FORUM 2018 Regina

ABSTRACTS 2018
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FAMILIES

HEALTH POLICY

Podium Presentations

1E01: Definitions of Military Families in Mental Health Research

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Introduction: Traditional ideas of the military family have centered on a husband, wife, and their children. With changing social norms regarding blended families, childless couples, unmarried and same-sex relationships, such definitions may no longer be as applicable to todays' families. However, it is not known how or if research of military families is keeping pace with these changes and reflecting the diversity within military families. A systematic review was conducted to understand how the 'military family' is defined in the context of mental health research.

Methodology: A systematic literature search of the peer-reviewed databases Ovid MEDLINE, Ovid Embase, Ovid PsycINFO, Ebsco CINAHL and ProQuest PILOTS was conducted using database specific headings and text searches for 'military', 'family', including 'spouses', 'children', 'adolescents' and 'mental health' (depression, posttraumatic stress disorder, alcohol misuse, anxiety, psychological stress). Reference lists of all eligible reports and articles were hand-searched to identify any additional studies. Search results were limited to peer-reviewed studies with publication dates from 2002 to present to retrieve research from the post-9/11 era. No restrictions were placed on Service branch or serving status.

Results: 96 papers were retrieved from the search, of which 80% were based on US research. 43 papers focused on the mental health of spouses of military/veteran personnel, 28 on children/adolescents from military/veteran families and 16 examined intergenerational between children and parents or health outcomes in couples. 9 papers included other family members (i.e. parents), although these largely focused on the provision of caregiving for injured veterans.

Most families included in the review studies reflected traditional, heteronormative ideas of family, comprised of male military personnel married to female civilians with which they have children. Many 'non-traditional' families were not represented in the research, such as non-married couples, male spouses/partners, same-sex families, dual-serving families and single parents, either because of the recruitment methods used or they were explicitly excluded from participating.

Conclusion: This review suggests that recent research on mental health in military families has taken a narrow approach to defining military families. Continuing to reflect traditional, heteronormative idea of military families in research explicitly and implicitly excludes certain groups from involvement in research studies and therefore from understanding the unique influences on their health and well-being. Future studies should attempt novel recruitment methods to ensure the diversity of military families is reflected in research.

Poster Presentations

P174: "Military family" in Policy: Comparing definitions across the United States, United Kingdom, Canada, and Australia

*Cramm, Heidi, PhD[1]; Fear, Nicola, DPhil[2]; Gribble, Rachael, PhD[2]; Mahar, Alyson, PhD[3]; Muir, Stewart, PhD[4]; Godfrey, Kelli, MSW[5]; Albright, David, PhD[5]; Daraganova, Galina, PhD[4]; Spinks, Nora, [6]

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Introduction: To ensure military family research is applicable to modern military families, clarifying how the family as an institution is implicitly and explicitly constructed through the definitions contained within policies relating to military families and the military charity sector is foundational.

The purpose of this review was to identify definitions of military and veteran families supported and operationalized by governments globally.

Methodology: We performed a search of online, publicly available government websites and documents in four countries: the United Kingdom, the United States, Australia and Canada between July 18, 2017 and September 18, 2018. We targeted the following branches of government: veteran affairs, defence, health, welfare and education. We performed a search of selected charitable organization websites for each country. After preliminary analysis, clarifications were included from representatives from each country.

Where available, we extracted a definition of a military or veteran family for each government sector from federal and national policies, specific policies, or programs provided to military or veteran families from charitable organizations.

Results: Publicly available definitions of military families mentioned in health, education, and social welfare policies and the charitable sectors of the United Kingdom, United States, Australia and Canada were reviewed. Of the four countries compared in this report, only the US Department of Defense provides a general definition of both a "military" and a "veteran" family. The remainder define or allude to a definition of military or veteran families via policy related to access to benefits or services for those within the military community.

Conclusion: Most policy definitions focus on spouses, partners, and children, with some variation across countries:

- The US and UK had the most limited definitions of military/veteran families, constraining their definitions of spouse/partner to married couple relationships. In contrast, Australian and Canadian definitions include married couples as well as those in co-habiting (*de facto*) relationships.
- All countries include biological, adopted, and step-children, provided they are dependent on personnel.
- There were differences in the age at which children were judged to be dependent, with eligibility for different services varying by age. All countries include extensions for children attending university or higher education and those with mental or physical disabilities.
- All countries include parents and other relatives such as aunts and uncles, provided they are dependent on personnel.

- Charity definitions were more inclusive than government definitions, including support and information services for immediate family members as well as parents, siblings, and careers.

HEALTH SERVICES

Podium Presentations

1E02: Delivering Health Care to Children and Youth in Military Families: Current knowledge and needs of Canadian paediatricians

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Introduction: Many healthcare professionals and policy-makers are unaware that military families are provided healthcare through the provincial system, and are unfamiliar with their unique healthcare challenges. This work sought to document the knowledge, experience, and professional development needs of Canadian paediatricians in the care of children and youth in military-connected families.

Methodology: A one-time, nationally targeted survey of Canadian paediatricians was completed. Survey questions were focused in four areas: knowledge of Canadian Armed Forces families, how membership in a military family affects care, confidence in providing care to this population, and training or educational needs. Descriptive statistics are reported.

Results: Of the 2,799 participants who received the survey, 764 (27%) responded. One third of respondents incorrectly believed that the federal military healthcare system provides services to children/youth in military families, and half were unsure. Almost one quarter did not believe that identifying a child/youth as part of a military family informed patient care, while a minority believed it warranted further specific social or health history screening. Over half felt inadequately prepared to care for children/youth in military families. There was strong evidence that additional resources, information, or training would benefit the care of military families, including a better understanding of risks and the services available to military families.

Conclusion: The majority of Canadian paediatricians are unaware that children and youth in military families receive provincial/territorial healthcare, or whether or not they provide health care to children and youth in military families. The majority of paediatricians have not received any special training or education on caring for military families. These data provide clear evidence of a need to further military literacy amongst healthcare professionals, and provide clear direction for the development of enhanced resources and supports within the healthcare system.

1E03: Healthcare Providers and Culturally Competent Care for Canadian Military and Veteran Families

*Tam-Seto, Linna, PhD[1]; Cramm, Heidi, PhD[1]; Krupa, Terry, PhD[1]; Lingley-Pottie, Patricia, PhD[2]; Stuart, Heather, PhD[1]; Aiken, Alice, PhD[3]

[1]Queen's University; [2]Strongest Families Institute; [3]Dalhousie University

Introduction: In healthcare systems, there is increasing attention for the need for cultural competency when working with diverse populations. Military and veteran families (MVF) are viewed as a unique population characterized by military culture and their shared experiences of mobility, separation, and risk. Unlike their American counterparts, military families in Canada access the civilian healthcare system, and are likely being cared for by health professionals unaware of military culture and impacts of military family life on their health and well-being. At this time, there is little information known about the healthcare experiences of Canadian military and Veteran families, including the experiences of those who provide their care. This study sought to answer the question: "What are the experiences of culturally competent healthcare providers working with Canadian military and veteran families?"

Methodology: This current study is the second phase of a multi-phase study aimed at developing a cultural competency model. This study involved in-depth, one-on-one qualitative interviews with healthcare providers who have indicated experience working with military and veteran families. Healthcare providers were asked to describe and reflect on their experiences working with military and Veteran families. Framework analysis was used to identify cultural competencies from the perspective of the healthcare providers.

Results: Nine interviews were conducted with a range of healthcare professions including: nursing, occupational therapy, psychiatry, paediatrics, and social work. Participants identified the importance of understanding how frequent relocation affects health service access and overall well-being of MVFs. Participants described strategies used to enhance their knowledge base of MVFs due to the lack of resources in their own formal education. When appropriate and possible, healthcare providers were creative with their evaluations and interventions to help address access and continuity of care challenges. Participants also expressed the importance for health professionals to advocate and support MVFs and for their health associations to provide resources and education to ensure that providers are equipped to care for this population.

Conclusion: This study begins to understand the experiences of healthcare providers caring for MVFs in Canada and identifies specific competences that enhance the healthcare relationship. The results of this study will be integrated with previous data from interviews with MVFs to inform the development of a cultural competency model for health care providers. This study will also contribute to the growing body of knowledge on the healthcare experiences of Canadian MVFs.

1E04: Military and Veteran Family Cultural Competency Model: A framework for health care providers

*Tam-Seto, Linna, PhD[1]; Cramm, Heidi, PhD[1]; Krupa, Terry, PhD[1]; Lingley-Pottie, Patricia, PhD[2]; Stuart, Heather, PhD[1]; Aiken, Alice, PhD[3]

[1]Queen's University; [2]Strongest Families Institute; [3]Dalhousie University

Introduction: Military and veteran families are a part of the Canadian military culture as a result of shared family life experiences including frequent relocations, regular separation from military loved ones due to training or deployment, and living with persistent risk of injury or death of their family member. These unique conditions may impact the overall health and well-being of military and veteran family members, which can be exacerbated by stressors related to accessing and navigating health care systems. Unbeknownst to most Canadians, military and veteran families receive services through the civilian health care system, which may not adequately meet their needs due to limited understanding of how the realities of military service impacts fam-

ily life. Although health professional associations have recognized this limitation, there is currently no cultural competency model that can be used to support healthcare providers working with military and veteran families in Canada. This research was structured to answer the question: "What are the cultural competencies required of healthcare providers when working with Canadian military and veteran families?"

Methodology: A multi-phase, qualitative study was completed. Phase I: A scoping review was completed of the healthcare literature to determine similarities across competency models and frameworks. Phase II: A competency model was developed using two sets of 1:1 interviews using Critical Incident Technique conducted with military members, veterans, and their families and with health care providers with experience working with military and veteran families. Framework Analysis was used for data analysis. Phase III: Validation study was completed using focus groups and 1:1 interviews with military subject matter experts and civilian health care providers using a systems theory-informed qualitative approach.

Results: This multi-phase competency development study produced the Military and Veteran Family Cultural Competency Model that includes a pictorial depiction of cultural competency for health care providers working with military and veteran families. The study also produced a framework that articulates specific cultural competencies for each of the cultural competency domains, awareness, sensitivity, knowledge, and skills.

Conclusion: This model representing the cultural competencies for health care providers working with Canadian military and veteran families can be used to inform education, practice, and policies. This study is an important contribution to the growing body of research to increase our understanding of the unique access experiences of military and veteran families.

