitation Centre. As a feasibility study, data from 24 participants will be collected: 8 neurologically healthy controls, 8 patients with mTBI with persisting symptoms not identified as requiring prism glasses, and 8 patients with mTBI with persisting symptoms that currently use prism glasses.

Conclusion: The movement outcome measures and patients' symptom reporting will identify patient specific deficits, guide rehabilitation treatment, and provide insight into underlying neural mechanisms of VMSS for both civilian and military populations.

P114: Algorithmic Detection of Hand and Finger Fractures in the Canadian Armed Forces, 2014-2015: Validation of Linked Electronic Health Record and Health Insurance Data for Use in Population Health Surveillance

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Introduction: Hand and finger fractures (HFF) are the most common fracture site among military personnel and present a significant occupational risk to Canadian Armed Forces (CAF) personnel. One Canadian study of workplace safety estimated that each case of HFF is associated with an average of 46 lost work days per fracture and $6990 CAD in lost wages, health care costs and rehabilitation.

The implementation of the Canadian Forces Health Evaluations and Reporting Outcomes (CF-HERO) surveillance program has expanded the use of routinely collected health to study serious injuries in CAF. The objective of this study was to develop and validate an algorithm to identify HFF among CAF personnel using a combination of clinical assessment and hospital insurance billing data.

Methodology: The CAF Master Patient Index (MPI) was used to identify all Regular Force personnel enlisted between 01 Jan 2014 and 31 Dec 2015. For these personnel, CAF Blue Cross (BC) health insurance data was obtained along with provincial and territorial billing codes for emergency visits, hospitalizations, diagnostic imaging and surgical or therapeutic interventions.

BC physician and hospital billing codes were mapped to the Canadian Institute for Health Information Clinical Classification of Interventions (CIHI-CCI) coding scheme, and then assigned a level of anatomic specificity (phalanges, carpals, metacarpals, undefined) and data quality (poor to excellent).

Clinical assessment data from the Canadian Forces Health Information System (CFHIS) were then reviewed and assigned similar levels of confidence in the location and detail of HFF.

BC and CFHIS data were deterministically linked by service number and the clinical relationships were computed for each Regular Force personnel. A random sample of cases identified as HFF-positive by the algorithm was extracted and the health records were manually reviewed to confirm the fracture site and incidence (e.g. new or follow-up case).

Results: The linked data identified 326 CAF personnel with a moderate or high likelihood of HFF (97.5% of cases) in 2014-2015. Based on previously published estimates, 14,996 lost days of work and $2.3 million (CAD) in direct costs were attributable to HFF during the 24-month study period.

Conclusion: HFF is a significant workplace hazard for CAF personnel, with significant operational and resource impacts. Implications for CAF injury prevention initiatives and research directions to inform whole-body fracture algorithms will be discussed.

P115: Development of a Clinical Tool to Track Rehabilitation Progress and Functional Outcomes for CAREN-based Treatment of Mild Traumatic Brain Injury and Related Dysfunctions

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Department of National Defence

Brief Description: Ten to twenty percent of Canadian Armed Forces (CAF) members experience delayed recovery (> 3 months) following a mild traumatic brain injury (mTBI). For these cases, novel therapies to address rehabilitation goals, such as the Computer Assisted Rehabilitation Environment (CAREN) virtual reality (VR) system, are sometimes employed. The CAREN provides an immersive environment that allows a CAF Physical Therapy Officer (PTO) to explore VR scenarios with the patient in a safe manner. This treatment modality can easily be added as an adjunctive rehabilitation tool for our members with delayed recovery from mTBI. However, there are no standard treatment guidelines for use of CAREN in rehabilitation. Therefore, our goal was to capture lessons learned and to identify common elements in order to develop clinical guidelines and outcome measures for the use of CAREN in military rehabilitation.

Clinical Outcomes: Lessons learned from physical therapists and current practice at the Canadian Forces Health Service Centre Ottawa, previous CAREN-based case studies, CIMVHR Forum Virtual Reality focus group (2015), led to compilation of preferred evidence-based clinical outcome measures to administer, including DGI, SCAT3, MOCA, SSQ, DGI, and HiMAT. Additional functional outcome measures were selected to capture progress throughout CAREN intervention, including goals, session time, recovery time, number of treatment sessions, and pre-post SSQ.

Patient Population: CAF military personnel with mTBI or related dysfunction (e.g., vestibular), acquired from work-related exposure (e.g., blast injury) or trauma. Members had to be able to tolerate a visual display and should not present with severe visual impairment or motion sickness.

Conclusion: The CAREN's multifaceted applications and adaptability make it an ideal tool for PTO's to specifically target interventions for each patient's unique needs. These same inherent qualities however, render randomized control trials challenging as treatment protocols can be highly variable from patient to patient. Our clinical assessment tool reflects the intervention time and average recovery time, patient progress, response to intervention, pre and post outcome measures, and goal achievement. Ultimately this will facilitate data compilation for future clinical research. Our CAREN discharge summary for the mTBI population should ease research and help therapists track patient's progress using CAREN. The applicability of this tool to other forms of VR such as OculusRift or Wii could also be considered in the future.

P116: Development of a Simplified Motion Capture Cluster Marker set to Enhance Rehabilitation in the CAREN System

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University of Alberta; Glenrose Rehabilitation Hospital

Introduction: The Computer-Assisted Rehabilitation Environment (CAREN) system at the Glenrose Rehabilitation Hospital is used to treat both military and civilian patients. Military patients accessing the system commonly have lower limb impairment such as amputation. Although the CAREN is used extensively, there are currently no standard methods of assessing gait parameters for CAREN treadmill walking. Gait assessment relies on motion capture via body-affixed markers, requiring a trained clinician to appropriately attach the markers to the patient. In particular, gait assessment in individuals with amputation using any of the well-established marker placement sets (e.g., Helen-Hayes Marker Set (HMS)), is limited because marker placement on the prosthesis is not clearly defined. We propose a simplified motion capture Cluster Marker Set (CMS) that generates sufficiently accurate

gait kinematics while allowing fast and easy marker attachment by clinicians accessing the CAREN.

Methodology: Ten able-bodied individuals participated in this study. After attaching two marker sets – a HMS and the CMS consisting of seven rigid bodies –, each participant walked continuously in the CAREN system for 250 m. Three-dimensional data from the markers were collected and analyzed for both marker sets separately. Joint kinematics were calculated from the HMS using Visual 3D, and from the CMS using a custom written Matlab program. We analyzed data from ten consecutive steps starting at the fiftieth step to allow participants to acclimatize to the treadmill. Joint kinematic time series were averaged for visual inspection and for quantifying differences between marker sets. Four different bins, spanning 20% of the average step duration (ASD), were defined, representing the four different points in the step cycle to be analyzed: heel-strike (0±10%ASD), mid-stance (30±10%ASD), take-off (60±10%ASD) and mid-swing (80±10%ASD). Statistical comparisons were made for averaged joint kinematics within these bins.

Results: We compared joint kinematic data across multiple steps as measured with both marker sets. Differences between both sets were found to be small and contained within normal gait variation limits (±5%) for all relevant joints (hip, knee and ankle) in the sagittal plane. Although differences were not that small in the transverse and frontal planes, they were still within normal gait variation limits.

Conclusion: The results from this study suggest a novel, clinically usable simplified marker set and gait analysis protocol for the CAREN system. It will not require specialized expertise in anatomical marker placement and yet provide reliable kinematics data to be used during assessment and rehabilitation sessions on the CAREN.

P117: Psychosocial Screening of Low Back Pain Patients at Canadian Forces Health Services Center (Atlantic): A Pilot Initiative

*Glover, S., MSc; Trudel, R. Maj., MSc; Besemann, M., LCol., MD

Department of National Defence

Brief Description: A low back pain (LBP) clinical pathway is being developed within the Canadian Armed Forces (CAF) to standardize healthcare delivery to CAF members seeking care for LBP through Canadian Forces Health Services. The pathway guidelines will include screening patients for psychosocial barriers to recovery. The STarT Back Tool and the Orebro Musculoskeletal Pain Screening Questionnaire are two of the most widely used psychosocial screening instruments. Many clinical 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. In order to implement this screening process 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 initiative will test the screening process at one Canadian military base to assess potential barriers and facilitators to widespread implementation.

The purpose of this pilot initiative is: (1) To assess the feasibility of screening patients in order to identify psychosocial barriers to good outcome in a physiotherapy clinic setting; (2) To explore the predictive accuracy of the STarT Back and the Orebro in a military healthcare setting.

Clinical Outcomes: Objective 1. (a) % LBP patients with initial screening data collected: % LBP patients presenting to physiotherapy; (b) % of LBP patients with completed follow up at 30 days, 3 months and at discharge; (c) Physiotherapy staff feedback on barriers and facilitators to screening patients

Objective 2. (a) Functional disability (Roland Morris Questionnaire); (b) Pain score; (c) Health services utilization (re-referral to physiotherapy after completed discharge); (d) Duty status at 6 months and 1 year.

Patient Population: CAF members with LBP presenting for physiotherapy care at Canadian Forces Health Services Center (Atlantic)

Conclusions: The initial trial of the screening process for psychosocial barriers to recovery is feasible when applied in a standardized manner. The comparison of the STarT Back Tool and the Orebro Musculoskeletal Pain Screening Questionnaire in a military sample at Canadian Forces Health Services Center (Atlantic) shows a strong correlation with one another, similar to the general population. With regards to the outcomes of disability, pain, re-referral to physiotherapy, and duty status, it appears to be relevant to screen LBP patients presenting for care in this population.

P118: The Use of The Patient Specific Functional Scale (PSFS) Within Canadian Forces Health Services Centre (Atlantic) Physiotherapy Back Class: A Clinical Review

*Bowes, M., BSc; *Glover, S., MSc; Godsell, P., Capt., BSc; *Trudel, R., Maj., MSc

Department of National Defence

Brief Description: Increasing emphasis is being placed on patient-centered care and collaborative goal setting in treating patients with low back pain (1). The Patient Specific Functional Scale (PSFS) is a therapeutic outcome tool which measures functional change over time in activities rated as important by patients themselves. The minimal clinically importance difference (MCID) for the PSFS is two points (2). The primary objective of this review is to determine if the PSFS demonstrates a clinically important change in military patients with back pain participating in a longitudinal group exercise intervention. In turn this clinical review may validate this tool's use in preparing Canadian Armed Forces (CAF) members for return to full military duty after back injury.

Clinical Outcomes: Following assessment by their physiotherapist, patients are deemed eligible to participate in the back class if they have had chronic low back pain (defined as persisting for at least 3 months) and are able to participate and complete the entire course duration. Patients are excluded if they have signs or symptoms of radiculopathy (distal to the knee) or a straight leg raise less than 40 degrees. The class is run by two physiotherapists and is given twice a week for a total of six week duration. It includes a practical education session and an exercise session focused on core and normal functional movement patterns. Patients are asked to record PSFS for three outcome goals prior to and upon completion of the class on a scale of 1-10. Clinical analysis will be performed on participants from September 2015 to September 2016.

Patient Population: Serving military patients with back pain participating in a longitudinal group exercise intervention.

Conclusion: At of the time of interim April 2016 analysis, 70 patients had participated in the class. 48 patients completed at least two pre- and post-intervention PSFS measurements; 38 patients had all three PSFS scores recorded pre- and post-intervention. At baseline, the median PSFS score was 3.5 (mean 3.6 +- SD 2.16). Upon completion, the

median PSFS score was 6.8 (mean 6.2 +- 2.2). The median change per PSFS measured was 2.5 (mean 2.6 +- SD 2.1), meeting the MCID. 15 of 38 patients saw improvement in all three sets of pre- and post-intervention PSFS measurements.

The use of patient centered outcome measures is an important part of physiotherapy practice. The PSFS may demonstrate a clinically important change in a military population. Support for the use of this therapeutic tool to prepare CAF members for return to full military duty after back injury will be established.

P119: Canadian Armed Forces Physical Rehabilitation Program: A 2016 Canadian Forces Health Services Centre (Atlantic) Clinical Review

*Godsell, P., Capt., BSc; Trudel, R., Maj., MSc; Besemann, M., LCol., MD

Department of National Defence

Brief Description: The Canadian Armed Forces (CAF) strives to be responsive to the evolving needs of their members. Canadian Forces Health Services (CFHS) is therefore continually revitalizing the Physical Rehabilitation Program in order to meet the changing needs of military personnel in an effort to facilitate, whenever possible, the re-integration of CAF members to full duties. Although the program itself has been up and running since 2008, ongoing enhancements are being put into place on a regular basis.

The Survey of Transition to Civilian Life (STCL) reported that 95% of CAF veterans releasing from 1998 to 2007 diagnosed with mental health conditions had concurrent physical health conditions, while 28% of clients diagnosed with physical health conditions had concurrent mental health conditions. These findings highlight the importance of reviewing physical rehabilitation practices offered to CAF members at Canadian Forces Health Services Centre (Atlantic) while exploring inter-professional practices to achieve improved patient-centered care, more specifically in the areas of: (1) Internal Occupational Therapy Services; (2) Return-to-Fitness and/or Duty Initiatives; (3) Mild Traumatic Brain Injury / Concussion Management; and (4) Chronic Pain Management.

Clinical Outcomes: The changes to physical rehabilitation services offered and referrals to newly introduced treatment and management options available to CAF members served by Canadian Forces Health Services Centre (Atlantic) physical rehabilitation will be tracked and reported on. Return-to-Duty being the ideal outcome measured and reviewed.

Patient Population: Ill and injured CAF military personnel served by Canadian Forces Health Services Centre (Atlantic) physical rehabilitation services.

Conclusion: The clinical review of enhanced physical rehabilitation services provided by Canadian Forces Health Services Centre (Atlantic) will help maximize function and clinical outcomes for ill and injured CAF personnel. The quantified data could then be applied to other military base populations with similar clinical profiles and duty requirements. In turn, sustainable and equitable care for all CAF members, through strategic oversight and quality control, may be achieved.