PRIMARILY MENTAL HEALTH & WELL–BEING

Podium Presentations

2E01: Examining the Relationship between Parent Mental Health and Children's Academic Performance in Canadian Military Families

Stelnicki, Andrea, MSc, PhD (Cand); Schwartz, Kelly Dean, PhD

University of Calgary

Introduction: Children of military families face challenges not experienced by most students, including extended parental absences and frequent relocations. Previous research on how relocation affects grades and standardized test scores has produced mixed results (Hemenway, 2016; Lyle, 2006; Marchant & Medway, 1987). Parental deployment, more specifically, appears to have negative impacts on grades (Engel, Gallagher, & Lyle, 2010; Phelps, Dunham, & Lyons, 2010), particularly as deployment length is increased (Engel et al., 2010; Nicosia, Wong, Shier, Masachi, & Datar, 2017; Richardson et al., 2011). Less work has been published regarding the impact that the mental health of the service member parent has on the child's engagement and achievement at school. When a student's at-home parent has more social support, Hiew (1992) found children to have less acting-out behaviours, learning problems, and academic under-achievement during deployment. Therefore, it is important that the impact of parental mental health, both of the member parent and

the spouse, is investigated in relation to children's school performance. The purpose of this study is to examine the relationship between parental self-reported mental health symptoms (i.e., depression, anxiety, substance use, and PTSD) and indicators of children's academic performance.

Methodology: Military families were recruited as part of a larger study. Children (aged 8-18) completed online questionnaires about their school engagement and academic self-efficacy. Parents (members and spouses) completed surveys about their mental health (i.e., depression, anxiety, PTSD, and substance use) and their children's academic performance.

Results: Preliminary results suggest that academic performance is more affected by the member parent's mental health symptomology than the spouse's mental health self-report. Further analysis is required.

Conclusion: Questions still remain as to how parents' mental health symptomology impacts children's performance at school. Nonetheless, it is an important area to continue studying. School engagement is an important component to consider in military-connected student research. Schools are in an ideal position to target and intervene when children are at-risk of poor academic performance.

2E03: How Military Life Impacts Academic Indicators for Military-connected Children

Stelnicki, Andrea, PhD (Cand); Schwartz, Kelly Dean, PhD

University of Calgary

Introduction: Children from military families experience an average of six school changes between kindergarten and high school graduation (Bradshaw et al., 2010). It is estimated it can take a student up to six months to adjust to their new academic environment (Weisman, 2012). Highly mobile military-connected students face potential repercussions to not only their academic performance, but their engagement with their new school environment, social connections, and school and community activities (Cramm & Tam-Seto, 2018). The purpose of this exploratory study was to better understand indicators of academic performance (i.e., school engagement, academic self-efficacy, parent report of achievement and participation in activities) of Canadian military-connected students.

Methodology: Military families were recruited as part of a larger study. Children ages 8-18 completed a survey that included indicators academic performance, including school engagement and academic self-efficacy. Their parents completed a survey that included questions about their academic achievement (i.e., an estimate of their grades) and participation in activities.

Results: Overall, many children in this sample report positive academic indicators. Early analysis show that high self-reports of academic self-efficacy and school engagement are positively related to academic performance and engagement with extra-curricular activities.

Conclusion: The results of this study provide further support for the importance of identifying and providing support for military-connected youth in during and after school transitions. School personnel should consider children of military families as vulnerable populations and help to facilitate smooth transitions after relocation.

3E02: The Health and Well-being of Young People from UK Naval Families during Non-deployment Related Family Separations

Gribble, Rachael, PhD; Fear, Nicola. T, PhD

King's College London

Introduction: Life in the UK Armed Forces involves frequent separations due to extensive training missions and deployments. Such experiences are part and parcel of life in the Services but can be the cause of stress and poor well-being among Service personnel and their family members. Naval (Royal Navy and Royal Marine) families experience different patterns of family life and separation from personnel in other Service branches; 36% of UK Naval families report living separately from Service personnel during the working week compared to 24% of UK Armed Forces families overall (Ministry of Defence 2016). With much of the previous literature focused on the deployment-related experiences of Army personnel and their spouses, little is known about how these particular types of separations might influence the health and well-being of young people within these families.

Methodology: This study explores experiences of family functioning among young people from UK Naval families during non-operational family separations and the perceived influences on health and well-being. Focus groups (two groups, n=6-8 participants) will be conducted with young people from Naval families and will explore their perceptions of family dynamics, relationships, communication and well-being. Data will be analysed using Framework analysis.

Results: Data will be collected in April 2018. Findings from young people will be compared and contrasted with those from a similar study of spouses of Naval personnel to highlight similarities and discrepancies in perceptions of family functioning and well-being during non-operational family separations.

Conclusion: Data will be collected in April 2018. Findings from young people will be compared and contrasted with those from a similar study of spouses of Naval personnel to highlight similarities and discrepancies in perceptions of family functioning and well-being during non-operational family separations.

3E03: Assessing the Needs of Canadian Armed Forces Communities

Manser, Lynda, 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. In order to be responsive to Canadian Armed Forces (CAF) members and their families and to assist Base/Wing Commanders in determining the unique needs of their community, a new comprehensive CAF community needs assessment (CNA) tool was implemented in fall 2016 based on externally validated measures.

Methodology: The CAF CNA was an online survey completed by military community members with questions focused around seven main components:

1. Context (e.g. location, demographics).

2. What have respondents experienced as problems? The framework captures experiences across nine 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: Over 11,000 respondents completed the CAF over the course of one month. Respondents included Regular Force members, Reservists, Spouses, Veterans, Parents of single serving members and DND/NPF civilian employees.

The CAF CNA provides a national picture of the current trends in emerging unmet needs within the military community as a whole, as well as base/wing analysis that show what is needed to better serve individual military communities.

Conclusion: The new CAF CNA tool links the most pressing problems of military families to their self-defined needs. Then, within that context, it allowed for the direct comparison between service usage and satisfaction with family perceptions of how their needs have been addressed. Through the new CAF CNA tool, CAF members have the opportunity for active and meaningful participation in the development, delivery and evaluation of their morale and welfare programs and services.

3E04: Army Partners: The perspectives and experiences of accessing formal and informal support

Long, Emma, PhD (Cand)

Lancaster University, UK

Introduction: I will outline some of the key findings of an ongoing PhD project (to be submitted September 2018) exploring UK army partners' experiences of accessing both formal and informal support mechanisms. Formal support refers to the support available from the Unit Welfare Officer, Army Welfare Service, and other related organizations. Informal support refers to the voluntary support received from family, friends, colleagues and neighbours. Specifically, I will show how army partners assess the value and negotiate support pathways made available either by formal support or social networks. Previous research has shown that army partners prefer to seek support from informal networks, whilst my research extends this by assessing why this is the case.

Methodology: I will present the views gained from 27 in-depth semi-structured interviews with partners of currently serving army personnel residing in the United Kingdom. I will also refer to the viewpoints offered by 23 military-related support staff including Unit Wel-

fare Officers, members of the Army Welfare Service, and the Army Families Federation. Each interview lasted approximately an hour. Data was transcribed and analysed thematically.

Results: The key criteria that impact army partners likelihood to seek formal support includes their perspective of their role as a military partner, the trustworthiness of the military or organization offering support, the nature of the problem, quality of the support available, and access to support spaces. Each of these are impacted by the stigma attributed to help-seeking that is accentuated within the military community due to a fear of being branded a 'welfare case' in a close-knit community.

Conclusion: These research findings are useful for those working in military family-oriented support as it identifies why some do not choose formal services as an avenue for managing military-related stress.

3E05: Perceptions of Family Functioning and Well-being among UK Naval Spouses during Non-operational Family Separations

Gribble, Rachael, PhD; Fear, Nicola. T, PhD

King's College London

Introduction: Life in the UK Armed Forces involves frequent separations due to extensive training missions and deployments. Such experiences are part and parcel of life in the Services but can be the cause of stress and poor well-being among Service personnel and their family members. Naval (Royal Navy and Royal Marine) families experience different patterns of family life and separation from personnel in other Service branches; 36% of UK Naval families report living separately from Service personnel during the working week compared to 24% of UK Armed Forces families overall (Ministry of Defence 2016). With much of the previous literature focused on the deployment-related experiences of Army personnel and their families, little is known about how these particular types of separations might influence the health and well-being of military spouses.

Methodology: This study explores experiences of family functioning among UK Naval spouses during non-operational family separations and the perceived influences on health and well-being. 20 telephone interviews were conducted with female spouses of UK Naval personnel. Data was analysed using Framework analysis.

Results: Spouses described how non-deployment related separations limited time as a family time, causing problems in family functioning, communication and relationships. Though many families chose to separate to provide stability for spouse employment, as well as child education, participants described issues managing working life alongside family responsibilities and experienced limitations to their career as a result of these challenges. Poor mental health and well-being was attributed by spouses to difficulties coping with managing as a single parent and physical health could be affected because of the limited time participants had for exercise. Children were also reported to find separations difficult, although this varied according to the age of the child. Rapid changes in family roles could result in tension with older children. A number of resources were described as helping or hindering spouses and family adapt to these separations, with social networks, finances, employers and Naval support all important factors.

Conclusion: These findings highlight the difficulties that military families can experience during shorter-term family separations, many of which are similar to challenges during deployment. With proposed changes to military housing provision in the UK, such experiences may become more wide spread across all Service branches as more personnel live away during the week and should be considered as one of the potential implications of this change.

4E03: Development of a Model of Well-being for Children from Military Families in NATO Countries (3 of 5)

*Hawkshaw, Rita, MSc[1]; Markson, Hannah, MSc[1]; *Skomorovsky, Alla, PhD[2]*

[1]UK Ministry of Defence; [2]Department of National Defence

Introduction: Review of existing models of child well-being has demonstrated a considerable gap for the well-being model of children from military families. One of the objectives of the NATO HFM-258 group was to develop a multi-dimensional model of child well-being to reflect different dimensions of child well-being that simultaneously takes into account military factors.

Methodology: The development of the child well-being model comprised of seven phases: 1) review of the participating NATO countries' literature; 2) outline of the key elements of a model of child well-being; 3) identification of potential indicators; 4) identification of the components and dimensions; 5) review and the refinement of the model; 6) inclusion of the military factors which influence child well-being; and 7) development of the definition of child well-being. Thematic analysis was used to identify the well-being indicators, dimensions and components.

Results: The key elements of the model of child well-being were: child well-being as a multidimensional construct, potential indicators which could measure the dimensions of child well-being, components which grouped together the indicators, and the application of a military lens. Initially, 42 potential indicators were identified from the NATO members' literature. Twenty-two components were identified from the indicators using thematic analysis. These components were grouped into five dimensions of child well-being – Health, Education, Legal, Material and Social (HELMS); this led to the HELMS model of child well-being. The application of the military lens resulted in the Military HELMS model of child well-being.

Conclusion: The close alignment of the HELMS model with the well-established Bronfenbrenner's bioecological model, Minkkinen's structural model and the OCED measures of child well-being demonstrated a degree of content validity. The final description of the HELMS dimensions reflected the well-being indicators and components from the thematic analysis of the literature identified by the NATO countries. The review of the military literature indicated that military factors may either moderate other factors or have a direct impact on the well-being dimensions and components. Hence, the HELMS model could be viewed using a military lens to explore the well-being of children from military families; resulting in the Military HELMS model of child well-being. The development of a common definition of child well-being was the final stage to ensure consistency with any future work in this area.

5C01: Enhancing Cognitive Performance in Military Members, Veterans and First Responders with Mental Health Difficulties

McKinnon, Margaret, PhD[1]; Boyd, Jenna, PhD (Cand)[1]; Protopopescu, Alina, BSc[1]; O'Connor, Charlene, MSc[2]; Jetly, Rakesh, MD[3]; Rhind, Shawn, PhD[3]; Nazarov, Anthony, PhD[3]; Lanius, Ruth, MD[4]

[1]McMaster University; [2]Homewood Research Institute; [3]Department of National Defence; [4]Western University

Introduction: Results from recent meta-analyses point toward cogni-

tive impairments in mood and anxiety disorders, including post-traumatic stress disorder and depression. Despite these impairments, little work has focused on structured treatment approaches aimed at improving cognitive performance in these populations.

Methodology: Here, we assessed the efficacy of a standardized cognitive remediation program, Goal Management Training (GMT) in military members, veterans, and first responders undergoing inpatient treatment for PTSD. A separate randomized control trial (RCT) was conducted in patients with depression. Cognitive performance, functioning (e.g., family, work), and symptoms of depression and PTSD were assessed at baseline and immediately post treatment.

Results: Whereas GMT group participants in the depression RCT showed significant improvement on measures of social and family functioning, depressive and anxiety symptoms, verbal learning, working memory, and processing speed, no such gains were observed in the wait-list group. GMT group participants in the PTSD study improved on measures of processing speed, verbal memory, and rule learning. The GMT group also demonstrated significant improvements on measures of emotion regulation and intrusion symptoms while a treatment as usual group did not.

Conclusion: The results of these investigations point towards GMT as a promising approach to improving cognitive functioning in military members, veterans and first responders. Critically, these treatment gains were associated with improvements in symptoms of PTSD and of depression, and with improved functioning in key domains, such as work and family life. It is anticipated that GMT will lead to significant reductions in disease burden for military members, veterans, and first responders with PTSD.

5E01: Mental Health of Canadian Children Growing Up in Military Families: A qualitative study examining the perspective of service providers

Cramm, Heidi, PhD[1]; Khalid-Khan, Sarosh, MD[2]; Reddy, Pappu, MD[2]; Groll, Dianne, PhD[1]; Williams, Ashley, PhD (Cand)[1]; Ruhland, Lucia, MSc[1]

[1]Queen's University; [2]Hotel Dieu Hospital

Introduction: Children growing up in Military-connected families relocate more frequently, are separated from their parent(s), and live with the risk of parental injury. American research suggests these stressors may result in increased mental health issues. However, the Canadian context, where families of military members access provincial health services, has been understudied. This qualitative study explores the perspective of service providers mental health issues and needs of Canadian military-connected children.

Methodology: Purposive sampling was used to recruit a variety of service providers including healthcare professionals, educators, and others. Service providers participated in individual in-depth interviews that explored their perspectives on mental health concerns and health service access for Canadian military-connected children and youth.

Results: 12 service providers were interviewed, including 3 teachers, 5 physicians, 2 social workers, and 2 community service providers working with a local community agency. A preliminary review of the data indicates that providers felt there was an increased risk of mental health concerns for military-connected youth. In addition, there is a sense that access to healthcare and educational services can be difficult, particularly in the context of frequent relocations. Participants reported a need for increasing capacity within the health and education systems to serve military families more effectively.

Conclusion: This study describes the service provider perspective on mental health issues and needs on Canadian military-connected children. It creates the basis for understanding the mental health issues and service access needs of Canadian military families from the perspective of those who provide mental health services. We interviewed 12 providers from various professions and most participants reported that military-connected children may be at an increased risk for mental health concern and navigating healthcare and education services can be challenging for military families. These results have implications for health care and other service providers working with military-connected children and their families.

5E02: Mental Health of Canadian Children Growing Up in Military Families: A qualitative study - Child perspective

Cramm, Heidi, PhD[1]; Khalid-Khan, Sarosh, MD[2]; Groll, Dianne, PhD[1]; Reddy, Pappu, MD[2]; Williams, Ashley, PhD (Cand)[1]; Ruhland, Lucia, MSc[1]

[1]Queen's University; [2]Hotel Dieu Hospital

Introduction: Military-connected children face stressors including frequent moves, protracted parental separation, and risk of parental injury and American research suggests these stressors may increase mental health risk. Few studies examine the Canadian context, where families of military members access provincial health services. This study explores the child perspective on mental health issues and needs of Canadian military-connected children.

Methodology: In-depth qualitative interviews explored the mental health concerns and health service access for Canadian military-connected youth. Purposive sampling ensured a broad range of children from military families representing all Canadian Armed Service Elements and posting locations across Canada.

Results: 13 children between 7 and 18 years old (average: 12.4) in military families were interviewed. All Canadian Armed Forces service elements were represented. Children experienced an average of 3 moves (range: 0-6) and 1.5 conflict/disaster deployments (range: 0-3). Most participants reported that parental separation and having to leave friends when moving was difficult for them. Most participants reported that being part of a military family had positive and negative impacts on them and that resilience and vulnerability were dependent on multiple factors.

Conclusion: This work creates the basis for understanding the mental health issues and service access needs of Canadian military families. We interviewed 13 children from Canadian military families and most participants reported that parental separation and leaving friends was difficult but there were positive implications of being part of a military family as well. These results have implications for healthcare and other service providers working with military-connected children.

5E03: The Mental Health and Well-Being of Families of CAF Veterans with Operational Stress Injuries through the Military-to-civilian Transition: Implications for program and policy development

Norris, Deborah, PhD[1]; Cramm, Heidi, PhD[2]; Schwartz, Kelly, PhD[3]; Mahar, Alyson, PhD[4]; Tam-Seto, Linna, PhD[2]; Smith-Evans, Kimberley, MA[1]

[1]Mount Saint Vincent University; [2]Queen's University; [3]University of Calgary; [4]University of Manitoba

Introduction: This paper reports on the interventions and supports accessed through military-to-civilian transition (MCT) as a part of a comprehensive qualitative study focusing on the mental health and well-being of families of CAF Veterans living with mental health issues. Results previously presented from the overall study revealed an inter-dependent and bidirectional relationship between Veterans' mental health and the mental health and well-being of their family members, such that the imperative to care becomes the central, organizing facet of family experience.

Methodology: This study was informed by the interpretive/con-structivist paradigm and focused on the complex world of lived experience from the standpoints of those who live it. Sequential qualitative methods were employed. A convenience sample (27 English and French-speaking family members) was interviewed across Canada; Taking place across Western, Central, and Eastern Canada, 3 focus groups involving 9 family members were conducted. Interviews and focus groups were recorded and transcribed. Transcriptions were analyzed using grounded theory techniques with the assistance of MAX-QDA software.

Results: Family and friends constituted the main sources of informal support with social media facilitating knowledge exchange and community-building. Stigma, judgements from others, and discomfort discussing mental health issues impeded family members' capacity to access and benefit from social support from family and friends. Military-centric formal supports were highly valued, although, for some, access was affected by geographic and social isolation. As reported by participants, lack of information, eligibility requirements, complications in the coordination of administrative processes, inter-provincial variation in available programs and services, system navigation issues, and administrative delays constituted barriers to care, often causing and compounding gaps in service. Participants recommended enhanced and expanded services that acknowledge diversity in family form and function as well as the full spectrum of individuals involved in the Veteran's care. The significance of strategic engagement by families in the Veteran's care, the simplification of system navigation, changes to eligibility requirements and entitlements, and the implementation of a collaborative model were also noted.

Conclusion: This paper provides in-depth analysis of the formal and informal systems designed to address vulnerabilities, facilitate access, and maximize individual and family strengths for Veteran families living with mental health issues through MCT. The nature of the family's needs can evolve over time, suggesting a need to revisit what supports might be appropriate and useful at any given time. The role and structure of outreach to these families remains a priority for research, programming, and policy.

5E04: Canadian Secondary School Professionals' Awareness of the Needs of Military-connected Children

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Queen's University

Introduction: Twenty years ago, 80% of CAF families lived on military bases and sent their children to Department of National Defense (DND) schools. In the early 1990s, DND-funded schools were turned over to provincial school boards and the 64,000 military-connected children currently growing up in Canada attend local community schools. American literature indicates that the needs of military-connected children are often unaddressed in civilian schools because school professionals are generally unaware of or do not understand

the unique needs of military families. Given the differences in educational systems for military-connected children in Canada, it is unclear if these finding represent the Canadian experience. With virtually no Canadian research on the educational experience of military families, the purpose of this qualitative study was to explore how military-connected children and their unique needs are perceived by Canadian school professionals.

Methodology: This phenomenological study recruited current school professionals (teacher, guidance counsellor, administrator) at Canadian secondary schools who had experience working with military-connected students (n=6). All participants taught in Ontario secondary schools that had military bases within their catchment areas. Data was collected through semi-structured interviews that lasted between 25 to 45 minutes in length. A general inductive approach was used to analyze the data.

Results: Participants had a good understanding about the military lifestyle. Participants identified the following challenges associated with the military lifestyle: relationships, separation, stress, mobility, and identity. Participants lacked an overall awareness about how Ontarian secondary schools are currently addressing the needs of military-connected children. Five of the six participants were unaware if there are currently any formal mechanisms to identify military-connected children within schools. Instead, the participants discussed that military-connected children are often informally identified through visual cues, communication, and school assignments. Generally, participants recognized a need for professional development for school professionals to better recognize and address school issues for military-connected students, as well as a need for collaborations between the military and school boards.

Conclusion: This study begins to explore how Ontario secondary schools are currently addressing the needs of military-connected children. Administrators and policy-makers would benefit from information about military-connected children within classrooms and schools. Being able to make informed and educated decisions on whether to develop and fund things such as identification systems and professional development requires further study. Further research is needed to gain a better understanding of military-connected children and their needs within Canadian schools.