P120: Pillars to the Canadian Armed Forces Physical Rehabilitation Program High-Performance Framework

*Godsell, P., Capt., BSc; Besemann, M., LCol., MD

Department of National Defence

Brief Description: Canadian Armed Forces (CAF) members who sustain traumatic injuries expect the same intensity of their recovery and rehabilitation as they apply to their military training. The CAF Physical Rehabilitation Program was established in 2008 and is based on the World Health Organization framework for health and disability, the International Classification of Functioning, Disability and Health. The CAF developed a hybrid civilian-military rehabilitation team to foster a challenging rehabilitation environment to meet high-performance fitness and return-to-work objectives.

Every day, CAF members sustain neuro-musculoskeletal injuries both at home and abroad that could potentially end their careers. Continued access to internal, well-structured and well-delivered physical rehabilitation programs is a key component to health protection and operational readiness. CAF members who sustain these traumatic physical injuries often demonstrate physical capabilities, high-level goals and aspirations beyond those commonly witnessed in a civilian population. This likely stems from skills acquired during basic training, annual fitness testing, operational requirements and a natural need to perform at a high level due to healthy peer pressure and camaraderie.

This poster will highlight the newly established CAF Physical Rehabilitation Program High-Performance framework. A framework consisting of four pillars, bound together by sustainability measures to achieve optimal re-integration of meaningful activity.

Clinical Outcomes: Canadian Forces Health Services institutional credibility has been achieved in physical rehabilitation through the many cross-pollination opportunities the CAF Physical Rehabilitation Program contributed to and learned from. This qualitative exploratory work provided insights into the best clinical and administrative practices. Findings have been trialed and evidence-based guidance documents drafted from this work.

Patient Population: Ill and injured CAF military personnel

Conclusion: Institutional credibility first and foremost stems from CAF members themselves and their clinicians; a team which works tirelessly together in order to achieve re-integration of meaningful activity. The insights gained through this qualitative work helps maximize function and clinical outcomes in injured CAF personnel and could be applied to select patients in civilian populations, with similar clinical profiles, and in other countries with similar demographics and resources.

P121: A Randomized Comparison between Neurostimulation and Ultrasound-guided Lateral Femoral Cutaneous Nerve Block

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Introduction: This prospective, randomized trial compared neurostimulation (NS)- and ultrasound (US)-guided lateral femoral cutaneous nerve (LFCN) block. We hypothesized that US would result in a shorter total anesthesia-related time (sum of performance and onset times). We also documented and qualified sensory distribution loss after the lateral femoral cutaneous nerve (LFCN) block. Based on the existing literature, we hypothesized that there would be clinically relevant intra and inter patient variability for this sensory nerve, but no

significant differences when comparing the two injection techniques.

Methodology: Twenty-one volunteers were enrolled. The right lower limb was randomized to an NS- or US-guided LFCN block. The alternate technique was employed for the left lower limb. With NS, paresthesias were sought in the lateral thigh at a stimulatory threshold ≤ 0.6 mA (pulse width = 0.3 ms; frequency = 2 Hz). With US, local anesthetic was deposited under the inguinal ligament, ventral to the iliopsoas muscle. In both groups, 5 mL of lidocaine 2% were used to anesthetize the nerve. During the performance of the block, the performance time and number of needle passes were recorded. Subsequently, a blinded observer assessed sensory block in the lateral thigh every minute until 20 minutes. Success was defined as loss of pinprick sensation at a point midway between the anterior superior iliac spine and the lateral knee line. Onset time was defined as the temporal interval required to achieve success. The blinded observer also evaluated the level of procedural pain. The blinded observer then assessed the degree of sensory loss anterio-medially, laterally and posteriorly and mapped this distribution onto the corresponding grid.

Results: Both modalities provided similar success rates (76.2%(NS)-95.2%(US)), performance times (162.1(US)-231.3(NS) seconds), onset times (300.0(NS)-307.5(US) seconds) and total anesthesia related-times (480.1(US)-554.0(NS) seconds). Procedural pain was also comparable between the 2 groups. However US required fewer needle passes (3.2 ± 2.9 vs.9.5 ± 12.2; P= 0.009). There was no statistical difference from a surface area sensory distribution standpoint when comparing US to NS. There was expected variability for the sensory distributions for this nerve when comparing a single patient side to side and between patients. The most common area of sensory loss on the thigh occurred in the central lateral two eighths anteriorly, the central anterio-inferior three eighths laterally, with extension to posterior mid and medial thigh in select cases.

Conclusion: Ultrasound guidance and NS result in similar success rates and total anesthesia-related times for LFCN block, with wide inter and intra sensory distribution variability.

P122: Tinnitus Management in the Canadian Armed Forces: A Potential Role for Occupational Therapists

*Jones, C., MSc

Department of National Defence

Brief Description: Tinnitus is defined as auditory perceptions of sound in the absence of external acoustic stimulation. Canadian Armed Forces (CAF) members experience tinnitus, at an elevated prevalence when compared to the general population. Tinnitus and hearing related claims are the most common disability addressed by Veterans Affairs Canada. Tinnitus can be caused or exacerbated by stress, noise-related trauma, mental health conditions, (i.e. depression and anxiety), and other conditions or circumstance; many of which CAF members already experience at a higher rate than their civilian counterparts. Tinnitus can have a profound effect on a person's functioning; disruption in sleep, cognition, socialization, affect, etc. can reduce a soldier's ability to participate in activities of daily living which include military tasks. Evidence-based literature surrounding best practice for the tinnitus management has developed rapidly in past years. Managing tinnitus involves minimizing the resulting stress it can cause and maintaining or increasing day-to-day functioning despite its presence. Management may include cognitive behavioral therapy, mindfulness, sound therapy, reassurance, education, etc.

Research regarding tinnitus management, therapy, prevention, and rehabilitation with CAF members is limited. Currently within Canadian Forces Health Services (CFHS), a formal protocol or intervention pathway to address the management of tinnitus does not exist.

Occupational therapists (OTs) may be best fit to address tinnitus management within CFHS. The frameworks and models utilized by OTs allow them to holistically address soldiers as part of the multidisciplinary team. OTs possess a unique and pragmatic skill set that allows them to effectively unite physical, mental, and cognitive health with evidence-based assessment and intervention.

The purpose of this presentation is to: 1) discuss tinnitus as a barrier to participation in CAF members, 2) present how OTs could address this, and 3) discuss the utilization of outcome measures assessing the disability caused by tinnitus in CAF members referred to OT.

Clinical Outcomes: Members with tinnitus have been referred and assessed by the CAF-OT at Canadian Forces Base (CFB) Edmonton. Standardized, evidence-based outcome measures were utilized to record the member's perceived levels of disability due to tinnitus. Those assessed scored in the moderate to catastrophic handicap/disability range on initial assessments. Education, reassurance, mindfulness instruction, and coping strategies were offered to these members by the CAF-OT.

Patient Population: CAF members at CFB Edmonton experiencing tinnitus.

Conclusion: A standardized intervention process for tinnitus management is a gap in health services that could be addressed by OTs. Future research on the effectiveness of tinnitus management interventions in the CAF population may be beneficial.

P123: Influencers of Tobacco Use in Military Personnel: Trends and Variations Observed in Different Environments - InTUiTiVE

*Lui, K., Capt, BSc; Tuff, R., Lt(N), BPharm; Powell, W., Capt, BSc; Harland, C., Capt, BSP; Henderson, K., Capt, BSc; Ma, J., PharmD

Department of National Defence

Introduction: Although it is evident that smoking is detrimental to health, it remains prevalent in the CAF. 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. This project aims to compare and contrast tobacco usage and associated beliefs about smoking cessation medications (SCMs) amongst military members employed in different operational settings.

Methodology: In the first phase of this study, an anonymous survey will inquire about participants' use of tobacco during their employment at current base and their views on SCMs. The questionnaire will be offered on a voluntary basis to personnel departing from Air Force (CFB Winnipeg, Trenton, and Cold Lake) and Navy (CFB Halifax) bases between June and August of 2016. This will be incorporated into existing administrative procedures, and will available in English and French to maximize participation. Both versions were pilot tested and content validity assessed.

This same survey was applied to personnel departing from Army bases between June and August of 2015 in a previous study (FITCAP – Fac-

tors Influencing Tobacco Use in Canadian Army Personnel). In order to facilitate comparison, timelines and survey methodology in this study will be identical to FITCAP. The second phase of this study will pool data from the first phase with the data from FITCAP. Comparative and descriptive statistical analysis will be done using SPSS.

Results: Analogous to the timeline used for FITCAP, we intend to harvest data and analyze data in September 2016 and have final results available for the first week of October of 2016.

Conclusion: Previous application of this survey on Army bases identified 'occasional smokers' as those at risk of increasing tobacco use during their posting. Comparison of data across different bases may identify opportunities to tailor smoking cessation interventions for each type of base, to promote further reductions in tobacco use.

P124: Assessment of Smoking Cessation and Tobacco Use in Theatre amongst Canadian Forces Personnel (ASTUTE)

*Lui, K., Capt, BSc; Henderson, K., Capt, BSc; Ma, J., PharmD

Department of National Defence

Introduction: Our organization currently promotes tobacco abstinence by offering on-site psychosocial support and a range of related drug benefits, but continues to see high rates of tobacco use in employee subsets. Anecdotally, the different operational environments have specific factors that promote or hinder tobacco consumption. Observational studies have associated deployment with increased risk of tobacco use. However, the specific contributions of factors associated with deployments on tobacco use behaviour are not yet known. This project aims to investigate tobacco usage and associated beliefs about smoking cessation medications (SCMs) among soldiers returning from deployment.

Methodology: An anonymous survey inquired about participants' use of tobacco during their deployment in Kuwait and their views on SCMs. The questionnaire was offered on a voluntary basis to personnel returning from deployment to Canadian Forces Base Cold Lake between March and April 2016. It was incorporated into existing administrative procedures to maximize participation. Descriptive statistics and thematic analysis will be performed on data collected.

Results: At this point, 18 completed surveys have been returned and we expect this number to increase. Analysis will be conducted in August 2016 and final results will be available September 2016.

Conclusion: Possible associations between operational deployment and changes in tobacco use behaviour have been suggested. However, specific factors which contribute to changes in tobacco use and beliefs towards SCMs amongst deployed personnel have not yet been elucidated. Results of this study are anticipated to aid in informing development of specific interventions to reduce risk of escalation in tobacco use on deployed operations.

P125: The Chronic Pain Self-Management Program at Canadian Forces Health Services Centre (Atlantic): Physiotherapy's Role.

*MacIntyre, K., BSc; Robinson, H., BN; Godsell, P., Capt., BSc; Trudel, R., Maj., MSc

Department of National Defence

Brief Description: Definitions of what constitutes chronic pain vary widely. Pain symptoms that persist for greater than three months are usually referred to as chronic by the International Association for the Study of Pain (IASP.) This is largely predicated on the fact that most tissue damage is expected to have healed by 3 months, although this is not always the case. Tissue damage may not even be necessary for pain to be present. Persistent symptoms may significantly impact physical, psychological and social well-being.

Within Canadian Armed Forces (CAF) veterans releasing between 1998 and 2007 the Survey of Transition to Civilian Life (STCL) found that chronic pain or discomfort was reported by 68% of respondents and that the prevalence of chronic Low Back Pain was 40% compared to the national average of 21%, adjusted for age and sex. The prevalence of Arthritis (most commonly osteoarthritis or mechanical wear and tear of the joints) was 23% versus 11%. Overall it would appear, based on these numbers, that chronic pain affects veteran military population at twice the rate of matched civilian cohorts. These findings highlight the importance of addressing chronic pain in the CAF population. This poster will aim to review the components of the 4 week multidisciplinary chronic pain self-management program offered to active serving members at Canadian Forces Health Services Centre (Atlantic), more specifically, the physiotherapist's role in the program and clinical outcomes of the program.

Clinical Outcomes: (1) The Pain Outcomes Questionnaire (POQ); (2) The Pain Stages of Change Questionnaire (PSOCQ); (3) The Tampa Scale of Kinesiophobia (TSK); (4) Functional testing: 1 min sit-to-stand, 1 min stair climb test, raised arm endurance, sit and reach test.

Patient Population: Ill and injured CAF military personnel with pain symptoms that persist for greater than three months served by Canadian Forces Health Services Centre (Atlantic).

Conclusion: The Chronic Pain Self-Management program at Canadian Forces Health Services Centre (Atlantic) exemplifies the 2004 Canadian Forces Medical Clinic Model which states "the goal of Collaborative Practice is to successfully integrate the skills and knowledge of health care providers from different disciplines to optimize patient care". Through multidisciplinary collaborations and education this bio-psychosocially founded program helps CAF members to feel more in control and increases their readiness to adopt a self-management approach to their condition.

P126: Canadian Armed Forces Physical Rehabilitation Program: A Quality Assurance Review for Serving Members and Veterans with Amputations

*Mahoney, N.A., Capt, BSc; Besemann, M., LCol, MD

Department of National Defence

Brief Description: Since the Canadian Armed Forces (CAF) Physical Rehabilitation Program was established in 2008, the nature and complexity of injuries and illnesses sustained at home and abroad are changing as are the technologies and treatments to address these. As a result, the Canadian Forces Health Services (CFHS) is constantly revising the Rehabilitation Program's policies and guidance in order to support the Rehabilitation and Re-Integration pillars of the Chief of Military Personnel's (CMP) strategic vision. The delivery of state of the art physical rehabilitation to our serving members depends largely on the collaboration established with our civilian partners. Injured members expect to be rehabilitated with the same intensity and challenges with which they were initially trained.