Poster Presentations

P172: The Association between Maternal Alcohol Misuse and Childhood Emotional and Behavioural Difficulties: A study of UK military families

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Introduction: Parental alcohol misuse is associated with higher rates of child emotional and behavioural difficulties. There are high levels of self-reported alcohol misuse in United Kingdom (UK) military personnel. To date, only one UK study has looked at alcohol outcomes among the spouses and partners of Service personnel and none have examined how maternal alcohol misuse may affect child outcomes.

Methodology: This is a secondary analysis of data collected from the 'Children of Military Fathers with PTSD' survey conducted among UK mil-

itary families. We recruited mothers from currently serving (regulars and reserves) or ex-serving fathers of children aged 3-16 years who participated in the study. Maternal alcohol misuse was measured with the Alcohol Use Disorders Identification Test (AUDIT). An AUDIT score of ≥8 was classified as alcohol misuse. Parental reports identified child emotional and behavioural difficulties using the Strengths and Difficulties Questionnaire: hyperactivity, emotional, conduct, and peer problems, prosocial and total difficulties. Multivariable logistic regressions were used, accounting for response weights and clustering, to examine associations between maternal alcohol misuse and child outcomes. Potential effect modification by child gender and paternal mental health was reported.

Results: This study included data on 574 children, from their 350 mothers who reported consuming alcohol in the last year. Of these, 57 mothers (weighted 17.6%) reported an AUDIT score ≥8; this represented 89 children. Overall, children of mothers who misused alcohol had significantly higher odds of conduct and social problems, and total difficulties compared to the children of mothers who did not misuse alcohol. Maternal alcohol misuse was associated with higher odds of hyperactivity, peer and social problems, and total difficulties for boys only and associated with higher odds of emotional problems for girls only. The negative effect of maternal alcohol misuse on conduct problems and prosocial difficulties was most pronounced in families where the father did not have PTSD or depression; in this group of children, maternal alcohol misuse was associated with higher odds of all child outcomes.

Conclusion: Maternal alcohol misuse negatively impacted on child emotional and behavioural outcomes in the UK military family setting, although there were differences by gender of the child. The impact of maternal misuse in military families with no mental health problems among fathers indicates the importance of focusing on the health and well-being of the family. Interventions from military and charity services should aim to reduce alcohol misuse among military spouses/partners to improve child outcomes in these families.

P173: Does Canadian Armed Forces Service Member Mental Well-being Contribute to Higher Substance Use among their Partners?

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University of Calgary

Introduction: Regular Forces members report twice the depression and anxiety rates as the general population (Pearson et al., 2014) and alcohol dependence rates higher than civilian populations (Park, 2008). Families of service members are at an increased risk for developing secondary stress or compassion fatigue that results in decreases to their own well-being. In fact, US research has suggested about 35% of military partners meet criteria for one or more mental health problems (Gorman, Blow, Ames & Reed, 2011). Less is known regarding the overall mental health profiles of military spouses in Canada. Interestingly, member mental health is enhanced by social support from their partners (Duax, Bohnert, Rauch, & Defever, 2014). Further, stress experienced by the at-home parent may affect parenting quality. Therefore, partner mental health requires investigation. The purpose of this study was to better understand how service members' self-reported mental health problems impacts the substance use behaviours (i.e., tobacco, alcohol, and drugs) of their partners.

Methodology: Military families were recruited as part of a larger study. Members and their partners completed an online survey and reported on their own symptoms of mental health (i.e., depression, anxiety, substance use and PTSD) using the Adult Self-Report (Achen-

bach & Rescorla, 2003) and the PTSD Checklist (Weathers et al., 2013).

Results: Preliminary results indicate that (contrary to what was expected) member mental health symptomology was not significantly related to their partners' overall substance use behaviours. However, members' self-report of substance use was significantly related to their partner's self-report of depression and anxiety symptoms. Further analysis is needed.

Conclusion: Although service member mental health does not appear to be significantly related to partner substance use, it is related to other aspects of partners' mental health. Further investigation is needed to better understand the relationship between member and partner mental health.

P175: Development, Evolution and Impact of a Workshop for Family Members of Canadian Armed Forces Members and Veterans with Operational Stress Injuries

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[1]St. Joseph's Health Care London; [2]Veterans Affairs Canada

Brief Description: Family members of Canadian Armed Forces (CAF) members and veterans with operational stress injuries (OSIs) often express sentiments ranging from frustration to hopelessness resulting from a failure to comprehend how to best support their loved one through the lengthy recovery process. Family members may report difficulty understanding and coping with changes to their loved one's personality or temperament; and the impact of these changes on interpersonal relationships and family dynamics. Further, family members frequently shoulder the challenge of maintaining a semblance of their previous "normal" family life in the absence of reliable supports while supporting their family member as they move along their pathway to recovery.

Clinical Outcomes: In an effort to help meet the unique needs of family members of CAF members and veterans with OSIs, family peer support coordinators from the Operational Stress Injury Social Support (OSISS) network partnered with clinicians from the Parkwood Institute Operational Stress Injury Clinic to develop the framework and content of a workshop to be delivered to interested family members of CAF members and veterans with OSIs. Workshop material was organized into the following areas: 1) psychoeducation around OSIs; 2) supporting treatment and roadblocks to recovery, 3) supporter role and tools for the toolbox, 4) possible effects on families, and 5) self-care. Workshops were jointly facilitated by an OSISS family peer support coordinator and an Operational Stress Injury Clinic clinician. Participants completed pre- and post-workshop evaluations and feedback was incorporated into content and formatting revisions for the next offering of the workshop. To date, two offerings of the workshop have occurred, and future offerings have been scheduled for the coming months. Preliminary feedback from participants has been overwhelmingly positive.

Patient Population: Workshop participants were family members of CAF members and veterans. Workshop facilitators were OSISS family peer support coordinators and Parkwood OSI Clinic clinicians.

Conclusion: There is a clearly identified need for psychoeducation and support for family members of CAF members and veterans with OSIs, and a workshop delivered jointly by OSISS family peer support coordinators and clinicians has demonstrated success in helping meet

these needs. Further iterations of workshop content will ensure that the identified needs of these individuals continue to be met.

P177: Parents of Canadian Armed Forces Members

Manser, Lynda, MMgt

Department of National Defence

Introduction: Military Family Services conducted two research studies in 2018, "Understanding the Needs of Parents of Canadian Armed Forces (CAF) Members", and "Understanding the Needs of CAF Members and their Spouses Who Care for Elderly Parents", to inform the development of the National Defence Policy Initiative "Comprehensive Military Family Plan". The objective was to better understand the unique situations of military families that are outside the traditional nuclear family.

Methodology: An online survey was developed based on an initial review of existing literature on the experiences of parents of CAF members, and also on the experiences of family members caring for an elderly parent. The survey on parents of CAF members focused on understanding their demographics, previous military service, how their child's CAF operational demands impacted their emotional well-being and stress level, what their coping mechanisms were and where they access support. The survey on CAF members caring for an elderly parent focused on understanding their demographics, the amount and types of caregiving activities they provided, how the caregiving demands impacted their family, finances, physical and emotional health, stress level, what their coping mechanisms were, and where they access support.

Results: In one month, over 500 surveys were completed by RegF members (30% and an additional 10% dual serving couples), civilian spouses of RegF members (40%) and parents of RegF members (15%). The average respondent was female (70%) between the ages of 25-44 (70%).

Parent respondents described their experiences on a variety of issues primarily related to the emotional impacts of having a child in the CAF. Most had mixed emotions – 70% experienced fear, worry and anxiety of their child's safety, while 97% also experienced positive emotions. Parents expressed frustration with the lack of information (50%), lack of connection (46%) and lack of communication particularly related to the occupational requirements and safety of their child.

CAF families caring for an elderly parent generally were providing support to manage finances, provide transportation, and helping with medical treatments. The majority of respondents felt their own health (physical, 65%; emotional, 72%) suffered as a result of providing care. Just over half felt they know how to deal with the extra stress added to their lives because of caregiving.

Conclusion: Families are changing and their needs are different. Through the voices of 500 RegF members, spouses and parents, we now better understand the experiences of parents and those caring for elderly parents.

P178: The Lived Experience of First Responder Families: Risks of stress, mental illness, and familial conflict

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University of Calgary

Introduction: By vocation, first responders (e.g., medical and military personnel, police officers, paramedics, firefighters) are exposed to traumatic situations and are at heightened risk of developing mental disorders (e.g., posttraumatic stress disorder, depression; Garner et al., 2016). Most troubling, Tema Conter Memorial Trust (TEMA) reports that a total of 236 Canadian first responders have taken their own lives since 2014; 52 first responders have completed suicide to date in 2017 ("Tema", n.d.)**.** However, first responder families have been largely ignored in the mental health and family systems literature, particularly in Canadian families. Having a suicidal, traumatized, and highly stressed family member significantly impacts the other family members (Marks-Tarlow, 1999; Meaney-Pieroway, 2014; Pearson, 2015). The current literature review aims to investigate the effect of having first responder in the family on non-serving family members (i.e., job-related stress transmission).

Methodology: A literature review was conducted to explore job-related stress transmission on first responder family members. The articles included in this literature review were obtained through database including Pubmed and PsychInfo. Key words used in search for articles were first responders, effect on family members, and mental illness OR psychopathology OR mental disorder. Further articles were obtained from the reference lists of relevant articles that were already obtained.

Results: Family members (e.g., spouse, partner, other members like children) are directly affected by trauma experienced by first responders (e.g., secondary traumatization, interpersonal conflicts, high stress, poor parent-child relationship), supporting the job-related stress transmission to the family members (Regehr et al., 2005; Duarte et al., 2006; Agocs et al., 2014; Canfield, 2014; Karaffa et al., 2015). In particular, first responder spouses report trauma symptoms, heightened parental responsibilities, low parenting self-efficacy in meeting their children's basic needs, high stress related to safety, and negative impacts of occupation and finances (Canfield, 2014; Dekel, Solomon, & Bleich, 2004; Porter & Henriksen, 2016). Chronic traumatic symptoms and stress experienced by first responder spouses can also negatively affect parent-child relationship, heightening the risk for emotional and behavioural difficulties and even psychopathology in children (Canfield, 2014; Dekel & Monson, 2010).

Conclusion: First responder families are significantly affected by transmission of job-related stress that first responders experience, suffering with the serving first responders. Future study can aim to study, the presence of high stress related to being first responder spouses, and the effect of stress experienced by first responder spouses on the quality of parenting, children's emotional and relational skills, and quality of parent-child relationship.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

4E01: NATO HFM-258 Impact of Military Life on Children from Military Families (1 of 5)

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Introduction: Military lifestyle may influence children's ability to meet developmental milestones and increase their vulnerability to physical and mental health impairments. However, little is known about the well-being of children from military families, especially about how they cope with the demands of military life. It is, therefore, important to understand in more depth the impact of military life on well-being of children from military families and to recognize how multiple

systems contribute to children's responses to stressors, including their ability to adapt and the optimal support systems.