An inter-professional team approach including the injured member at the center of the team is the foundation upon which the CAF rehabilitation program is based. As the main consumers of rehabilitation technology and services, injured CAF members' opinion of the delivery of care is critically important for program advancement and Continuous Quality Improvement (CQI). Issues such as access to care, prosthetic procurement and advanced gait training are essential to providing an optimal rehabilitation experience. As part of the Physical Rehabilitation Program's quality assurance, patient experience surveys were distributed to all currently serving CAF members with amputation(s). Results of the survey will be presented as well as how these influence policy and guidance updates and refinement.

Clinical Outcomes: The CAF Health Services Physical Rehabilitation Services Patient Experience Survey will be tracked and reported on. Key lessons learned will be summarized and resulting policy changes described.

Patient Population: CAF serving members and veterans with amputations and other major physical trauma who received inpatient care at a civilian rehabilitation facility and who were later transferred for outpatient care to a CAF medical clinic for ongoing care.

Conclusion: Clinical programs exist to serve unique populations in an evidence based, effective and efficient manner. The CAF Physical Rehabilitation program strives to achieve its aim by incorporating end-user feedback into policy and program updates. Given the ever-changing landscape in regards to prosthetic technologies and rehabilitation practice, it is critical that patient feedback be incorporated whenever possible into the quality improvement continuum. The CAF Rehabilitation program is welcoming of feedback from CAF members to achieve the aim of reaching optimal potential following illness or injury and averting unnecessary stressors which may arise during this process, whenever possible.

P127A: Examples of Casualty Analyses Highlighting the Need for a Standardization of the Operational Injury Data Collection

*Martineau, L., PhD

Department of National Defence

Introduction: The classified CASPEAN (Casualty And Protective Equipment Analysis) database consolidates and links together multiple aspects of attacks on Canadian Armed Forces (CAF) warfighters, namely, the scenario and threat involved, the physical injuries that were sustained as well as the nature of damage to structures, military vehicles and Personnel Protection Equipment. The limited post-incident casualty analyses that we performed during Op ATHENA, solely based on KIA (killed in action) injury data, have influenced equipment acquisition, design and testing as well as some Tactics, Training and Procedures. We recently initiated the exploitation of the full CASPEAN database to provide evidence-based direction to several Land Systems acquisition projects. Unfortunately, the wounded in action (WIA) injury records often lack the level of detail required to properly analyze the data. We discuss the results of four unclassified casualty analyses based on partial injury data sets, and explain how to easily improve the description of operational injuries in future operations to fully benefit from exploiting the CASPEAN data.

Methodology: The casualty analyses performed were prioritized to support the procurement of specific Land Systems. Thus, we queried the database to identify gaps in: soft tissue and penetrating injuries,

concussions, burn injuries and spinal fractures. Five types of deficiencies were found: WIA without CASPEAN injury records (WIAno), injury type NFS (Not Further Specified), anatomical location injured NFS, injury severity NFS, and injury mechanism NFS. The Canadian Forces health information system (CFHIS) was consulted to optimize these incomplete injury records as well as validate those believed to be comprehensive for the remainder of CASPEAN WIA.

Results: The CFHIS contained few injury records for WIAno. Similarly, there was limited information on the anatomical location of soft tissue/penetrating injuries and burns. In contrast, we catalogued several new records of concussions along with concomitant injuries previously unidentified, allowing us to assess their mechanism. While we determined the anatomical location of most spinal fractures NFS, their injury mechanism still remains uncertain as the descriptors required for optimizing their characterization were missing. Interestingly, many incomplete injury data sets were collected before the Biosciences Liaison Officers began to support exclusively the operational injury data collection.

Conclusion: Considering that we cannot further enhance the current CASPEAN injury records, our rigorous casualty analyses will be occasionally tempered with several caveats and limitations. Standardization of the various injury descriptors gathered during future large-scale military operations is essential for enabling the identification of capability gaps in protection and maximizing the lessons learned.

P127B: Key Role of the Bioscience Liaison Officer in the Collection of CAPSAC Data in Future Theaters of Operations

*Martineau, L., PhD; *Poirier,T.J.M., Capt, BSc

Department of National Defence

Introduction: Several Canadian Armed Forces (CAF) personnel were injured during Op ATHENA. However, our ability to conduct thorough gap analyses of the performance of vehicle and personnel protective systems was hindered by the paucity of links between the chains of events leading to these casualties. Thus, we established CAPSAC (Casualty and Protective System Analysis Capability) as a systematic approach for collecting operational data, integrating it in the CASPEAN (Casualty And Protective Systems Analysis) database, and carrying out rigorous scientific analyses to support Land systems acquisition projects. The Bioscience Liaison Officers' (Bio LO) human sciences backgrounds uniquely positioned them to collect data on injury patterns and Personal Protective Equipment (PPE) performance. However, our recent exploitation of the database has revealed several gaps in the CASPEAN data records. We describe the roles and responsibilities that the Bio LO should adopt in future deployments to optimize the CAPSAC operational data collection.

Methodology: We queried the database and identified three types of incomplete records: injury (e.g., confirmed wounded in action casualties (WIA) without injury records; insufficient level of information to properly code the injury severity); extracted wound fragments (e.g., number, characteristics, wound path); and, status of CAF personnel in the database (e.g., WIA, uninjured soldiers with damaged PPE). The CAF health information system was then consulted to optimize the injury records. Based on the deficiencies that we identified, we developed a set of roles and responsibilities to ensure that operational data collection is optimized in future large-scale operations. Former Bio LOs and Canadian Forces Health Services Group's (CF H Svcs Gp) stakeholders validated these tasks for their relevance to the operational setting.

Results: Bio LOs should attend pre-deployment information sessions to gain perspective on/ familiarize themselves with the standardized tools/report formats required to best capture data. They should liaise with the deployed medical personnel to: prepare comprehensive injury mappings; record all injuries and their mechanisms; obtain surgically-recovered fragments; and, characterize wound paths. Maintaining links with other deployed CAF personnel is essential to identify WIAs, recover all damaged PPE (especially if there were no injuries) and obtain detailed contextual data. Awareness must be raised to collect data after evacuating casualties from theater. Reach-back data validation with the DRDC CAPSAC Injury Subject Matter Expert is crucial.

Conclusion: The proposed procedures ensure that the Bio LOs collect comprehensive and high quality data in theater. CF H Svcs Gp should formalize them to enable us to identify capability gaps in protection and provide appropriate evidence-based direction to Land Systems acquisition projects.

P128: A Knowledge Translation Intervention Implementation Strategy to Promote Evidence Based Management of Lateral Ankle Sprains by Canadian Armed Forces Physiotherapists

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Introduction: Lateral Ankle Sprains (LAS) are the 3rd most common musculoskeletal injury among military members, resulting in considerable time loss and a substantial rehabilitation workload. The operational relevance of these consequences to the Canadian Armed Forces (CAF) should be minimized through the use of evidence based practices. A previous survey of CAF Physiotherapists indicated a 'knowledge to practice gap' in their LAS management practices, including reporting of delayed prescriptions of rehabilitation interventions and limited outcome measures. A follow-up focus group reported their preferred knowledge translation strategies and specific implementation facilitators/barriers perceived to influence their integration of research knowledge into their clinical practice. The purpose of this research project is to use a comprehensive implementation strategy that applies evidence based knowledge translation interventions tailored to the preferences and implementation facilitators/barriers reported by CAF Physiotherapists, to improve their knowledge of and use of the rehabilitation interventions and outcome measures recommended in the management of LAS.

Methodology: All CAF Physiotherapists practicing in CAF Health Services Centres across Canada (n=~90) will be sent an email invitation to voluntarily participate in this study. Using the Knowledge-to-Action Action Cycle theoretical framework, a comprehensive, active, multi-component intervention including summarized research knowledge, point-of-care practice tools and guided interactive discussion will be delivered to CAF Physiotherapists using an electronic distance learning platform. The primary outcome for this project will be the mean change reported by CAF Physiotherapists on a modified self-reported questionnaire investigating their knowledge and use of rehabilitation interventions and outcome measures in their management of LAS between baseline, 3 and 6 months.

Results: This project is currently a work in progress, recruiting participants until summer 2016, and collecting data from fall 2016 to spring 2017.

Conclusion: As current best research evidence recommends the use of tailored knowledge translation interventions directed towards known facilitators/barriers, it is hypothesized that this implementation strategy will be an effective means of improving the evidence based practices of CAF Physiotherapists in their management of LAS. If so, this framework may be considered to promote and measure their uptake & utilization of research evidence into clinical practice for other musculoskeletal injuries. Furthermore, as CAF Health Services evolves towards all allied health professionals using electronic documentation, these rehabilitation interventions and outcome measures may be operationalized to facilitate aggregate data collection, and thereby may be used to evaluate patient outcomes, treatment efficacy and cost effectiveness.

P129: Evaluation of the Effectiveness of Extracorporeal Shockwave Therapy at Improving Pain and Function in Chronic Tendinopathies of the Extremities within the Canadian Armed Forces: A Clinical Trial

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Department of National Defence

Introduction: Extracorporeal shockwave therapy (ESWT) is a non-invasive modality for the treatment of chronic tendinopathies, without the risks and possible complications inherent with surgery. It is primarily used in the treatment of overuse tendinopathies such as plantar fasciitis, achilles tendinopathy, lateral epicondalgia of the elbow, calcific or non-calcific tendonitis of the shoulder, and patellar tendinopathies. It is most effective for chronic conditions that are resistant to conservative management, where corticosteroid injections and/or surgery are being considered. According to the current literature, the success rate of ESWT varies but is fairly good, and the reported complications are low and/or negligible. However, ESWT is not covered within the Spectrum of Care (SoC) at this time, and the referral process varies by location. A clinical trial is currently being conducted at three major Health Services Centres in order to: 1) evaluate the effectiveness of ESWT in a CAF population; 2) determine the ideal type of ESWT (focused vs. radial); and 3) establish a CFHS-wide treatment protocol and referral process.

Methodology: Extracorporeal shockwave therapy will be applied by a physiotherapist to CAF personnel with chronic tendinopathies of the extremities (plantar fasciitis, Achilles or patellar tendinopathy, lateral epicondalgia, and rotator cuff tendinopathy). Symptoms must have persisted beyond three months and be unresponsive to conservative management. The initial course of treatment will consist of three sessions over three weeks, with a further two sessions to be completed if required.

Results: Pain and function will be assessed using clinically valid outcome measures at baseline, mid-treatment, and at the end of treatment, with follow-up to be conducted at six and 12 months post treatment. The Foot and Ankle Disability Index (FADI) will be used for plantar fasciitis and Achilles tendinopathy; the Lower/Upper Extremity Function Scale (LEFS/UEFS) for patellar tendinopathy and lateral epicondalgia, respectively; and the Disabilities of the Arm and Hand (DASH) questionnaire for rotator cuff tendinopathy. In addition, all patients will complete the Patient Specific Function Scale (PSFS). Differences between the effectiveness of focused and radial ESWT will also be assessed, in order to determine which type of device would best serve the requirements of a CAF population.

Conclusion: The clinical trial began March 2016 at Canadian Forces Health Services Centres in Edmonton, Ottawa and Halifax. Preliminary

conclusions are expected to be drawn by September 2016.

P130: Cigarette Smoking in the Regular Forces

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Department of National Defence

Introduction: Cigarette smoking is the single leading cause of preventable death in the world. Nearly half of persistent cigarette smokers will die prematurely due to their nicotine addiction, if they are unable to quit. Furthermore, cigarette smoking is associated with significant morbidity. The Canadian Armed Forces (CAF) have a vested interest, both short and long-term, to help personnel quit smoking, and to prevent smoking initiation among non-smoking members.

Methodology: Data from the Health and Lifestyle Information Survey (HLIS) – a comprehensive population-based survey of CAF personnel – were used to estimate the prevalence of current and lifetime cigarette smoking among Regular Force members. The HLIS was a paper questionnaire that collected information from a random sample of 4,314 Regular Force personnel, of which 2,499 responded from October 2013 to September 2014.

Results: 60% of all Regular Force personnel had never smoked at least 100 cigarettes in their life. Another 4% had once been smokers, but had quit before enrolling and had never smoked while serving in the CAF. 14% were smokers at the time of their enrollment, but had since quit. An additional 5% had never smoked before enrolling, and reported both starting and quitting smoking while serving in the CAF. The remaining 17% of personnel were current cigarette smokers. One-fifth of all current smokers only started smoking after joining the CAF. Therefore, approximately 1,800 current Regular Force smokers had never smoked before joining the CAF. Basic and occupational training were often cited as circumstances during which lifetime non-smokers first started smoking. Without any further smoking cessation, we estimate that nearly 5,000 current Regular Force personnel will die prematurely due to persistent cigarette smoking, and that approximately 900 of these early deaths will be in individuals who started smoking while serving in the CAF.

Conclusion: The numbers presented above are the most up-to-date estimates of cigarette smoking prevalence in the Regular Force. They provide useful benchmarking figures for policy planning and population health surveillance efforts. They also highlight the potential impact of prevention initiatives targeting smoking initiation in Regular Force personnel, especially during basic and occupational training; such initiatives could prevent hundreds of early deaths among the men and women who proudly serve our country.

Social Health and Wellbeing

Podium Presentations

1B04: Military Families and Access to Health Care: A Scoping Review

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Queen's University

Introduction: Military families are growing and are representing a larger proportion of the population generally, necessitating increased attention to the unique healthcare and system access needs of military families. The military lifestyle varies considerably from that of the civilian sector. It is shaped by mobility, separation, and increased risk. Active Canadian military personnel receive health care services from the federal government, while their families must obtain services from the civilian sector. Their access to appropriate medical services and continuous health care is compromised by deployment and frequent relocations. These interruptions can have a negative impact on the family's mental and physical health and wellbeing. The purpose of this study was to explore health system navigation and access needs and challenges experienced among military families.

Methodology: Using Arksey and O'Malley's 5-step structured approach, a scoping review was performed to identify, select, and analyze relevant studies. A database search was conducted through CINAHL, Cochrane, EMBASE, ERIC, Exceptional Parent, and MEDLINE. After exclusion, sources were reviewed in full and the extracted data was coded using NVivo software. Findings were analyzed and developed into themes.

Results: A total of 441 sources published between 1990-2015 were identified, with 34 proceeding to full analytic data extraction. The majority of sources explored challenges faced by American military families in accessing health care and discussing approaches that may improve access. Overall, it was found that access to health care is hindered by geographic moves, deployment, and ignorance of military-specific needs in the civilian health system. American Reservist and National Guard families face additional challenges compared to other service members in the U.S. related to the healthcare system structure and access pathways.

Conclusion: Research conducted in the U.S. indicates that military families have unique health needs related to military life. However, despite a shift to civilian services, the civilian sector is fairly unaware of those needs, often not identifying clients as military-connected. This current state of awareness and associated competencies, combined with more logistical barriers related to geographic moves and branches of the military, leads to military families facing challenges in accessing the health care they require.

2B03: The Well-being of UK Military Spouses during Military Relocation: Influences on Identity, Agency and Connectedness

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Introduction: Social networks, relationship quality and employment can all improve well-being, a key component of health. Yet the frequent relocations women married to Service personnel experience as personnel are assigned to new postings can hamper the positive benefits these factors bestow. This paper aims to explore how the well-being of women with children who are married to UK Service personnel is influenced by their experiences of employment, family and social networks during military relocations.

Methodology: Individual semi-structured telephone interviews were conducted with 19 women married to current or former members of the UK Armed Forces. Qualitative data was analysed using Framework, an analytical method that uses matrices and summaries to improve the transparency and robustness of data analysis.

Results: The well-being of women married to Service personnel was influenced by the competing demands of different role identities. Bal-

ancing employment against being a mother and the 'wife of' a member of the Armed Forces created tension in some cases helped women construct an independent identity outside of these prescribed roles. Relocation challenged the ability of women to perform ascribed family roles as mothers and daughters or siblings successfully, leading to concerns about being a "good mother" and giving rise to feelings of disconnection from family networks.

Sacrifices to personal agency made in deference to the structure and processes of the military during relocations influenced well-being through restrictions to choice or control not only regarding employment but also daily life. These restrictions led to feelings of resentment towards the military institution yet the community created by the military was also a source of great support and understanding for women. A complex relationship arose between women and the military. On one hand, women resisted military control of their lives yet they welcomed the connectedness generated by the community that the military helped construct and maintain, a community that was perceived to not be as strong in civilian neighbourhoods.

Conclusion: The challenges to identity, agency and connectedness during military relocations pose difficulties for the well-being of women married to Service personnel. Where challenges are difficult to overcome, there may be implications for their mental health and additionally for personnel retention and recruitment. Proposed changes to UK military housing policy will increase the number of families living off-base, and while this may improve employment outcomes, it may also lead to an increase in perceived disconnection among military spouses living in civilian communities with a decreased understanding of military life.

2B04: Communication and Emotion Management among Military Families Separated during Deployments

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Introduction: Communications technology has been developing rapidly, increasing the number of digital and mobile options available for public use. These technologies are often seen as a panacea for the problems that families face when they must be apart, as is the case for military families during deployment. However, an emphasis on technology can shift the analysis of families' experiences of deployment toward questions of access to the exclusion of understanding the processes of emotion management that families must employ in order to effectively cope. In the research presented, I parse out the effects of particular communications technologies, as well as communications frequency, in the context of how technologies are incorporated into broader strategies of emotion management, including efforts to minimize anger, control fear, and create the "right" kind of presence in conversation in order to promote feelings of connectedness.

Methodology: Qualitative ethnographic interviews were conducted with 48 military service personnel, civilian spouses, and service providers who work professionally with military families (e.g., social workers, counselors, chaplains).

Results: Military service personnel and their spouses employ a number of emotion management strategies to respond to deployments, including consciously avoiding conflict; self-talk and mobilizing social supports to handle anger and fear; compartmentalization; and reinforcing talk aimed at producing a sense of love and connectedness during direct communication. Different technologies serve different purposes with regard to emotion management and the feelings of connectedness that families can enable. As well, the frequency with which military members are able to communicate with families affects the way in which individuals manage their emotions. For example, families who received little communication during deployments engaged in more self-talk and support-network behaviors, while families who were in regular contact had to minimize the increased potential for conflict or boredom that resulted from "too much communication".

Conclusion: As mobile technologies become more ubiquitous, military families' expectations of routine access may increase. It is essential to understand that these technologies, in and of themselves, do not accomplish the emotion work families must undertake in order to cope well with separations. Rather, communications technologies must be viewed as enablers of the broader emotion management strategies that families employ in order to address their functional and emotional needs in the face of deployment separations.

3B04: Occupational Stress in CAF Single Parents: Impact on Child and Parent Well-Being and Child-Parent Relationships

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Introduction: Previous research has documented challenges related to parenting while in military service (Drummet & Coleman, 2003; Chawla & Solinas-Saunders, 2011) and, specifically, in the single-parent families (McLanahan & Sandefur, 2009). However, little is known about the impact of military service on well-being of single-parent military families and on child-parent relationships. While previous qualitative research indicates that many Canadian Armed Forces (CAF) single parents can effectively cope with the conflicting roles of service and parent (Skomorovsky & Bullock, 2016), there has been no quantitative research examining the well-being of single parents coping with occupational stress. In order to address this research gap, this study was conducted to examine the role of occupational stress in the parental and child well-being and child-parent relationships in the single-parent CAF families.

Methodology: Electronic surveys were administered to Regular Force CAF members who were single, divorced, separated, or widowed with children 19 years old or younger ($N = 520$). Of those who reported demographic characteristics, there were 289 (56.7%) male and 221 (42.5%) female; 229 (46.2%) Junior Non-Commissioned Members, 172 (34.7%) Senior Non-Commissioned Officers, 46 (9.9%) Junior Officers, and 49 (9.4%) Senior Officers; 71 (13.7%) – Navy, 266 (51.2%) – Army, and 177 (34.4%) – Air Force personnel.

Results: Regression analyses were conducted to understand the role of occupational stress in parental distress, child well-being, and child-parent relationships. Occupational stress was found to be predictive of child and parent well-being and child-parent relationships. Additionally, while parental occupational stress predicted child well-being, child-parent relationships and parental well-being played more important roles explaining a greater proportion of variance in the child well-being.

Conclusion: This research suggests that occupational stress is not only an important predictor of parental well-being, but also plays a major role in the child well-being and child-parent relationships. However, the direct links of occupational stress to child well-being were reduced when child-parent relationship and parental well-be-

ing were considered. While parental occupational stress played an important role in child well-being, the relationships with the parent and parental well-being were more important predictors of the child well-being outcomes. Single CAF parents should be aware of the influence military life stressors have not only on themselves, but also on their child's well-being. Importantly, the negative impact of military life stressors on child well-being is reduced in part by parental well-being and positive parent-child relationships. Organizational implications of the findings and future research directions are discussed in the presentation.

3E02: Bounce Back® and Military Family Resource Centres Pilot Program – Increasing Access to Cognitive Behavioral Therapy Interventions for Military Families

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Brief Description: Though excellent mental health and social support services exist in many Canadian Armed Forces communities across Canada, there are inconsistencies in the level of support programs available to many military families, including those who do not live in close physical proximity to a Military Family Resource Centre (MFRC). Over the past year, the Canadian Mental Health Association, BC Division (CMHA BC) has worked with Military Family Services and local MFRCs to offer adult military family members access to Bounce Back®: Reclaim Your Health, an evidence-based mental health program delivered by CMHA BC. Funded by the BC Ministry of Health, Bounce Back® is proven to reduce depression and anxiety symptoms and improve quality of life for those with mild to moderate depression and anxiety of any severity level. The program intervention is comprised of a series of educational workbooks with telephone or video coaching to reinforce the application of cognitive-behavioral strategies for overcoming difficulties such as inactivity, unhelpful thinking, worry and avoidance.

The intervention has helped improve access to cognitive-behavioural interventions by being free to participants, available within 5 working days of referral and delivered via telephone or video-conferencing. This flexible delivery option is especially appealing for military families who live in remote or rural locations and who are experiencing initial signs of depression or anxiety. This presentation will provide participants with information on the pilot program approach and methodology, in addition to first-year results.

Clinical Outcomes: The Bounce Back® program uses the Patient Health Questionnaire, Generalized Anxiety Disorder 7-item scale, and The Quality of Life Enjoyment and Satisfaction Questionnaire as primary outcome measures.

Patient Population: The pilot population included adult members of military families in British Columbia who presented with low mood or mild to moderate depression with or without anxiety and were referred by a primary care physician.

Conclusion: The Bounce Back® program provides an evidence based approach that can support the recovery of adult military family members experiencing initial signs of depression or anxiety. Continued access to cost-effective, evidence-based psycho-educational programs such as Bounce Back® will prove to be instrumental in ensuring that military families in Canada have the sustained ability to deal with the unique stressors inherent with the military lifestyle.

4C01: Three Principles of Defence Ethics and the Military Ethos: Driving Culture Change in the CAF

Stephen Hare, PhD

Department of National Defence

Introduction: The Canadian Armed Forces (CAF) operates under two distinct but related core value/belief guidance documents, the *DND CF Code of Values and Ethics* and the CF Military Ethos articulated in *Duty with Honour: The Profession of Arms in Canada*. A series of CAF focus groups in 2015 suggest that there is poor awareness and comprehension of a core element of the Code of Ethics (the Three Principles). Critically, these Principles are also present, though sometimes very subtly, in the Ethos. I will argue that greater CAF awareness of and adherence to these Principles would likely have implications for the current CAF organizational culture and its approaches to member professional identity, development, well-being, and ethical initiative. These areas have been identified as ones where culture change is needed in militaries. The need for greater critical thinking at junior ranks (Horn and Bentley 2015), the need to clarify the dichotomy between obedience and moral initiative (CAF, Officership 2020), the need for greater moral sensitivity (Johnson 2012) and for closer concern to developing soldiers to prepare for the moral impact of operations upon them (Marlantes 2011) may all be supported by reinforcing the Principles.

Methodology: A series of 26 CAF focus groups were run in 2015 across Canada, in part to assess understanding of and engagement with these notions of military ethos and (defence) ethics. Participants were invited to judge their own readiness to explain or teach on *ethics* and *ethos.*

Results: Few respondents demonstrated basic familiarity with the Three Principles. Expressed confidence in the ability to explain the Ethos as a whole was also lower than confidence to talk about ethics in general. Doctrinally, the principles are all present with varying degrees of emphasis in the official articulation of the Military Ethos, and yet the foremost principle of Defence Ethics was generally least known to be an element of Ethos.

Conclusion: Based on empirical evidence that there is inadequate understanding and assimilation of the Three Principles in CAF circles, it can be expected that the *de facto* CAF organizational culture does not clearly enough reflect the application of these principles. Better application could have an eventual influence on areas such as strategies for personnel wellbeing via self- and peer-care, the importance of nurturing critical thinking and the acceptability of expressing doubt or disagreement to superiors in relation to moral autonomy and responsibility.

4C03: Problems of Sexual Violence in the Canadian Armed Forces: The Canadian Invasion of Germany in 1945 as an Historical Case Study

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Introduction: In 2015, issues of sexual violence in the Canadian Armed Forces (CAF) came to the forefront of the military's attention with the commencement of Operation Honour. The Operation Honour Op Order states, "harmful and inappropriate sexual behavior grievously erodes the confidence that members need to successfully carry out military duties… [it] is an operational readiness issue." Commanders

are now ordered to apply Operation Honour through discipline, doctrine, and policies. As an operational readiness issue, sexual violence is a challenge to the social health and well-being of serving personnel, veterans and their families. Understanding how past CAF leadership dealt with harmful and inappropriate sexual behavior may enable current CAF leadership to better conduct Operation Honour.

Methodology: Using newly uncovered historical courts martial files, this study is the first qualitative and quantitative engagement with the sexual harassment and sexual violence in the Canadian Army during the Second World War. At Forum 2015, we presented quantitative data from 50 courts martial for sexual harassment and sexual violence in 1945. At Forum 2016, we will present qualitative research from a sampling of the historical minutes of evidence from the courts martial files themselves. By examining the courts martial records, and qualitatively analyzing evidence such as witness testimony, cross-examination, summary statements, and statements from the accused, this presentation will explore the details of military discipline through a sustained army campaign to change soldiers' behaviour.

Results: Our study finds that a spike in the Courts Martial of Canadian soldiers for sexual violence represented an early disciplinary effort to correct soldiers' behavior and prevent fraternization with German civilians. By assessing the courts martial proceedings on sexual violence cases, our research provides a granular understanding of the CAF's disciplinary culture in 1945, the doctrines its commanders utilized in deciding whether or not to prosecute, and its policies regarding harmful and inappropriate sexual behavior.

Conclusion: During the Allied invasion of Germany in 1945, Canadian military authorities were confronted with evidence of extremely harmful sexual behaviour by their own troops against German civilians. The 1945 responses to sexual violence, rape, and harassment treated these issues primarily as operational ones. The CAF leadership of today can potentially use this historical example to inform policy on the implementation of Operation Honour.

5A04: Pathways to Positive Mental Health: A Comparison of Combat Exposed Canadian Armed Forces Reserve and Regular Force Members

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Introduction: Reservists represent one third of all Canadian Armed Forces (CAF) personnel and 20% of all CAF who were deployed on overseas operations. Many performed the same duties as Regular Force members, and were exposed to the same operational adversities. It has been posited that lesser access to military support systems and isolation contribute to more difficult post-deployment adjustment, resulting in a greater risk for developing mental health problems among Reservists. While research from the US and the UK has consistently pointed towards a higher risk of post-deployment psychopathology in Reservists, that pattern has not emerged in studies of CAF personnel. However, no studies have explored the relationship between another important dimension of well-being, namely that of positive mental health (PMH). Better understanding processes that may allow Reservists to maintain or improve PMH despite exposure to adversity may be of value. Three dimensions are believed to underlie PMH: happiness and life satisfaction (emotional well-being), positive individual functioning (psychological well-being), and societal functioning (social well-being). Factors such as organizational support

mechanisms, social support, and community belonging may protect and enhance PMH. A first aim of the present study is to examine differences in PMH between combat exposed Regular and Reserve Force members, while a second aim is to assess the role of organizational support mechanisms (i.e., mental health training), social support, and community belonging as pathways to PMH that may account for differences between Reservists and Regular Force members.