Methodology: To address this knowledge gap and understand experiences of children from military families, NATO HFM RTG-258, Impact of Military Life on Children from Military Families, was established in January 2015. Nineteen representatives from 12 countries participated in this task group. The key objectives were to: 1) identify key issues of the impact of military life on children from military families; 2) develop a universal framework for the well-being of children in military families and to operationalize the term well-being in this context; 3) identify programs available in participating nations and the impact of their legal and political contexts on child well-being; and 4) promote and serve as a forum for active collaboration.

Results: This presentation discusses the achievements, limitations, and practical implications of the outcomes of this international task group. Key achievements include: review of the key military factors impacting well-being of children from military families, development of the universal model of child well-being taking into account the military context, outline of the best practices for children in military families available across nations, and description of the best measures for child well-being research in the military context. Despite some methodological and conceptual limitations, the collaborative approach of this NATO group will assist the military organizations and the service providers to ensure that their programs are consistent with the needs of children from military families.

Conclusion: NATO HFM-258 results not only contribute to a greater understanding of the well-being of children from military families, but also have important practical implications for military organizations by outlining the best practices across nations. In addition, the child well-being model can benefit military organizations across nations by helping the service providers to ensure that their programs offered are consistent with the needs of children from military families.

4E02: Civilian Children Well-being: Providing the context for research on the well-being of military children (2 of 5)

Riviere, Lyndon, PhD

Walter Reed Army Institute of Research

Brief Description: Child well-being (CWB) is viewed as a priority within many nations and it has been widely studied among civilian children. This literature includes definitions of, and theories about CWB. Moreover, much of it has focused on the myriad factors that are associated with CWB. The knowledge produced and the gaps identified are critical for the emerging work on military children. This presentation summarizes a narrative review that was conducted as a part of the NATO HFM-258 working group on what is known about CWB in non-military children. Critical elements of CWB are outlined and existing theoretical perspectives are presented. Lastly, empirical findings on the key factors that influence CWB are highlighted and interpreted.

Outcomes: Literature searches were conducted in 2016 and 2017. The literature searches on the key factors that influence CWB were restricted to research/empirical studies and excluded articles about maltreatment, disorders, illnesses, or intervention, well-being surrounding particular life events such as divorce and adoption. They were also limited to those published between 1998 and 2017 in English.

Patient Population: Despite the substantial literature on the CWB, agreement on what it means appears elusive. Further, some definitions provide a useful starting point to understand and study this phenomenon, but others do not reflect the current consensus on the critical elements of CWB. In contrast, scant attention has been devoted to theory development, and most research appears to be atheoretical. The empirical literature has focused on factors at the parental, school and community levels, but less so on what actions children take that affects their well-being or on how the broader societal/cultural context affects CWB.

Conclusion: The lack of consensus on what is meant by CWB has not limited research; researchers seem to have (implicit or explicit) working definitions that influence their studies. However, CWB is often used as an umbrella term, usually concerned with subparts rather than reflecting a holistic understanding. This probably occurs because these studies do not utilize a theoretical framework. The non-use of a theoretical framework may reflect the paucity of CWB theories. Clearly, research on military children would benefit from a more comprehensive theoretical perspective that reflects the current understanding of what constitutes CWB and the numerous factors that influence it including the national context.

Poster Presentations

P179: Sleep Duration Misperception in Mild Traumatic Brain Injury: Preliminary results

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University of Toronto

Introduction: Emerging evidence suggests that short sleep is linked to dysfunction of restorative function, while long sleep is associated with increased cytokine levels and sickness behaviour. Mild traumatic brain injury (mTBI) may influence accurate assessment of sleep duration, and result in misperception, e.g., underestimation or overestimation of sleep time relative to objective measures. This study aimed to elucidate socio-demographic, brain-injury-related and clinically-important (comorbidity, substance and medication effect, etc.) factors underlying misperception in mTBI.

Methodology: The study, approved by hospital and university ethics boards, took place in a research-teaching hospital. Thirty-seven participants diagnosed with mTBI (57% male, 47.54± 11.3 years old, 547±1380 days post injury) underwent clinical and neuroimaging examinations, full-night PSG, and estimated their sleep duration in the morning following PSG.

Two outcomes of interest were tested in this study: (1) sleep duration by PSG and self-assessed, separately and (2) absolute differences between both measurements. We tested a priori defined variables within five categories, e.g., sociodemographic, brain injury-related, clinical, drug use effect, and psychosocial distress as covariates of two selected outcomes of interest.

Results: Mean self-assessed sleep duration was 342 ±93.6 minutes and PSG-assessed sleep duration was 382 ±76.8 minutes. Twenty-seven participants (73%) under-reported their sleep duration and ten participants (27%) over-reported it.

The two measures were moderately correlated (rho=0.46, p=0.004) between themselves. Of the hypothesized variables, age was significantly correlated with both self and PSG-assessed sleep duration (rho=0.34 and rho=0.84, respectively, p-values<0.05). Insomnia severity was uniquely associated with self-assessed sleep duration (rho=-

0.48, p=0.002). Presence of prior head injury and insomnia severity were highlighted as factors associated with the absolute difference between PSG- and self-assessed sleep duration.

Conclusion: Patients with mTBI do not accurately assess their sleep duration thus reinforcing the importance of an objective assessment of sleep. Specific analyses of patients who under-report and those who over-report will provide greater insight into the concept of sleep perception in mTBI and associated factors.

PUBLIC SAFETY PERSONNEL

PRIMARILY MENTAL HEALTH & WELL–BEING

Podium Presentations

1D02: Optimizing Success in the Return-to-work Process for First Responders

Lee, Vivien, PhD

WGM Psychological Services

Brief Description: There has been increasing recognition of the cumulative impact of responding to traumatic events throughout the course of a first responder's career (e.g., police officers, firefighters, paramedics, correctional officers, dispatchers), with several Canadian provinces having enacted presumptive legislation recognizing Post-traumatic Stress Disorder (PTSD) as a work-related injury. However, there has been little research into best practices in return-to-work (RTW) plans for first responders returning after a leave. There is also inconsistency between how different services implement RTW plans for their members returning to work.

One result of work-related PTSD is that stimuli that are a regular, everyday part of a first responder's duties can come to serve as trauma-related triggers for the individual first responder, despite years of working with these stimuli (e.g., sirens, lights, vehicles, uniforms, tones, hearing about traumatic calls). Thus, just like any other trauma-related trigger, it is important for first responders with trauma-related difficulties to have these triggers incorporated into not only their psychological treatment, but any RTW plan.

Prolonged exposure is an evidence-based treatment for PTSD that has been strongly recommended by the American Psychological Association (APA, 2017) in their Clinical Practice Guideline for the Treatment of PTSD. An important component of prolonged exposure involves graduated, systematic exposures to trauma-related triggers. From both theoretical and clinical perspectives, graduated RTW plans that incorporate such clinical exposures *within* the RTW process may optimize the success of not only returning to, but also *maintaining* a RTW in the long-term.

Outcomes: This presentation will provide a literature review and discuss clinical experiences in helping first responders return to work. Potential outcome variables for future study will be proposed; for example, days of disability leave, sick days, number of first responders returning to front-line duties or alternate employment, number of first responders sustaining a RTW over various time periods (e.g., three, six, nine, 12 months).

Patient Population: Target populations include: first responders (e.g., police officers, firefighters, paramedics, correctional officers, emergency dispatchers), occupational health staff, first responder employers, and clinicians who work with first responders.

Conclusion: Given the paucity of research into best practices for a successful RTW for first responders, a RTW process incorporating evidence-based prolonged exposure principles prior to and throughout a graduated RTW process will be proposed based on research and clinical experiences to maximize the likelihood of a successful RTW in the long-term.

1D03: Exposure to Mental Health Training and Mental Health Resilience, Knowledge and Stigma among Canadian Public Safety Personnel

Turner, Sarah, MSc[1]; Taillieu, Tammy, MSc[1]; Afifi, Tracie, PhD[1]; Carleton, R. Nicholas, PhD[2]; Vaughan, Adam, PhD[3]; Anderson, Greg, PhD[3]; Bailey, Suzanne, MSW[4]

[1]University of Manitoba; [2]University of Regina; [3]Justice Institute of British Columbia; [4]Canadian Armed Forces

Introduction: As a function of their profession, Public Safety Personnel (PSP) are often exposed to traumatic events that may compromise positive mental health status. Mental health training programs have been implemented among PSP professions to increase knowledge about mental health, reduce stigma towards mental health problems, and improve mental health resilience. However, very little research has evaluated the effectiveness of these programs in improving mental health outcomes. The objectives of this presentation are to: 1) estimate the prevalence of exposure to different mental health training programs among PSP in Canada and 2) determine the association between mental health training programs and mental health knowledge, stigma and resilience.

Methodology: Data were collected using a web-based survey collected from September 2016 to January 2017 by the Canadian Institute for Public Safety Research. Respondents were asked about their exposure to several mental health training programs including: 1) critical incident stress management, 2) critical incident stress debrief, 3) mental health first aid, 4) road to mental readiness (R2MR), and 5) peer support. The Mental Health Knowledge Scale, Opening Minds Survey for Workplace Attitudes and Brief Resiliency Scale were used to measure mental health knowledge, stigma towards mental health problems and mental health resiliency, respectively. Cross tabulations and linear regression were used to determine the associations between each mental health training program and mental health outcomes.

Results: 63% of PSP were exposed to one or more mental health training programs. Municipal/ provincial police had the highest prevalence of exposure to mental health training (74.6%), while paramedics reported the lowest prevalence (45.5%). Exposure to any of the five mental health training programs were associated with increased mental health knowledge (Adjusted Beta Range [ABR]: 0.45, 0.94), reductions in stigma about mental health (ABR: -1.42, -1.0) and increased mental health resilience (ABR: 0.39, 0.50), after controlling for sociodemographic variables and exposure to other mental health training programs.

Conclusion: Mental health training is associated with increased mental health knowledge, lower stigma towards mental health problems, and improved mental health resilience. Just over half of PSP report being exposed to one or more mental health training programs during their career. Increasing exposure to mental health training could improve mental health outcomes among Canadian PSP.