Methodology: To address the aims of this study, a path analysis will be conducted on data collected as part of the 2013 CAF Mental Health Survey. Participants will include 1,469 Reservists and the 3,384 Regular Force members who were deployed in support of the Afghanistan mission.

Results: It is expected that levels of mental health training, social support, and community belonging will be lower in Reservists compared to Regular Force members and, consequently, Reservists will report lower PMH than Regular Force members.

Conclusion: Results are expected to provide valuable insights for the development of interventions and programs aimed at improving the well-being of Reservists. In particular, these may help determine the value of exploring means to increase Reservists' contact with military personnel, structures, support services, and training and ultimately improve their PMH. Furthermore, these findings may point to fruitful directions for future research on the efficacy of different strategies aimed at addressing the issue of reduced accessibility among Reservists.

Poster Presentations

P131: Exploring Resilience in Military Family Health Research: A Scoping Review

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Introduction: In the National Defence and Canadian Forces Ombudsman's Special Report, *On the Homefront: Assessing the Well-being of Canada's Military Families in the New Millennium* (2013), it emphasizes sacrifices military families make to support the work done by members while highlighting the unique stressors of military family life. Military families experience ongoing stressors related to mobility, separation and risk. As a result, rates of spousal mental health challenges and child behavioural, academic, and social issues appear higher than civilian counterparts. Resiliency is a common concept used to explain the ability of families to rebound from and adapt to stressful events. Health professions recognize this growth of individuals and families as a crucial component to building resiliency in military contexts, but there is a lack of clarity in the research literature. The aim of this study was to explore how resiliency is defined and conceptualized in the military family research.

Methodology: Using the 5-step scoping review framework by Arksey & O'Malley (2005), literature was identified and synthesized on resilience in the military family research literature. Databases accessed included CINAHL, EMBASE, ERIC, PsychINFO, PsychNET, Social Sciences Citation Index, and Sociological Abstracts.

Results: A total of 640 articles were identified for potentials for review. Of those, 32 were identified as meeting inclusion and exclusion criteria and included for full data extraction. The majority of the articles came from the United States. The review included scientific research stud-

ies, opinion pieces and literature reviews. Resilience is a complex term used to describe military families without any consistent understanding of the definition. A number of resiliency models and clinical assessments were also identified in the review. Factors impacting military family resilience were identified as being contributors including belief systems, communication, coping, flexibility, locus of control and social support. Other factors were identified as being disruptors including deployment, frequent relocation, reintegration and separation. Military families are encouraged to become more resilient without any clear indication of what characteristic or component needs to be developed. Identifying key internal and community-based factors that promote resilience is key for those looking to promote or strengthen resilience among military families.

Conclusion: The research literature indicates that presumptions of resiliency or risk cannot be made. Contributing and disrupting factors identified can be used to help inform resources to support military families. Future research is required on environmental press and pulse clusters.

P132: School Disruption & Military-connected Students: A Scoping Review

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Queen's University

Introduction: In the National Defence and Canadian Forces Ombudsman's Special Report, *On the Homefront: Assessing the Well-being of Canada's Military Families in the New Millennium* (2013), it highlighted the impact that military life may have on the development of children. Children growing up in Canadian military families move at 3 to 4 times the frequency of their civilian peers, necessitating regular school transitions. Often, these moves are accompanied by protracted separation from family members and concern for their safety during training and deployment, along with loss of peer and extracurricular networks. In the past, 80% of Canadian Armed Forces families lived on base and children attended Department of National Defence (DND) schools; however, that school system no longer exists. The specific impacts on school participation are unclear in this population. Therefore, the purpose of this study was to determine what is known about school participation for children growing up in military families.

Methodology: Using Arksey and O'Malley's 5-step structured approach, a scoping review was selected to identify and synthesize knowledge on school participation and military-connected students. The main educational research databases, CBCA Education, ERIC, and Education Source, were searched, and potential sources were mined for additional references.

Results: A total of 472 distinct sources published between 1990-2015 were identified, with 89 proceeding to full analytic data extraction. Virtually all publications were American, with most exploring the academic challenges military-connected students commonly experience. School disruption takes a significant emotional toll on students and their families, and involves academic, social, and extra-curricular activities. Ecological factors impact school disruption, and can either improve or worsen the experience of the student. These include school culture, school infrastructure, and community collaboration. Improved liaison with schools and military bases is identified as key, along with professional development for health care practitioners regarding the unique challenges experienced by military-connected students and how to sensitively support them.

Conclusion: Much of the literature discussed the military-connected student as experiencing disrupted school participation across academic, social, and extra-curricular activities. The literature also explores the ecological factors impacting school participation—school culture, school infrastructure, and collaboration with the school. School personnel and professionals working with children need to understand their unique school disruption experience, military culture, and community capacity-building strategies.

P133: The Impact of Geographic Mobility on Access to Special Education Services for Military-Connected Children

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[1]Queen's University; [2]Mount Saint Vincent University

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 more frequently than their civilian counterparts. Transitions into new school settings may be complicated by distinct provincial and territorial special education legislation, definitions, and policies. This study explored the impacts of geographic mobility on access to special education and offers recommendations on how to better support military-connected students with special education needs who experience school transitions.

Methodology: Semi-structured interviews were conducted with six civilian caretakers who had a child transition special education systems within the last five years to explore their experience of navigating special education systems. The principles of Interpretive Phenomenological Analysis (IPA), as outlined by Smith, Flowers & Larkin (2009), were used to guide analysis and interpretation of the data.

Results: Three super-ordinate themes emerged from the qualitative interviews: 1) The Emotional/Cognitive Components of Experiencing a Transition, 2) The Practical/Logistical Components of Managing a Transition and, 3) Career Implications that may arise from having a Child with Special Education Needs. The emotional/cognitive theme explores the emotions that military families experienced throughout the transition process, including fear of losing supports, fear of losing funding, uncertainty regarding the child's future, uncertainty regarding a posting, feelings of isolation and family stress, and frustration with navigating new special education systems. The practical/logistical theme reports on the coping mechanisms that families employ to help manage transitions, including advocacy, explicit communication strategies, and developing supportive communities; it also identified a desire for increased availability of respite services, increased couples therapy access, and increased family support groups. The final theme captures the potential career implications that serving members and their spouses may experience as a result of having a child with special education needs.

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 Canadian military families. Personal experiences of the participants illustrated the profound effect that geographic mobility has on accessing services and highlighted the need to better support this population. Recommendations on how to ease the transition process were made, addressing military

specific resources as well as school and teacher competencies.

P134: Pilot Study on the Well-Being and Quality of Life of Ill/Injured Military Members and their Families: Descriptive Findings and Implications for Future Research

*Lee, J.E.C., PhD; Skomorovsky, A., PhD; Martynova, E., MA; Dursun, S., PhD

Department of National Defence

Introduction: The transition from military to civilian life can be challenging, particularly for military personnel experiencing illness or injury. In recent years, a growing number of studies have explored the difficulties encountered by members as they exit the military. However, recent work has emphasized the need to broaden the scope of this work to military families. In preparation for a planned study on the Transition and Well-being of CAF Member and Their Families, a pilot study was conducted to identify and develop measurement tools that may be used in the main study and underline new issues or topics on which analyses could elaborate in the main study.

Methodology: Paper surveys were administered between February and May of 2015 to approximately 600 ill or injured CAF members and their spouses (if applicable). Questionnaires included a number of existing scales in addition to several open-ended questions in order explore topics that have received little attention in past research in this area. For existing scales, missing data patterns in addition psychometric properties were examined to determine the need to adapt scales for the particular population under study. For open-ended questions, responses were first subjected to a thematic analysis. Proportions and modal responses were then examined to identify the most common themes and, possibly, topics that may be worth considering in future research.

Results: By and large, existing scales demonstrated sufficient psychometric properties, warranting their use in the main study. Results of thematic analyses of open-ended questions highlighted the wide range of physical and mental health problems experienced by participants, and pointed to spouses as a primary source of support for dealing with challenges arising from these health problems. Both ill/injured members and their spouses reported experiencing strain in their relationship because of the challenges faced in relation to the illness or injury.

Conclusion: While results of this pilot study may not be generalized to the entire population of ill/injured CAF members and their families, they provide valuable insight into measures and additional topics that may be considered in the main study. Further analysis is being carried out to explore relationships among different variables that were examined in the pilot study in view of developing an analysis framework for the main study.

P135: Turning Research into Results: Effective Collaboration between Research and Policy Professionals

*MacDougall, S., BBA; Roach, M., MA, MBA

Veterans Affairs Canada

Brief Description: Veterans Affairs Canada (VAC) is committed to evidence informed policy as it enables the development of efficient and effective strategies to address public policy issues and achieve results. Like most organizations that develop policy, VAC has periodically experienced the challenge of doing so without sufficient time or evidence to fully develop policy proposals. When this happens, the risk of inefficient and ineffective policy solutions increases. While it is inevitable that external factors, beyond an organization's control, will put pressure on researchers and policy makers, through effective and deliberate internal action, these functions can be insulated from external pressures, lowering the risk of ineffective policy.

Based on the practical experience of VAC policy makers and research professionals gained over several government policy cycles, we will provide an overview of VAC's policy development framework, with examples of how VAC researchers conduct relevant studies to answer questions facing VAC policymakers; how research is integrated into policy and program design, the challenges faced by researchers and policy makers; pressures that can influence policy design; key considerations of decision makers; and the steps VAC has taken to mitigate the risk of ineffective and inefficient policy by deliberate actions taken on issues that are completely within its control to support a strong policy/research interface (e.g., organizational structure, establishing relationships and aligning planning and operational processes).

Clinical Outcomes: Ensure Canadian Armed Forces (CAF) Veterans and their families experience well-being by leveraging the benefits of evidenced-informed policy.

Patient Population: CAF Veterans and their families, policy and research professionals at VAC, and VAC leadership who have responsibility for the well-being of Veterans and their families.

Conclusion: An institutionalized VAC policy and research interface supports sound policy development and collaboration leading to evidenced inform policy decisions, improved effectiveness of Veterans programs and ultimately the improved well-being of Veterans and their families.

P136: Assessing the Needs of Military Communities

*Manser, L., Mmgt

Department of National Defence

Introduction: Canadian Forces Morale and Welfare Services (CFMWS) is responsible for delivering public morale and welfare programs, services and activities to Canadian military communities. These include family support services, fitness and health, sports and recreation, deployment support, messes, newspapers and other special interest activities. In order to be responsive to Canadian Armed Forces (CAF) members and their families, to assist Base/Wing Commanders in determining the unique needs of their community and to offer flexibility in determining services, a new comprehensive military community needs assessments (CNA) tool is being implemented based on externally validated measures.

Methodology: The military CNA is an online survey completed by military community members biannually with questions focused around 7 main components:

1. Context (e.g. location, demographics).

2. What have respondents experienced as problems? The framework captures experiences across 9 domains that military families self-define as rising to the level of a problem (work/life balance, household management, financial, legal, health care, relationship, child well-being, spousal well-being and personal well-being). For

those with problems in multiple domains, respondents are asked to prioritize the most significant problems.

3. What types of help did respondents need in order to address their most significant problems (e.g., the need for information, advocate, counselling)? Which of those problem-related needs did they deem the greatest?

4. What resources did families contact to try to meet the most important needs?

5. What factors made resources easier or more difficult to access? What barriers and bridges did the respondents perceive or encounter?

6. Did the resources that respondents contacted actually help them meet their problem-related needs?

7. What is the connection between met needs and outcomes?

Results: The new military CNA is currently being implemented and results are expected in fall 2016. Data will be analyzed nationally to ensure accuracy and consistency, resulting in a national trends report and individual community-specific reports.

Conclusion: The new military CNA tool links the most pressing problems of military families to their self-defined needs. Then, within that context, it allows for the direct comparison between service usage and satisfaction with family perceptions of how their needs have been addressed. Through the new military CNA tool, CAF members will have the opportunity for active and meaningful participation in the development, delivery and evaluation of their morale and welfare programs and services.

P137: A Decade of Longitudinal Resilience Research in the Military across The Technical Cooperation Program's Five Nations

*Sudom, K.A., PhD; Lee, J.E.C., PhD

Department of National Defence

Introduction: Military personnel are exposed to stressors throughout their career, from training and separation from family to potentially traumatic experiences in combat. Identifying factors that foster resilience against the adverse effects of stress is important for military organizations to provide an empirical basis for the development of resilience training and intervention programs. Given the dynamic nature of resilience, longitudinal research is crucial to better understanding its related processes. To this end, a review of longitudinal resilience research among military personnel across The Technical Cooperation Program (TTCP) nations over the past decade was conducted.

Methodology: A search for relevant papers published since 2005 was conducted in EBSCOhost, PsychInfo, and Web of Science. In addition, requests were sent to resilience subject matter experts across TTCP nations for relevant internal reports published during this time. In order to be included in the review, papers had to involve multiple time points of data collection and focus on psychological or behavioural outcomes assessed at later data collection points.

Results: A total of 37 papers and/or reports were identified and included in the review. Although the numbers of cross-sectional stud-

ies on psychological resilience have increased over the past 10 years, there are still relatively few longitudinal studies on resilience in military populations, especially outside of the US. As well, the results of the studies are varied, due at least in part to differences in methodological and theoretical approaches across studies. Papers focused on a range of psychological and behavioural outcomes, including mental health, violence and aggression, and training success. While this work has made some valuable contributions, some research gaps remain and are discussed.

Conclusion: Longitudinal studies on psychological resilience in the past decade across TTCP nations have focused on a range of psychological and behavioural outcomes, including mental health, post-traumatic growth, violence and aggression, and training success, as well as the processes that may mediate or moderate the relationship between trauma and outcomes, such as hardiness and social support. Longitudinal studies are inherently more complex and costly; however, such studies are important in order to examine the process of resilience in relation to mental health and other outcomes, as well as in determining how resilience changes over time and is affected by deployment and other stressors. Such research will also help to identify factors to target in resilience-building interventions, and to identify groups who may be most at risk for mental health problems.

P138: Implications for Military and Veteran Families: A Scoping Review of Cultural Competency Models

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[1]Queen's University; [2]Canadian Institute for Military and Veteran Health Research; [3]Dalhousie University; [4]Strongest Families Institute

Introduction: The National Defence and Canadian Forces Ombudsman's Special Report, *On the Homefront: Assessing the Well-being of Canada's Military Families in the New Millennium* (2013) describes how the military affects the lives of Canadian military families. Frequent relocation can present challenges to the stability, mental health and well-being of military families (Cramm, Norris, Tam-Seto, Eichler & Smith-Evans, 2015) compounded by the stressors of accessing and navigating different healthcare systems. Unlike their American counterparts, military families in Canada access the civilian health care system (Sullivan, 2014).

Healthcare system navigation challenges and the prevalence of Operational Stress Injuries in the family are a few of the stressors regularly faced by many Canadian military and Veteran families. Although these are identified factors impacting on family health and well-being, little else is known about their experiences in the healthcare system. Quality and continuity of care within the civilian healthcare system may not adequately meet the needs of the service members, Veterans and their families if health professionals have limited understanding of the realities of military family life (Ombudsman Department of Nation Defence and Canadian Forces, 2013), thus identifying the need for increased cultural competency among health care providers.

Cultural competence models articulate a list of knowledge, skills, abilities or personal traits required for a specific job or function (Lucas, Michalopoulou, Falzarano, Menon, & Cunningham, 2008). The degree to which existing cultural competency models can be applied to the healthcare experience of Canadian MVF is unclear. The purpose of this presentation is to explore the extent to which results of a scoping review of cultural competency models may be used to inform health care to military and Veteran families.

Methodology: This scoping review will be using Arksey and O'Malley's (2005) 5-step structured approach to identifying, selecting and synthesizing knowledge on cultural competency models in health care service delivery. The databases that will be accessed include: CINAHL, MEDLINE, EMBASE, REHABDATA, AMED, PsychInfo, HealthSTAR, and Summons.

Results: Approximately 100 citations published up until 2016 were identified and will be reviewed in this study. Data review and extraction will include the following areas: specific population that model is addressing; intended health care population using model; process of model development and validation; process of model implementation; and description of knowledge translation and professional development tools.

Conclusion: The results of this scoping review will be used to inform the development of cultural competency model for health care providers working with Canadian military and Veteran families.

P139: Role of Mastery in the Disparity between Functional Limitations and Perceived Need for Assistance among Ill or Injured Canadian Military Personnel

Watkins, K. MA; Lee, J.E.C., PhD; Skomorovsky, A., PhD

Department of National Defence

Introduction: Functional limitations (i.e., difficulties in conducting daily activities) due to illness or injury generally correspond with a high perceived need for assistance of others in performing tasks, such as running errands or managing finances. Nevertheless, other factors, such as one's feelings of self-efficacy or mastery, may contribute to discrepancies between functional limitations and perceived need, such that high functional limitations be associated with a low perceived need for assistance, or vice versa.

Methodology: The present study investigated the role of mastery in the relationship between functional limitations and perceived need for assistance among 164 ill or injured Canadian Armed Forces (CAF) members. Participants, recruited via the Second Career Assistance Network or Military Family Resource Centres, completed a paper survey measuring various aspects of health, as well as personality variables, such as mastery. To assess functional limitations, participants were asked to report the general degree of impairment and frequency of limitations experienced in various activities. For illness- or injury-related need for assistance, participants reported the frequency of needing help with various activities.

Results: The majority (75.9%) of participants showed concordance on the two variables (i.e., high functional limitations and high perceived need for assistance; low functional limitations and low perceived need for assistance). However, 10.5% reported low functional limitations and high perceived need for assistance, while 13.6% endorsed high functional limitations and low perceived need for assistance. An analysis of variance indicated that participants with high functional limitations and low perceived need for assistance reported significantly higher levels of mastery than both those with low functional limitations and high perceived need for assistance and high functional limitations and high perceived need for assistance.

Conclusion: Results suggest that mastery plays an important role

when functional limitations do not accord with perceived need for assistance. Specifically, mastery can be associated with a lower perceived need for assistance when functional limitations are high, which may be detrimental in receiving urgently required help. Implications for the CAF will be discussed.

P140: Developmental Assets and Their Relation to School Engagement in Canadian Military Children

Wheeler, B., BSc; Schwartz, K., PhD; Stelnicki, A., MSc

University of Calgary

Introduction: Children in military families often experience a number of stressors that are relatively uncommon amongst civilian children such as frequent relocations and changing schools (Kimitto, et al, 2011). Previous research indicates that such school changes may negatively impact their academic performance (Lyle, 2006). Additionally, children of military families have reported lower rates of belonging and school support and have more difficulty adjusting to new schools and developing supportive relationships with both peers and teachers (De Pedro, Astor, Gilreath, Benbenishty, & Esqueda, 2014; Mmari, Roche, Sudhinaraset, & Blum, 2009).

One factor that may help protect against such negative educational outcomes and promote positive ones is school engagement (Fredricks, Blumenfeld & Paris, 2004). School engagement is a multifaceted construct that refers to one's behavioural, emotional, and cognitive engagement with school. More specifically, it includes effort extended in the learning process, participation in extracurricular activities and one's attitudes towards school, their teachers and their classmates (Fredricks et al, 2004). Previous research on non-military populations has shown that both internal and environmental assets are positively related to school engagement and subsequently academic performance (Yibing, Lerner & Lerner, 2010). However, no results have been published on military children's assets and their relationship to school engagement. Thus, this study intends to identify such strengths and to determine how they help promote positive development in the environments in which military children exist, such as schools.

Two questions are posted: 1) What internal and external developmental assets exist within children raised in Canadian Armed Forces (CAF) families? 2) How do these strengths promote both school engagement and academic self-efficacy?

Methodology: Participants were recruited as a part of a larger study that examined the strengths of Canadian Military Families. To be eligible for this study participants needed to be between eight and 18 years old and have at least one parent who served in the Canadian Armed Forces as a Regular or Reserve Force member within the last five years. Participants completed online questionnaires including a measure of developmental assets (DAP-P; Search Institute, 2012 & DAP; Search Institute, 2004), The School Engagement Scales (Fredricks, Blumenfeld, Friedel, & Paris, 2005) and The Student Self-Report of Academic Self-Efficacy (Hoover-Dempsey & Sandler, 2005).

Results: Preliminary results will be presented.

Conclusion: It is important to conduct research that will help inform ways to promote positive development, including academic performance, among Canadian military children. This study aims to do so by identifying the internal and external assets that promote school

engagement. Such findings can subsequently inform programming and intervention.

Transition from Military to Civilian Life

Podium Presentations

1D01: Findings from a 2016 International Summit on Military-Civilian Transition

Pedlar, D., PhD

Veterans Affairs Canada

Introduction: Military to civilian transition (MCT) is a significant and usually inevitable life transition for military personnel and their families. Following the conflicts in Afghanistan and Iraq and the ongoing international military operations since the Gulf War, there is intense worldwide interest in evidence-based solutions to assist serving military personnel with transition from military to civilian life. Currently, there is no unifying theoretical or conceptual framework for MCT. This significant knowledge gap hampers the development of effective programs and services to support military personnel, Veterans and their families during MCT, and hampers effective research.

Methodology: With the objective of developing an MCT theoretical and conceptual framework, a "Military to Civilian Transition Summit" was held at the University of Southern California (USC Los Angeles) on March 22-23, 2016. This event brought together 23 experts from Canada, the United States, the United Kingdom, the Netherlands, Australia and New Zealand, including academics involved in research and non-academics involved in MCT planning. Both Veterans Affairs Canada and the United States Department of Veterans Affairs were represented at the event. The Summit was co-hosted by the Center for Innovation and Research on Veterans & Military Families and the Canadian Institute for Military and Veteran Health Research (CIMVHR). The project was also supported by the Fulbright Canada Visiting Research Chair Program.

Results: A summary of the Expert Panel findings will be presented including: (1) findings of a comprehensive MCT literature review; (2) identification of core MCT concepts required to build a theory and conceptual framework; (3) progress on an MCT theory and conceptual framework; and (4) identification of MCT research priorities and gaps using the theory and framework.

Conclusion: Findings from the Expert Panel enable participants to remain current with the leading edge of expert knowledge in MCT policy, program and service delivery.

1D02: Post-Service Identity: The Role of Moral Injury on the Military to Civilian Transition

*Albright, D. L., PhD, US Army (Ret'd)[1]; *Hamner, K., PhD[1]; Currier, J., PhD[2]

[1]The University of Alabama; [2]The University of South Alabama

Introduction: Military personnel may experience situations that might violate deeply held moral beliefs/values. These types of situations can result in moral injuries, which are defined as consequences of "perpetrating, failing to prevent, bearing witness to, or learning about acts that transgress deeply held moral beliefs and expectations." These moral injuries are associated with an increased likelihood of a variety of deleterious outcomes, including depression, guilt, intra- and interpersonal conflict, posttraumatic stress disorder, shame, and sui-

cidal ideation.

The emerging construct of moral injury is situated in individual and shared expectations about high profile events (e.g., military atrocities and/or killing). From a Goffmanian perspective, these front stage shared expectations (built upon setting, appearance, and manner) often conflict with back stage individual realities. This can result in performance disruptions that are further complicated by the ubiquity and influence of mass media information on the audience that threatens to discredit a veteran actor's performance.

The purpose of the study is to inform the development of interventions to facilitate successful military to civilian transition. We propose to present our findings on the role of moral injury on the post-military service situated identity.

Methodology: The study is being conducted in two phases using an exploratory sequential design in which qualitative/quantitative methods will be mixed during data collection and interpretation. Eligible participants (English speaking and US military service status) are being recruited for both phases in the southeastern United States. Phase 1 is using qualitative methods, including individual interviews and focus groups; these data are being analyzed with a thematic and grounded dimensional approach. Phase 2 will be using quantitative method (survey).

Results: Preliminary results suggest that successful post-service identity is likely negotiated by a veteran actor and audience through the creation of a shared sense of responsibility and connectedness on the basis of socially sanctioned moral beliefs/values (i.e., working consensus). This working consensus is built on shared meaning of military-related experiences, which is often delimited by moral parameters that are threatened by moral injuries.

Conclusion: Further investigation is warranted. Programming on building working consensuses might prove useful to facilitate successful military to civilian transition and post-service identities for veteran actors and audiences.

1D03: Mental Health and Well-Being of Military Veterans during Military to Civilian Transition: Review and Analysis of the Recent Literature

Shields, D., PhD; Kuhl, D., MD, PhD

University of British Columbia.

Introduction: A review of the literature on military personnel's transition from military to civilian life (MCT) was conducted as part of VAC's *Road to Civilian Life* research initiative. The objective was to synthesize current knowledge about how this life transition impacts Veterans' adjustment, mental health and well-being post-release, and to identify gaps and limitations in the knowledge base.

Methodology: A search was carried out in December 2015 for English language documents and articles published from 2000 to the present through ten digital library catalogues. Databases searched included Medline, PsychInfo, EMBASE, CINAHL, Social Work Abstracts, Sociological Abstracts, Social Service Abstracts, America History and Life, Historical Abstracts, and History of Science, Technology and Medicine. Government technical reports or government appointed committees' reports, and results from expert panels were also identified and collected based on consultations with the Veterans Affairs Canada Scientific Authority staff. An initial base-set of 901 document abstracts were

reviewed by the two primary investigators resulting in 417 references being retained for more substantive review. Of these, three hundred and six documents were identified that were pertinent or informative about the MCT process and were included for annotation and analysis.

Results: Detailed analysis of a rapidly expanding literature concerning Veterans' health and well-being suggests that military to civilian transition, as an event, is not well defined in the research, and multiple terminologies are in use across nations, service types and disciplines. Research tends to be focused within disciplinary or special interest silos and multiple conceptual frameworks are being elaborated with little consensus seeming to emerge. There is also no clear consensus regarding how to organize the pertinent literature, nor agreement on how to define the scope of what is pertinent.

Conclusion: It is clear that the volume and diversity of the material presents challenges to those attempting to synthesize this research to inform policy and practice. Recommendations to address these limitations include better coordination of research efforts, language, and priorities within and between nations. An agreed upon conceptual framework is required to inform knowledge gap analysis, as well as an accepted taxonomy for organizing the research. A categorization based on the WHO's International Classification of Health and Functioning (ICF) is presented as one possible organizing model. This research review identified that there is a need to better focus the full spectrum of recent research evidence in order to understand how to influence transition trajectories and to provide early and optimal care and support for those who are struggling.

1D04: Factors Associated with Work Satisfaction among Veterans

MacLean, MB., MA; VanTil, L., MSc; Sweet, J., MSc; Poirier, A; McKinnon, K.

Veterans Affairs Canada

Introduction: Employment plays an important role in transition to civilian life. While little is known about what contributes to work satisfaction among Veterans, it could involve satisfaction with earnings, job security, the work itself, hours of work, work life balance, the ability to transfer skills used in the military and military occupation. In Canada, those Veterans satisfied with their job were found to have lower rates of difficult adjustment to civilian life (MacLean et al, 2014).