1D04: Traumatic Exposures, Occupational Stressors, and Mental Disorder Symptoms among Canadian Public Safety Personnel

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Introduction: Canadian public safety personnel (PSP) are regularly exposed to potentially traumatic events, which increases the risk of mental health problems. However, PSP are also exposed to other stressors as a function of their occupation. Occupational stressors can

include organizational (e.g., staff shortages, inconsistent leadership) and operational (e.g., shift work, negative comments from public) elements. The current study was designed to: (1) examine the association between traumatic exposures and occupational stressors and mental disorder symptoms among Canadian PSP; and (2) examine whether mean occupational stress scores and total number of traumatic exposures are independently associated with mental disorder symptoms among Canadian PSP.

Methodology: Data were collected using a web-based survey collected by the Canadian Institute for Public Safety Research and Treatment, and included 4,820 PSP (i.e., correctional officers and workers, police officers, firefighters, dispatchers, paramedics). The survey tools included established self-report measures for potentially traumatic event exposures (16 events), occupational stressors (20 organizational and 20 operational), and mental disorder symptoms. Analyses included descriptive statistics and logistic regression models.

Results: PSP reported a high level of exposure to traumatic events (M=11.08, SD=3.23). Almost all PSP reported exposures to sudden violent (93.8%) or accidental (93.7%) deaths, serious transportation accidents (93.2%), and physical assaults (90.6%). Organizational stressors associated with the highest mean levels of stress were staff shortages (4.46), inconsistent leadership style (4.44), bureaucratic red tape (4.44), lack of resources (4.29), and feeling that different rules apply to different people (4.15). Operational stressors associated with the highest mean levels of stress were fatigue (4.14), finding time to stay in good physical condition (3.96), occupation-related health issues (3.62), not enough time to spend with family and friends (3.54), and negative comments from the public (3.45). The total mean level of stress associated with operational stressors (3.39) tended to be lower than the total mean level of stress associated with organizational stressors (3.62). Both exposures to traumatic events and occupational stressors were associated with increased odds of screening positive for most mental disorders, with occupational stress remaining independently associated with positive mental disorder screens after controlling for the total number of traumatic exposures.

Conclusion: Canadian PSP reported substantial difficulties with a diverse range of stressors, including occupational stressors, all of which appear associated with increased mental health symptoms. Given that traumatic exposures as a function of employment may be inevitable, policy makers should explore ways to mitigate occupational stressors in support of PSP mental health.

1D05: Child Maltreatment, Career-related Trauma and Suicidal Behaviours among Canadian Public Safety Personnel

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[1]University of Manitoba; [2]University of Regina

Introduction: Child abuse histories have been identified as risk factors for suicidal behaviour in general population samples; however, this association has not been studied among public safety personnel in Canada (e.g., correctional service workers and officers, dispatchers, firefighters, paramedics, police officers). Information on how child abuse histories and career-related trauma together are related to suicidal behaviour also remains unknown. This cross-sectional study was designed to: 1) estimate the prevalence of child abuse histories among Canadian public safety personnel; 2) examine the associations between child abuse histories and suicidal behaviour; 3) examine the

associations between career-related trauma and suicidal behaviour; and 4) examine the cumulative and interactive effects of child abuse and career-related trauma on suicidal behaviour.

Methodology: Data were drawn from a web-based survey collected by the Canadian Institute for Public Safety Research and included 4,199 public safety personnel. Child abuse histories included physical abuse, sexual abuse, and exposure to intimate partner violence in childhood. Suicidal behavior included lifetime ideation, plans, and attempts. Logistic regression models examined the associations between child abuse histories and suicidal behaviours. Cumulative and interaction models tested the relationships between child abuse histories and career-related trauma on suicidal behaviours.

Results: Among public safety personnel, 55.9% experienced one or more types of child abuse. All types of child abuse were significantly associated with suicidal behaviour (Adjusted odds ratio range from 2.06 to 3.25). Career-related trauma was significantly related to suicidal behaviour; however, larger associations existed for child abuse histories. No cumulative or interaction effects were noted.

Conclusion: Both career-related trauma and child abuse histories are significantly related to suicidal behaviours; however, the relationships are stronger for child abuse histories. Identifying and understanding child abuse histories may be an important factor when providing treatment for public safety personnel with suicidal behaviour.

2D01: Fit for Public Safety: Informing attitudes and practices tied to the hiring of public safety professionals (1 of 4)

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Introduction: Some public safety personnel (PSP) professions include mandatory mental wellbeing screening, whereas others do not. There is debate regarding whether such screening is necessary, and whether such screening may be discriminatory. We draw on a pan-Canadian prevalence study of mental disorders to clarify how PSP volunteer information about their perceptions of their colleague's suitability for public safety work. We situate the work within a broader context of efforts to develop resiliency training and prevention programs, which might parallel extant physical ability screening processes. We also comment on concerns regarding such screening for mental health in the absence of prospective data.

Methodology: The current study used results from a pan-Canadian web-based survey of PSP. Recruitment was based on public service announcements from diverse PSP organizations and the Minister for Public Safety and Emergency Preparedness. The survey incorporated screening measures for mental health symptoms and included open-ended questions. Additionally, participants were asked if they had final comments. The voluntary responses to open-ended questions were taken verbatim for analysis. Emergent themes were identified using an inductive approach. NVivo Pro, a qualitative software tool, was used to group responses thematically and then into subcategories. Data were processed until each scheme was representative of emergent themes, and all categories and subcategories were coded reliably.

Results: Hiring practices across PSP occupations were described as overly focused on "political correctness". The correctness was described as a variation of hiring to fulfill institutional mandates and government ideologies, rather than focusing on front-line PSP needs. Further complicating this, participants indicated that PSP organizations presented their occupational expectations in ways that, although understood by the organization members, were ambiguous for the job candidates. Consequently, because occupational nuances can be insufficiently understood by recruits, participants reported believing that individuals may be hired who are not fully comfortable with the actual job requirements.

Conclusion: The current results suggest that, in some ways, mental health accountability is perceived as being the responsibility of the individual in that they should understand the realities and pressures that come with the job they are considering. The degree of personal responsibility appeared particularly apparent in the context of mental illness, wherein respondents believed applicants should be prepared for the work requirements; however, this awareness did not fall to the candidate in isolation. Such results are discussed in relation to cautions around unpacking the consequences versus 'perceived' need to properly screen individuals for their suitability as a PSP.

2D02: Working it Out: Public safety personnel and their coping strategies for dealing with occupational stress (2 of 4)

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Introduction: Canadian public safety personnel (PSP) work in high-stress, emotionally charged, and psychologically demanding jobs. They are exposed to a disproportionate number of on-the-job stressors compared to the general population. The effects of stress exposure leave them susceptible to elevated health-related risks. Yet, very little is known about how PSP cope with the stress of their occupations. Drawing from a national survey that examined the prevalence of mental health disorders among PSP, this qualitative study investigated the coping strategies that PSP report using to deal with their high levels of occupational stress.

Methodology: PSP were recruited through public safety organizations by means of information videos, social media, organizational websites, unions, and emails sent via organizational listservs. Of the nearly 9,000 PSP that completed the online survey, 828 elected to provide final comments in an open-ended text space. Thematic qualitative analysis was used to analyze the data, revealing that coping with stress was a predominant topic. The survey received approval from the University of Regina Institutional Research Ethics Board.

Results: Participants managed occupational stress using four coping strategies: education, peer support, social support, and treatment. Education was reported to help PSP challenge internalized stigma about work-related post-traumatic stress disorder (PTSD) and positively reframe negative thoughts and views about their selves (e.g., weak vs. not weak). Learning about how stress impacts the brain helped PSP shift away from feeling isolated in their position and instead see physical, psychological, and behavioural symptoms of work-related stress as tied to the work environment. Many reported that insights about alterations in the brain due to PTSD have been lifesaving, facilitating their development of coping skills for managing stress. Participants considered that peer support—from those in similar positions or who ranked the same as them—was essential to their ability to cope with

stress, reducing feelings of isolation and providing support. In terms of social support, participants identified family, medical professionals, pets, and hobbies with friends as instrumental in their healing. Participants said they were "doing better" after seeking help from a clinician or recreational or prescribed medications.

Conclusion: Understanding how PSP cope with stress is critical to ensuring their safety and that of the public. PSP used multiple coping strategies simultaneously to deal with occupational stress but still desired that their employers take more interest in their health before, during, and after a traumatic experience. Changing workplace culture could help to depathologize the effects of stress reactions as an individual "failing."

2D03: Persistent Exposure to Trauma: The impact of potentially traumatic events on the mental health of Canadian public safety personnel (3 of 4)

*Tam-Seto, Linna, PhD[1]; Ricciardelli, Rosemary, PhD[2]; Carleton, R. Nicholas, PhD[3]

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Introduction: Regular exposure to potentially traumatic events is expected for those working as public safety personnel (PSP) in Canada including correctional workers and officers, dispatchers, firefighters, paramedics, and police officers. The experiences of witnessing and engaging with potentially traumatic events (e.g., threatened or actual assaults; fires) have been associated with increased risk for mental health disorders. Despite the potentially devastating effects of work-related exposures on mental health and well-being, there is still little known about nature and mechanisms of ongoing traumatic exposure. Our study presents data that explores how Canadian PSP understand and experience their potentially traumatic work environment.

Methodology: Data for the current study were from a web-based self-report survey made available in English and French to PSP across Canada. The survey included several established measures that screen for mental health symptoms. Participants also volunteered narrative responses to open-ended questions, the verbatim content of which were used for analyses. Respondents were recruited through their respective employers or organizations, as well as public service announcements including one from the federal Minister of Public Safety and Emergency Preparedness. An inductive approach was used to analyze emergent themes using NVivo Pro. All data was coded until each scheme was representative of the collection of emergent themes and all categories and subcategories were reliably coded.

Results: More than 9000 PSP participated in the survey, including 828 individuals who responded to the open-ended questions. The study results supported two distinct themes associated with exposure: 1) numerous potential index traumas; and 2) cumulative potential traumas. Respondents underscored the challenge of identifying a single 'index trauma', as many reported several events as traumatic. Respondents also underscored that the accumulation of potentially traumatic events could have a greater impact than any single 'index trauma'. There was also evidence of concerns that not being able to identify a singular casual traumatic event detracted from others taking their suffering seriously.

Conclusion: The current results begin to reveal how Canadian PSP experience the nature of persistent exposure to potential traumas in their work. PSP reported experiencing numerous significant poten-

tially traumatic events, which separately or together can be perceived as causing symptoms. PSP also reported concerns that cumulative exposure may not be viewed as significant relative to a singular event exposure that stands out. The results critically inform future studies on the types and nature of work-related trauma; in addition, the results may inform the ongoing development of education, diagnostic, and treatment pathways for PSP.