Methodology: This study analysed data from a national sample of 3,154 Veterans released from the Regular Canadian Forces between 1998 and 2007 in a cross-sectional survey conducted as part of the in 2010 Life After Service Studies program of research. Satisfaction with work was examined by various service and demographic characteristics and other factors thought to be associated with work satisfaction. Rates of work satisfaction were examined by three groups: cadets/privates/recruits, NCMs and officers. Both unadjusted and adjusted logistic regression models were produced for each rank grouping as factors associated with work satisfaction appeared to differ by rank.

Results: Work satisfaction rates varied considerably by rank and were highest among officers and lowest among lower ranking Veterans. Factors associated with work satisfaction also varied by rank. For NCMs, even those at the lowest ranks of private/recruit/cadets, only satisfaction with finances was associated with work satisfaction. For officers, involuntary release and service of less than two years were associated with lower odds of civilian work satisfaction. Some factors were not associated with work satisfaction, such as whether civilian income was higher or lower than income while in the military and level of authority in comparison to military career.

Conclusion: Among officers, work satisfaction was associated with involuntary release and years of service. Only satisfaction with finances was associated with work satisfaction among NCMs and privates/recruits/cadets. This suggests the need for taking rank into account when developing strategies to improve the labour-market outcomes of Veterans. Work satisfaction rates were lowest among private/recruits and cadets who accounted for one-quarter of the working population, suggesting that strategies targeted to this group would improve overall Veteran work satisfaction rates. Further research is needed to better understand the relationship between satisfaction with finances and work satisfaction.

1D05: Transition from Military to Civilian Life

VanTil, L., MSc; MacLean, M.B., MA; Thompson, J.M., MD; McKinnon, K.; Poirier, A.; Sweet, J., MSc

Veterans Affairs Canada

Introduction: Adjustment to civilian life after release from the military is a multi-dimensional concept that was studied as part of the Life After Service Studies (LASS). Multiple dimensions were explored for Canadian Veterans living in the general population.

Methodology: LASS 2013 was a computer-assisted telephone survey of Canadian Veterans released between 1998 and 2012 from either the Regular Force or the Primary Reserve Force. It was conducted by Statistics Canada, with a response rate of 70%, and 90% of these Veterans agreed to share their responses with Veterans Affairs Canada (n=4,149).

Results: Among Veterans of the Regular Force, 27% reported a difficult adjustment to civilian life. This was similar to the 25% found in LASS 2010. Among Veterans of the Reserve Force, 25% reported a difficult adjustment if they had deployed (Class C service). Among Veterans of the Reserve Force without deployment experience, 11% reported a difficult adjustment. Other characteristics were also explored to better describe the dimensions of adjustment, and the characteristics of those with a difficult adjustment.

Conclusion: Most Veterans adjust well to civilian life. Difficult adjustments are experienced by some groups of Veterans that require a multi-disciplinary approach to services, to support them during transition.

2B05: Understanding the Needs of Families of Medically Releasing CAF Personnel

Manser, L., Mmgt

Department of National Defence

Introduction: There is increasing public attention on the challenges faced by Canadian Armed Forces personnel who are transitioning from active service through the medical release process to Veteran status. There is also increasing concern for the families caring for ill and injured personnel and veterans. Military Family Services researchers conducted an environmental scan and survey of Military Family Resource Centre (MFRC) subject matter experts (SME) in conjunction with a literature review. The purpose of both the literature review and the MFRC environmental scan and SME survey was to assess the needs of medically releasing personnel and their families, prioritize the support services they require, compile existing resources and best practice programs, and determine priority areas to care for caregivers.

Methodology: Approximately 75 different research reports, peer-reviewed journal articles, factsheets and other publications were reviewed based on a selection process limited to only those that addressed either the impacts on or services to families caring for an ill/injured military member and were predominantly Canadian. An online survey was developed based on the literature review and feedback from key SMEs. The survey focused on identifying major struggles, support needs and information requirements in 4 main areas – general trends, pre-release experience, post-release experience and caregiver experience. In total, there were 40 SME respondents from 24 different locations.

Results: Results from the literature review show that approximately 1,000 military members are medically released each year, with 700 spouses and 850 children impacted. The impacts on these families vary greatly based on a number of factors. Most families transition to civilian life successfully, but some require additional supports. SMEs believe families of medically releasing personnel primarily require advocacy support to navigate systems, assistance to secure civilian care providers, education and information on illness/injury and its impacts, respite from caregiving responsibilities, social and peer support, and psychosocial support.

Conclusion: Recommendations were offered to guide the delivery of effective services for families of medically releasing personnel, including:

- Tailor services using the injury recovery trajectory;
- Use existing evidence-based strategies including family education on the injury/illness and recovery process, family care management, emotion regulation skills development, injury communication training, and development of problem-solving and shared goals;
- Understand and support community provider capacity; and
- Develop resources for families and MFRCs that describe the transition process and key timelines, and compile all services and benefits available.

3E01: Group Interpersonal Psychotherapy Addressing the Transition to Civilian Life for Canadian Armed Forces Veterans with Operational Stress Injuries: 3-year Experience

*Auger, E., MD; Turgeon, M.H., MD; Patry, S., MD

Centre intégré universitaire de santé et de services sociaux de la Capitale Nationale

Brief Description: Interpersonal Psychotherapy (IPT) is a recognized treatment for major depressive disorders. It has recently been tested successfully as a treatment of post-traumatic stress disorder (PTSD). IPT is brief and focus-oriented, and has been developed for group and individual treatment. It revolves around four types of focus including role transition. Military personnel with operational stress injuries (OSI) are confronted with leaving the military environment and adjusting to civilian life. This role transition is often important in the recovery of patients with an OSI. IPT group therapy is currently being tested at our OSI clinic with the assumptions that this type of therapy in group format will have a beneficial, direct effect on the depressive symptoms pertaining to this role transition, and could have an indirect beneficial effect on PTSD symptoms. Hopefully, patients will improve their level of functioning with this treatment. Modifications have been made to the treatment protocol following the results from the two first trials. This treatment is currently in its third trial.

Clinical Outcomes: Results from the first trial were encouraging. Five out of six patients finished the treatment and mean PHQ-9 drop was 7.6 points. The mean PCL-M drop was 6.6 points where 2 patients had drops of more than fifteen points. Results from the second trial were not as strong. Eight of the initial eleven patients finished treatment with a mean PHQ-9 drop of 3 points. PCL-M scores did not vary significantly with treatment. Assumptions for these results were: too large a group, a much more depressed population (almost half of the participants had a PHQ-9 score in the severe category at the beginning of treatment), and silent participants who slowed down the group process. The third trial started with eight patients, who after seven sessions, are still in treatment. Preliminary results show a 3 points drop in the mean PHQ-9 scores after six sessions. The Sheehan Disability Scale has been added to evaluate the level of functioning. Final results from the third trial will be presented.

Patient Population: Veterans from the Canadian Armed Forces or close to release military personnel with a recognised OSI treated at the Quebec City OSI Clinic. All participants have significant depressive symptoms or a major depressive disorder. Not all participants have the PTSD diagnosis.

Conclusion: This IPT group treatment is a work in progress. We are learning from the first trials of the treatment and building a protocol that should help veterans re-adjust to civilian life.

3E04: The Role of Veteran Peer Support Specialists in the Transition from Military to Veteran Life

*Harris, J., MSW[1]; Tran, K., PhD[2]; Wallace, M., MA[1]

[1]American Legion Post 28; [2]Fayetteville State University

Brief Description: The transition and community reintegration for service members and veteran individuals is a process that is complicated by a high demand for resources from institutions and organizations that are often not familiar or trained in military culture. In addition to impeding the delivery of military culturally competent services for veterans, this gap in knowledge also hinders the adjustment of the individual within their own communities. Of the existing support programs, the focus has been largely on systems transition instead of a culture of community reintegration. Most importantly, resiliency and wellness efforts have not fully engaged the wisdom of lived experience of colleagues such as veteran peer support specialists. Further, they have the capacity to be the link for the veterans' family and caregivers and serve as advocates to the larger community.

Clinical Outcomes: To date, 85 CSPSS-V have been trained and certified and placed in settings such as the Veterans Administration Medical Centers, community mental health agencies, vocational rehabilitation, veteran non-profit agencies (i.e. The American Legion), universities and North Carolina state mental health agencies. Additionally, veteran peer support specialists have been engaged to assist student veterans within the University of North Carolina campuses.

Patient Population: Military, veterans and their families in transition, reintegration and recovery from mental health and substance abuse issues.

Conclusion: Certified veteran peer support (CPSS-V) specialists serve as the essential bridge between entities such as hospitals, behavioral health agencies, education, employment and the veterans' family, home and community. By utilizing a common shared lived experience, CPSS-V specialists build trust with service members, veterans and their families which ultimately reduces stigma towards

treatment, supports successful recovery and facilitates a smoother transition into civilian communities.

4C02: Exploring Veteran Identity and Perceived Veteran Discrimination in Civilian Settings: A Tri-Ethnic Comparison

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University of Southern California

Introduction: Building on the stereotype threat (Steele & Aronson, 1995) literature, the *veteran stereotype threat* model attempts to explain how negative perceptions of veterans in a particular civilian setting generates feelings of anxiety, which could result in veterans' behavioral disengagement from that environment. However, veteran stereotype threat could vary as a function of stronger affiliation with the veteran group or, considering the ethnic diversity within the all-volunteer force, whether the veteran is simultaneously a member of an ethnic minority group (e.g., Blacks, Latinos). This paper will present findings on a portion of the *veteran stereotype threat model*, and focus on veteran identity, and perceived veteran discrimination and its related stress in various civilian settings (e.g., employment).

Methodology: This cross-sectional study utilized survey methods on a convenience sample of white (n=95), Black (n=48), and Latino (n=106) veterans. Participants came from a subsample of the Los Angeles County Veteran's Survey (N=1,850). Participants competed an online survey containing various measures including veteran group identification (α=.91), and questions on being treated unfairly by employers, people in the helping profession (e.g., doctors), and neighbors owing to participants' veteran status. Finally, participants reported on the level of stress associated with being treated unfairly in each civilian setting.

Results: Black veterans (M=3.71) identified more strongly with the veteran group compared to Latino (M=3.64) and white (M=3.49) veterans, F=3.29, p

Conclusion: Overall, veterans who identified more strongly with the veteran group reported greater unfair treatment and higher levels of stress in various civilian settings. In our case, these findings were observed among Black veterans. That Latino and white veterans had a similar pattern of results could be a demographic artifact of Los Angeles County (48% Latino, 28% white): while whites are the historically powerful ethnic group, Latinos are the numerical majority. Implications for military-civilian transition will be discussed.

Poster Presentations

P147: Enabling Evidence Based Policy Making: Veterans Benefits Actuarial Tool (VBAT)

*Cue, C., Col (Retd)

Office of the Veterans Ombudsman

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Methodology: The tool, by generating actuarial scenarios, provided the empirical evidence needed to analyze the life-long impact of the financial benefits available under the NVC to Veterans and their families. The tool has evolved with changes to the NVC and has been improved.

The latest version of VBAT allows for all existing Veterans financial benefits to be selected (or deselected) to allow the analyst to compare existing or theoretical benefit scenarios against each other. Values of existing benefits can be changed and new benefits can be added. Actuarial tables of payments are created, as well as a visual display of the lifetime payment broken down by benefit type and the annual payments that a Veteran would receive over their lifetime.

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Conclusion: To be presented at CIMVHR Forum

P148: Canadian Armed Forces – Veterans Affairs Canada Drug Benefit Lists Alignment: One Year Later

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Brief Description: While on active duty, Canadian Armed Forces (CAF) personnel receive comprehensive coverage for medications from the Canadian Forces Health Services Group (CF H Svcs Gp). Following release, however, Veterans Affairs Canada (VAC) provides ongoing coverage for medications which are related to injuries incurred during military service. A previous comparison of drug benefits offered by these two programs identified some instances of mismatches in drug coverage, but also noted a high degree of overlap between the programs overall. Since then, additional work has been undertaken to better align the work processes of the two drug plans, such that discordant listing decisions and risks of treatment disruption are further reduced.

Clinical Outcomes: The results of the comparison between the CAF and VAC drug benefit lists were presented at CIMVHR 2015. A number of different initiatives have been undertaken to align these benefit lists. Medications in therapeutic areas which are associated with greater risk in the event of treatment disruption or delay, or which are known to have discordant listing status between departments, have been assigned higher priority to undergo joint review. The re-alignment of both drug benefit lists will facilitate the transition of CAF members to VAC. This presentation will focus on what implementation steps have been undertaken, using the research that was conducted and presented. It will also present the way ahead on this initiative.

Patient Population: The program is primarily expected to yield benefits to CAF personnel who are releasing as a result of service-related medical conditions. Greater alignment of the VAC and CAF drug benefit programs may also be beneficial in reducing disruptions in drug coverage among CAF personnel.

Conclusion: Following comparison of the drug benefit sets of VAC and the CAF, the two departments have identified a number of new work processes, which are expected to bring the two drug programs into closer alignment. This presentation describes how research can be turned into practice that has a direct impact on patient care.

P149: The Intensive Journal: A Professionally Facilitated Journal Writing Program for Therapeutic Healing from the Stress of Trauma

Israel, W., MTh[1]; Progoff, I., PhD[2]

[1]University of Victoria; [2]Drew University

Brief Description: The Intensive Journal program is a facilitated self-help, writing system for enabling adults to transit the negative, stressful effects of trauma.

Developed by Dr. Ira Progoff in the mid-20th century, this unique therapeutic process is premised on a hypothesis of holistic depth psychology.

- Holistic: Whole organic entities (systems) are greater and more dynamic than the mere sum of their component parts
- Depth: The quality of a person's inwardly perceived self-understanding. A perception of self-derived from one's empirical life-experience, inclusive of non-cognitive and unconscious life events.
- Psychology: In contrast to a conception of psychology as a descriptive (analytic or diagnostic) science, Dr. Progoff explains it as an "evocative" discipline. It is an "evocative" process that enables a natural, open-ended, holistic sense of self. It hypothesizes an inborn, creative, and self-healing capacity of the human psyche.

It is a professionally facilitated journal writing process, undertaken in small group workshop session of 12 hours duration over a two day period.

This private, individual journal writing is undertaken in a quiet, safe, meditative environment with 10-15 volunteer participants. The hand-written journal exercises includes meditative private reflection. The process is devoid of analysis, judgement or diagnosis. Brief periods for reading allowed and are for self-reflection only. No group "cross-talk" or verbal interaction whatsoever. The facilitator's role is to "consult/suggest" other sections of the Journal Workbook where the private writing continue. Beginning with journal entries focused on "surface/cognitive" experience, the writing progresses toward transpersonal issues and non-cognitive experiences of dreams, twilight (meditative) imagery and synchronicity.

Clinical Outcomes: Client outcomes have been measured for prison inmate participants (volunteers) and indicate significant improvements in recidivism for those released on parole. (Folsom Prison, California)

Other clinical outcomes are self-reported, qualitative and anecdotal. (Improved quality of life; reduced stress; recovery from trauma and illness)

Sample testimonial "letters" available from a volunteer participant population of more than 200,000 participants since 1970. (International website is www.intensivejournal.org)

Patient Population: Adults (18+ years of age) who have basic literacy skills of reading and writing. Includes military, civilians, prison inmates and those suffering from trauma, including Adverse Childhood Experiences as described in the Kaiser-Permanente ACE studies (California, USA). Also includes those in recovery from substance abuse and behavioural addictions.

Conclusion: The Intensive Journal program offers a unique and well-tested program for enabling (volunteer) adults to successfully transit and recover from a wide range of traumatic experience(s). This is a creative, safe, self-paced therapeutic process that effectively facilitates the natural healing function of the human psyche.

P150: Transitions professionnelles et leurs deuils

*Girard-Grenier, C., MA; *Lemelin, D., MA*

Centre de la famille Valcartier

Brief Description: Les stratégies d'interventions ainsi que le contenu de l'intervention prennent appuie sur trois théories distinctes. Les théories de Scholssberg (2011) et de Bridges (2006) ciblent les effets d'une transition et les ressources pouvant aider à bien évoluer au cours de cette dernière. La théorie sur le processus du deuil basée sur le modèle intégratif appliqué au modèle de l'intervention créé par Doris Langlois (2009) met en lumière les phases de deuil que les militaires seront susceptibles de vivre au courant de leur transition vers la vie civile. L'objectif général de l'intervention de groupe est de faire en sorte que les membres et les intervenants de la communauté militaires prennent conscience des difficultés potentielles reliées aux deuils vécus dans la transition socioprofessionnelle vers la vie civile et les outillés afin de jongler avec les ressources acquises dans l'insertion civile.

Clinical Outcomes: Les moyens utilisés pour répertorier les résultats : création d'une évaluation de l'atelier post-intervention, témoignages. De façon général, les participants ont indiqué que la présentation a répondu à leurs besoins et qu'ils le recommanderaient : 38 participants sur 51 (74.5%) recommanderaient l'atelier.

Patient Population: La population visée : les militaires en voie d'une éventuelle libération médicale de l'armée, leur famille ainsi que les intervenants œuvrant auprès de cette population. L'atelier inclus : les militaires ayant une date de libération dans les 6 prochains mois et les membres de leur famille (conjoint(e), enfant de plus de 18 ans), les militaires déjà libérés. Les participants exclus : les militaires actifs et les intervenants œuvrant dans la communauté civile n'ayant pas de contact avec la dite population visée. 51 personnes ont participé à l'atelier :

- Présentation de 45 minutes dans le cadre de la Foire de l'Emploi de Québec : 20 personnes issues de la communauté civile et militaire;
- Atelier de 2 heures : 5 intervenants oeuvrant auprès de la communauté militaire (Manuvie, Centre de la Famille Valcartier et Clinique TSO);
- Présentation en collaboration avec le secteur du soutien aux absences et aux mutations : 20 personnes vivant une mutation;
- Atelier : 2 groupes de militaires (total de 6) en processus de libération (6 heures d'atelier).

Conclusion: Pour conclure, à partir des évaluations et des témoignages recueillies, il est possible d'affirmer que ce programme d'aide à la

transition permet à la communauté militaire et aux intervenants de démystifier les transitions vécues, de briser l'isolement, de créer un réseau de soutien et d'entraide et d'évoluer dans la trajectoire de deuil. De plus, ce programme permet de favoriser l'insertion socioprofessionnelle des militaires en processus de libération ou ayant vécu un tel processus.

P151: Canadian Public Opinion of the Armed Forces

Mahar, A.L., PhD (Cand)[1,2,3]; Gribble, R., PhD (Cand)[2]; Aiken, A.B., PhD[1,3]; Dandeker, C., PhD[2]; Duffy, B., MA (Cand)[4]; Gottfried, G., PhD[4]; Booth, C., MSc[4]; Wessely, S., PhD[2]; Fear, N.T., PhD[2]

[1]Queen's University; [2]King's College London; [3]Canadian Institute of Military & Veteran Health Research; [4]IPSOS-Mori Social Research Institute

Introduction: A positive public opinion of a country's military helps to maintain morale of active and ex-service members, generate financial backing for military support services and influence political decision-making. Critical to this is the accurate perception of the military in the public, although this may be influenced by media and charitable organizations which often play a key role in disseminating information about the military to the public. Despite the importance of public opinion, little is known in Canada about how Canadians perceive the Canadian Armed Forces (CAF), and the issues they may face while serving or after leaving service.

Methodology: As part of a larger, international study in 2015, IPSOS-Mori conducted an online survey of 1000 Canadians aged 18-64 years to understand their perception of the CAF. Canadians were asked to rate their perception of a number of different careers (e.g. government, media, armed forces) and specific questions about issues facing CAF serving and ex-service members (for example, mental health diagnoses, unemployment, homelessness and incarceration). Demographic data were also collected.

Results: Overall, 60% of respondents had a favourable opinion of the CAF, and 65% had a very favourable or favourable opinion of Canadian soldiers. Public opinion of the Canadian military was slightly lower than of fire fighters and it was viewed more favourably than the government, media, police force, banks and trades. The majority of Canadians believed common mental disorders (71%) and suicide (65%) were more common in the CAF than the civilian population, while half of thought high risk drinking was more common in the CAF than in the civilian population. One third of the Canadian general population believed unemployment and homelessness rates were similar in ex-serving members to the general population, and 45% though incarceration rates were lower.

Conclusion: Although the majority of Canadians surveyed had a positive opinion of the CAF, many Canadians believe CAF members to be at higher risk for many negative health outcomes than the civilian population and at increased risk for a difficult transition to civilian life after serving. While CAF members do experience increased rates of major depression and generalized anxiety disorder than the general population, they have similar or lower rates of alcohol dependence or abuse, suicide and ex-serving members have similar rates of unemployment, homelessness and incarceration to the Canadian population. It will be important to understand why Canadians believe the CAF experience negative life events.

P152: Veterans of the Reserve Force: Life After Service Studies 2013

*VanTil, L., MSc; MacLean, MB., MA; Poirier, A.; *McKinnon, K.; Pedlar, D., PhD*

Veterans Affairs Canada

Introduction: The Life After Service Studies (LASS) program of research is designed to enhance understanding of the transition from military to civilian life and ultimately improve the health of Veterans in Canada.

Methodology: This report uses the LASS data for Primary Reserve Force Veterans (n = 33,695) who released between January 2003 and August 2012. Reserve Force Veterans were described in 5 groups:

1. Class A service only (no periods of Class B or C service).

2. Release at entry rank of recruit or cadet (any class).

3. Class A service with periods of Class B service totalling less than 3.5 years.

4. Full-time service (periods of Class C service or more than 3.5 years of Class B service).

5. Periods of service in both Regular and Reserve Forces.

Results:

1. 26% were in Group 1. Their average age of release was 23.

2. 17% were in Group 2. They had predominantly Class A service and released at an average age of 24 at an entry rank. In 2013: 21% had low income, 5% were unemployed, 94% were satisfied with life and 8% had a difficult adjustment to civilian life.

3. 31% were in Group 3. They released at an average age of 26 and 89% released as Junior NCMs. In 2013: 12% had low income, 6% were unemployed, 94% were satisfied with life and 11% had a difficult adjustment to civilian life.

4. 12% were in Group 4. 84% had full-time Class C service and the average age at release was 37. In 2013: 10% had low income, 4% were unemployed, 90% were satisfied with life and 27% had a difficult adjustment to civilian life.

5. 14% were in Group 5. They released at an average age of 47 and 58% had a full career of 20+ years. In 2013: 6% had low income, 5% were unemployed, 88% were satisfied with life and 34% had a difficult adjustment to civilian life.

Conclusion: Reserve Force Veterans had a spectrum of military service and most adjusted well to civilian life. Veterans with Regular and Reserve Force service had characteristics similar to Regular Force Veterans. Part-time Reserve Force Veterans had characteristics similar to Canadians. Full-time Reserve Force Veterans had characteristics between part-time and Regular Force Veterans.

P153: Test Your Transition IQ

Poirier, A.; Keough, J., BPR

Veterans Affairs Canada

Introduction: The Life After Service Studies (LASS) program of research is designed to further understand 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, and Statistics Canada. Many insights have emerged from these studies. This poster will test your knowledge about the well-being of Canadian Veterans after release.

Methodology: The study population is Canadian Veterans, defined as former Canadian Armed Forces (Regular or Reserve) personnel, regardless of their length of service and regardless of their status as VAC clients. Data comes from the two cycles of LASS that have been completed. LASS 2010 included a survey of health and well-being and a record linkage for pre- and post-release income trends of Regular Force members released from 1998 to 2007. It also included a mortality study of both still-serving and released military personnel enrolled between 1972 and 2007. LASS 2013 built on the earlier studies from 2010 by including Veterans of the Primary Reserves in two major studies: a survey and income study covering releases up to 2012. The surveys were computer-assisted telephone interviews conducted by Statistics Canada with a representative sample of the population frames with content from the Canadian Community Health Survey for comparisons to the general Canadian population. The Income Study was a database linkage to tax files.

Results: Findings from these studies will be presented in true or false statements for participants to select a response. The aim of this interactive poster is to create a dialogue around important insights into the Canadian Veteran population. Topics will include mortality, employment, mental and physical health, gender, reserves, homelessness, demographics and adjustment to civilian life.

Conclusion: LASS is a vital resource to provide evidence for improvements to programs, benefits, communications and outreach with other stakeholders, ultimately improving the health and well-being of Veterans in Canada.

P154: Development and Cognitive Testing of the Road to Civilian Life (R2CL) Transition Checklist for Self-Assessment of Need to Access Support Services

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Introduction: Military to civilian transition (MCT) can be one of the most stressful of life transitions for many military personnel. There is emerging evidence that experiences during the peri-release MCT period can impact well-being for members and their families during MCT and later in life. Qualitative studies have suggested that military members are caught unaware by the challenges of MCT and might not seek assistance from transition support programs offered by governmental and non-governmental agencies until they are already in difficulty. Self-assessment tools are widely used in career counselling, business, education, professions and health care to prompt individuals to reflect on their situations and take action. A self-assessment tool as developed as part of the *Road to Civilian Life* (R2CL) program of research.

Methodology: Using expert consensus, literature review and risk indicator findings from the *Life After Service Studies*, we identified two items intended to prompt self-assessment in each of six key domains of well-being in MCT: employment/meaningful activity, finances, physical and mental health, social integration/support, life skills, and housing. We drafted graphic prototypes of the self-assessment tool in English and French, one for serving members and another for Veter-

ans (former members) and then conducted two rounds of cognitive interviews plus evaluation of visual presentation and utility, making adjustments in between.

Results: The content and visual design of the self-assessment checklist was well received by study participants during the initial interviews. Minor adjustments were required after the first and second rounds of interviews. None of the interviewees identified important risk indicators not covered by the items and all of them thought that the tool should be made available to both serving and former members. Visual presentation was acceptable, and potential utility was thought to be high.

Conclusion: The R2CL Transition Checklist should promote reflection and self-assessment in serving members and Veterans to assist them in determining whether they should seek support services to optimize well-being of themselves and their families during MCT. Further work is being undertaken to determine how best to deploy the Checklist. Additional research is being planned to further assess the validity of the items and extending them to active screening tools.

P155: Transforming Post Traumatic Stress into Post Traumatic Growth - A Report on the First Canadian SPARTA Project Trial.

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Brief Description: Brief Description: Transforming Post Traumatic Stress into Post Traumatic Growth involves amongst others, finding acceptance and meaning in one's experience and learning to embrace vulnerability. This is especially true when the trauma has resulted in a moral injury. Many patients with PTSD struggle to contextualize the trauma that led to the moral injury. Project Trauma support has initiated a novel program using residential, peer based experiential exploration and learning conducted over 5 1/2 days based on the American SPARTA program. The program incorporates meditation, equine mediated mindfulness, high ropes, adventure training and elements of mythology from familiar literary works. The ultimate aim is to facilitate participants in the re-establishment of trust and connection, to minimize social isolation, and to promote life-long healthy practices.

Clinical Outcomes: Online and paper surveys were administered pre and post intervention. This project explores the participants' pre, during and post-course psychosocial functioning and wellbeing, based on a series of self-report surveys and daily personal journaling narratives. Preliminary results suggest that the Project Trauma Support program may be an effective, affordable alternative to more prolonged interventions for certain military personnel and veterans with Post Traumatic Stress injuries. Results from the first cohort will be discussed and the program described in detail.

Patient Population: First Responders, Police, Firefighters, Active serving military and veterans.

Conclusion: The first cohort of project trauma support (PTS) took place between May 8-13 2016 in Perth ON. Preliminary analysis and feedback of participant psychometric surveys indicates a very positive effect, the details of which will be discussed.

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