2D04: Behind the Frontlines: Exploring the mental health and help-seeking behaviours of public safety personnel who work to support frontline operations (4 of 4)

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Introduction: The stressors experienced by individuals, such as dispatchers, administrators, health professionals, and civilian police officers, whose occupational role provides direct support for frontline public safety personnel may be less evident in comparison to those experienced by first responders. Drawing on qualitative data from a recent online survey, the purpose of this study is to explore how public safety personnel working 'behind the frontlines' experience a variety of operational and organizational stressors that independently and collectively impact their mental health.

Methodology: Although nearly 9000 public safety personnel participated in the online study, 828 opted to provide feedback at the end of the survey when asked if they had any final comments. We analyzed core themes that emerged from these textual responses, specifically by those working 'behind the frontlines'. Participants were recruited through employers and professional organizations, along with public service announcements and social media. An inductive approach to analysis was used, with data coded repeatedly until emergent themes were saturated.

Results: For those working to support the frontline operations, there are additional layers to consider when exploring mental health challenges and help seeking behaviours. Three themes emerged: 1) an experience of outsiders within the systems; 2) the process to recognize and validate their own struggles with mental health is slow and mired with self-doubt; and 3) despair that their situation can improve is not uncommon.

Conclusion: The themes suggest that public safety personnel working behind the frontlines are also at risk for experiencing trauma and its impacts on their mental health and help-seeking behaviour. Their perceptions underscore a struggle with validating their difficulties and envisioning a future in which their issues are resolved.

3D01: Understanding Early Influences on the Retention and Satisfaction of Volunteer Firefighters: A protocol

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University of Otago

Brief Description: Outside the metropolitan centres, Fire and Emergency New Zealand volunteers are essential to the first response effort. Volunteer retention is not good: at five years only 57%. In Australia, exit surveys completed by 396 former volunteers identified work/family needs (51%), moving area (38%), and age/health issues (28%) as reasons for leaving. However, dissatisfaction with the volunteer role and poor brigade leadership were potentially modifiable factors. Further exploration of possible cause and effect requires a longitudinal survey design, taking into account the 'first responder' role, recognition of volunteer firefighters' susceptibility to PTSD, awareness that family issues play a role in volunteer firefighter resignations, and that social, organisational and community support may be critical coping resources.

Outcomes: The aim is to assess how 'volunteer satisfaction' and 'intention to exit at 12 months' is related to personal and organisational factors. The former include psychological wellbeing and engagement, impacts of volunteering on family and work life, family and community support. The organisational domains include brigade leadership, training, and the effect of organisational support interventions.

These factors will be measured at baseline, with follow up at 12 and 24 months. A number of brief and validated measures will be included in the survey: the 8-item version of the Survey of Perceived Organizational Support; the General Health Questionnaire 12 for psychological wellbeing, the PCL checklist for PTSD, the 9 item Utrecht Work Engagement Scale, and the Volunteer Satisfaction Index. We are in the process of developing a measure of family relationships, along with a 'leadership and training' questionnaire, based on coaching skills, and specifically designed for the fire and emergency services.

Patient Population: Volunteer firefighter initial recruits.

Conclusion: This will be the first longitudinal study to investigate the retention of new volunteer firefighters in NZ over time. It will help identify both risk and protective factors for volunteer engagement and 'intentions to exit'. The design would allow for longitudinal latent class analysis (LLCA) to investigate factors associated with 'trajectories' of satisfaction and engagement over time, particularly whether satisfaction growth or depreciation is occurring.

3D02: Design and Evaluation of a First Responder Resiliency Program

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Introduction: First-Responder culture often emphasizes a need to project a strong, stoic image which can inadvertently contribute to stigma, interfere with social support, and increase adjustment difficulties. The First-Responder Resiliency Program (FRRP) is a peer-based program that was designed in collaboration with First Responders, to help them retain or regain resiliency and well-being despite ongoing exposure to operational stress. The program consists of a four-day residential retreat that focused on understanding the mechanisms and effects of cumulative operational stress on the body, the brain, and on relationships, normalizing reactions, building self-regulation skills, providing peer support, and referral to more intensive mental health services where needed. This study presents the outcome evaluation results for the pilot.

Methodology: A mixed methods approach was used to inform formative and summative evaluation questions.

Qualitative evaluation consisted of semi-structured intake interviews, follow up interviews 2 weeks post-program, and anonymous feedback provided by participants to the BC Professional Fire Fighters Association.

Quantitative measures included Beck Depression Inventory (BDI II), the PTSD Checklist for DSM-5 (PCL-5), and the Outcome Questionnaire 45.2 (OQ 45.2). Measures were administered at intake, two weeks post-program completion, and again at six months post program completion.

Participants: The program was delivered for seven pilot runs with each cohort consisting of 8 to 10 participants, two professional facilitators and two "team lead" first responders. A total of 60 first responders agreed to participate in the pilot test. Participants were all currently employed or volunteering in first responder roles (Fire Fighters, Police, Paramedics, and Search and Rescue Personnel).

Results: Outcome testing showed clinically and statistically significant changes in pre/post test scores across all three measures, BDI II, PCL-5 and OQ45.2. Post testing at 6 months showed that statistically significant gains were maintained on all measures.

Typical statements from the qualitative evaluation included:

"This program will save many lives."

"I am no longer in a downward spiral of isolation and depression. I have a light at the end of the tunnel and am for the first time in a very long time hopeful for a bright future.

No negative comments were provided through interviews or submitted anonymously.

Conclusion: Quantitative and Qualitative program evaluation suggests that this kind of collaboratively designed and run, peer-based, intensive residential resiliency programming may be beneficial in giving first-responders the tools and peer support necessary for them to manage operational stressors encountered in their work.

3D04: Comparing Occupational Stressors and the Mental Health of Male and Female Canadian Correctional Officers

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Introduction: Occupational stressors occur to some degree in all work environments, and if they are severe enough they may affect the mental health of the employees. The current study was designed to: (1) examine two elements of occupational stress (operational and organizational) in male and female Canadian correctional workers; and (2) examine whether operational and occupational stressors are associated with symptoms of poor mental health.

Methodology: Data were collected by the Canadian Institute for Public Safety Research and Treatment using a web-based survey procedure, and included 1,308 correctional officers. The survey tools included established self-report measures for occupational stressors (20 organizational and 20 operational), and various aspects of mental health. Analyses included descriptive and non-parametric bivariate statistics.

Results: There were slightly more female respondents (56.7%) than males. Females reported slightly lower mean organizational and significantly lower operational stress than males (2.8vs 2.9, and 1.9 vs 2.1, respectively). The three highest mean organizational stressors were the same for both male and female workers - inconsistent leadership style, bureaucratic red tape, and feeling that different rules apply to different people. The top four operational stressors were the same for males and females, but in different orders of priority. Fatigue, finding time to stay in good physical condition, occupation-related health issues, and paperwork caused the most stress. Operational and organizational stress was significantly correlated with increased symptoms of PTSD, anxiety, depression, stress, anger, and lower resiliency in both males and females, and with alcohol use disorders in males only.

Conclusion: Male and female Canadian correctional officers reported the same top four operational and three organizational stressors. Both operational and occupational stressors, are significantly associated with increased mental health symptoms. It is important for management and government officials to identify sources of stress in order to potentially improve the mental health of correctional officers in Canada.

3D06: When is Knowledge Power: Mental health knowledge, stigma, and service use among public safety groups

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University of Regina

Introduction: Between 34.1% and 54.6% of public safety personnel (PSP) report symptoms consistent with at least one mental disorder (Carleton et al., 2017). Inherent work-related stress amplifies vulnerability of PSP for mental disorders. Strong efforts have been allocated to increase resilience (National Defence and the Canadian Armed Forces, 2017). Resilience training has proposed mental health education to reduce the stigma around mental illness and increase the likelihood to seek treatment (Papazoglou & Andersen, 2014). The current investigation was designed to examine rates of mental health knowledge, stigma, and attitudes concerning service use amongst PSP.

Methodology: A total of 5,812 Canadian PSP completed a survey assessing their knowledge and stigma of mental health concerns and their intentions to use mental health services. PSP were categorized into six groups for comparison: Royal Canadian Mounted Police (RCMP), municipal/provincial police, paramedics, call centre operators/dispatchers, correctional workers and officers, and firefighters.

Results: Mental health knowledge and stigma were inversely correlated ($r = -.325$, $p < .001$). Paramedics, RCMP, correctional workers, and call centre operators/dispatchers reported more knowledge than firefighters and municipal/provincial police, $p < .001$, w = 0.13. Firefighters and municipal/provincial police also demonstrated higher levels of stigma than other PSP groups, $p < .001$, w = 0.17. Service use intention was slightly correlated with knowledge ($r = .192$, $p < .001$) and stigma ($r = -.179$, $p < .001$). Correctional workers and officers, and call centre operators/dispatchers considered using mental health services more than RCMP and paramedics, $p < .001$, w = 0.07.

Conclusion: Among PSP, greater mental health knowledge was related to lower stigma and greater intentions to use mental health services. PSP groups differed on levels of these three constructs. Differences may be explained by more systematic, organizational differences between PSP groups, such as exposure to mental health con-

cerns through public safety work or access to mental health resources or other supports. Comparison of the current results to reported estimates of mental disorder symptoms in PSP groups (Carleton et al., 2017), suggests that the PSP groups reporting the highest prevalence of mental health symptoms also report the lowest stigma, highest mental health knowledge, and greatest intentions to use services. The comparison suggests differences in stigma, knowledge, and intentions to use services may stem from personal experiences with mental health concerns. Mental health education may be more efficacious when targeting PSP experiencing symptoms rather than as a resiliency intervention.

4D01: Sex and Cognitive Risk Factors Explain Variance in Police Mental Health Symptoms (1 of 4)

*Korol, Stephanie, MSc; Teale Sapach, Michelle, MA; Carleton, R. Nicholas, PhD

University of Regina

Introduction: Estimates suggest that 41% of male, and 51.7% of female, Canadian public safety personnel screened positive for one or more mental disorder(s) (Carleton et al.,2017). Significant sex differences in reported symptoms were found within municipal/provincial police. The current study was designed to understand whether dispositional risk factors for mental disorders, namely anxiety sensitivity (AS) and intolerance of uncertainty (IU), explained variance in municipal/provincial police officers' reported symptoms of posttraumatic stress disorder (PTSD), panic disorder (PD), social anxiety disorder (SAD), major depressive disorder (MDD), and generalized anxiety disorder (GAD) beyond variance explained by sex. AS and IU were hypothesized to explain more variance in municipal/provincial police officers' reported symptoms than sex.

Methodology: Municipal/provincial police (708 male and 271 female) completed measures assessing PTSD, PD, SAD, MDD, GAD, IU, and AS. Multivariate analysis of variance (MANOVA) assessed symptom differences in males and females. Hierarchical multiple regressions assessed the contributions of sex, IU, and AS to mental disorder symptoms. Sex was entered into the first step of the hierarchical regression, and AS and IU were entered in the second step. Analyses were bootstrapped with 1,000 samples to provide robust probability estimates.

Results: The MANOVA resulted in significant sex differences for measures of PTSD, PD, SAD, MDD, and GAD (ps<.05). Hierarchical multiple regression analyses found that sex accounted for significant variance in measures of PTSD, PD, SAD, MDD, and GAD (all R^2=.01;ps<.05) when entered into the first step of the model. AS and IU accounted for greater variance in measures of PTSD (R^2=.29), PD (R^2=.35), SAD (R^2=.39), MDD (R^2=.34), and GAD (R^2=.40;ps<.01). Sex only accounted for unique variance in the final models predicting PD, MDD, and GAD after AS and IU were entered into the model.

Conclusion: The current results suggest that cognitive risk factors (AS and IU) explain more variance in mental disorder symptoms than variance explained due to sex differences. AS and IU are modifiable dispositional factors that can be targeted through various treatment protocols. Female municipal/provincial police officers who experience heightened levels of mental health symptoms, or are at risk of these symptoms, may benefit from treatment/preventative approaches to reducing AS and IU. Future research should investigate other factors (i.e., health behaviours, support) that may explain the significant variance due to sex differences in PD, MDD, and GAD.

4D02: Social Support and Sleep Quality Mediate Sex Differences in PTSD, Depression, and Generalized Anxiety Symptom Severity in Canadian Police Officers (2 of 4)

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University of Regina

Introduction: In a survey of Canadian public safety personnel (PSP), researchers found elevated rates of posttraumatic stress disorder (PTSD), depression, and generalized anxiety disorder (GAD). Most PSP groups did not produce evidence of sex differences across disorders; however, differences were found for municipal/provincial police, such that females reported significantly higher rates of PTSD, depression, and GAD. Low social support (SS), stress, and poor sleep quality (SQ) are external risk factors that are associated with increased symptom severity for PTSD, depression, and GAD. Sex differences between male and female police officers could reflect differences in external risk factors; as such, research is needed to better understand the differences.

Methodology: There were three mediation analyses used to assess whether risk factors might help explain sex differences in PTSD, depression, and GAD in municipal/provincial police members (n = 1163). Each mediation used symptoms of PTSD, GAD, or depression as the dependent variable. For all analyses, measures of SS, stress, and SQ were included as mediators, and sex was used as the independent variable.

Results: There was an indirect effect of sex on posttraumatic stress that was significantly mediated through both SS (b = -0.445, BCa CI [-0.825, -0.142]) and SQ (b = 1.215, BCa CI [0.211, 2.296]), but not through stress (b = -0.220, BCa CI [-0.836, 0.380]). There was an indirect effect of sex on depression symptoms that was significantly mediated through both SS (b = -0.198, BCa CI [-0.345, -0.068]) and SQ (b = 0.458, BCa CI [0.061, 0.078]), but not through stress (b = -0.051, BCa CI [-0.170, 0.052]). There was an indirect effect of sex on anxiety symptoms that was significantly mediated through both SS (b = -0.020, BCa CI [-0.042, -0.006]) and SQ (b = 0.068, BCa CI [0.010, 0.125]), but not through stress (b = -0.014, BCa CI [-0.043, 0.016]).

Conclusion: Male and female police officers do not seem to differ in the amount of stress that they experience; however, differences in PTSD, depression, and GAD severity between both sexes, may be partially accounted for by other external risk factors. Specifically, female officers may experience more severe clinical symptoms, in part, because they have less SS and worsened SQ. The current results underscore the importance of incorporating strategies to modify these external risk factors into PSP workplace environments, as doing so could ultimately improve the mental health of female police officers

4D03: Sex Differences in PTSD Symptom Patterns of Public Safety Personnel after Controlling for Sexual Violence (3 of 4)

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Introduction: Public safety personnel (PSP; e.g., firefighters, police officers) are frequently exposed to traumatic events that can lead to

posttraumatic stress disorder (PTSD), although PTSD rates vary according to PSP occupation and sex (Carleton et al., 2017). Correctional workers and officers and RCMP officers screened positive for PTSD symptoms more than other PSP; however, female municipal/provincial police officers and firefighters screened positive for PTSD at rates higher than their male counterparts. Sexual violence, which is more common among women, has been associated with a specific pattern of PTSD symptoms (Amerongen et al., 2017; Elliott et al., 2004). Despite differences in PTSD rates by PSP occupation and sex, researchers have not examined the impact of such factors on symptom presentation while controlling for history of sexual violence.

Methodology: Participants included 5,297 Canadian PSP who self-reported their sex and occupation, stated whether their worst trauma involved sexual violence, and completed the PTSD Checklist for *DSM*-5. PSP occupations were divided into six general occupational categories: firefighters, paramedics, municipal/provincial police, RCMP, dispatchers, and correctional workers. A factorial ANCOVA was used to evaluate whether the interaction between PSP occupation and sex influenced overall PTSD severity. Profile analysis was used to compare PTSD symptom clusters for men and women within each PSP occupation when controlling for sexual violence.

Results: There was a main effect of occupation for overall PTSD severity, $F(5, 5234)=12.942$, $p=.000$, $\eta p^2=.012$, and an interaction between PSP occupation and sex, $F(5, 5234)=4.513$, $p=.000$, $\eta p^2=.004$, but no main effect of sex ($p=.999$). Based on the profile analyses examining PTSD symptom clusters for each occupation, there were only main effects of sex ($ps\leq.049$) among dispatchers and firefighters. There were significant sex by symptom cluster among dispatchers, police, and RCMP ($ps\leq.001$), but not among the other occupations ($p\geq.186$).

Conclusion: The current results indicate that after controlling for a history of sexual violence, sex is associated with specific PTSD symptom presentations within some PSP occupations. The results provide further evidence for PTSD symptom typologies based on individual characteristics such as occupation and sex (and gender), which can be used to inform the design of more targeted PTSD interventions that account for differences across PSP. Further research may examine the PTSD symptom patterns of individuals who are not cisgender or elucidate underlying differential risk and resiliency factors beyond a history of sexual violence.

4D04: Trauma on TV: Gendered responses to critical incidents on Canadian police procedurals (4 of 4)

Britto, Sarah, PhD

University of Regina

Introduction: Law enforcement occupies practical and symbolic space within our individual psyches and our collective understanding of society. Research has shown that media portrayals of crime and the criminal justice system help shape attitudes toward the police and how the public views the police as an institution. There is a paucity of research on how fictional police characters on television respond to critical incidents. Examining these portrayals provides insight into one source of information and stereotypes about public safety professionals' mental wellness and responses to trauma. This study will use a content analysis of three of the most popular Canadian police procedurals – *19-2*, *Rookie Blue*, and *Motive* – to examine the portrayal of critical incidents and responses to these incidents by police officers. Both quantitative and qualitative items are included in this study. Particular attention will focus on how gender shapes the construction of mental health issues in these

fictional portrayals. The theoretical and practical implications will be discussed in terms of how these portrayals may influence crime-related public perceptions and attitudes toward the police.

Methodology: This study will uses content analysis to examine both quantitative and qualitative content of Canadian police procedurals. The instrument includes items ranging from the race, sex, and age of police officers to items concerning critical incidents and PTSD symptoms of the characters.

Results: This is a pilot project, which is currently in the data collection and initial analysis state. At this point, it is clear that the portrayal of critical incidents is a regular component of Canadian police procedurals.

Conclusion: Particular attention will focus on how gender shapes the construction of mental health issues in these fictional portrayals. The theoretical and practical implications will be discussed in terms of how these portrayals may influence crime-related public perceptions and attitudes toward the police.

4D05: The Interrelationships of Personality, Public Safety Personnel Occupations, and Gender

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University of Regina

Introduction: Public safety personnel (PSP) include several occupations (e.g., correctional workers and officers, dispatchers, firefighters, paramedics, police officers, RCMP officers). PSP occupations involve very different types of work and responsibilities; as such, each profession may well attract different types of individuals. Previous research results have demonstrated relationships between several different personality traits and vocational preferences. The present study provides the first detailed personality trait analyses of individuals working in PSP across Canada. There were six dimensions of personality, including Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness, compared across several different PSP occupations.

Methodology: Individuals currently working in PSP ($N = 4303$) completed a web-based questionnaire, available in English and French, which included demographic items and the 24-item Brief HEXACO Inventory (BHI) for personality traits. Previous research using the HEXACO scale has demonstrated gender differences in mean scores for personality traits (e.g., Emotionality), and women are not consistently represented across PSP occupations; accordingly, gender was considered a critical covariate. A two-way MANOVA was conducted with individuals grouped by occupation and gender, and HEXACO personality scores entered as dependent variables.

Results: The results suggested a statistically significant effect of occupation, $p < .0001$, partial $\eta^2 = .008$, and a significant gender effect, $p < .0001$, partial $\eta^2 = .009$, for the six personality factors. Occupations differed significantly on Emotionality, $p < .0001$, partial $\eta^2 = .011$, Extraversion, $p < .0001$, partial $\eta^2 = .011$, Agreeableness, $p = .014$, partial $\eta^2 = .004$, Conscientious, $p = .042$, partial $\eta^2 = .003$, and Openness, $p < .0001$, partial $\eta^2 = .021$. Consistent with previous research, an effect of gender on Emotionality was found, $p = .001$, partial $\eta^2 = .002$. Gender was also significantly related to Honesty-Humility scores, $p = .006$, partial $\eta^2 = .002$ and Extraversion scores, $p = .004$, partial $\eta^2 = .002$. There was also statistically significant interaction effect between gender and occupation on the combined dependent variables, $p = .024$, partial $\eta^2 = .002$,

which was driven by a significant interaction effect on the Openness scores, p = .016, partial η^2 = .004.

Conclusion: Small, but significant, differences in personality traits were identified between the different occupations within the PSP. Across the PSP occupations, the largest differences were seen for the Emotionality and Extraversion traits. Further research is warranted to explain the nature of these differences and investigate any possible utility for personnel selection.

5D01: A Meta-analysis of Road to Mental Readiness Outcomes and Meta-regression of Outcome Predictors

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[1]University of Calgary; [2]Mental Health Commission of Canada

Introduction: First responder mental health has been a topic of increasing interest given the high incidence of poor mental health, mental illness and suicides. Although research generally suggest that resiliency and stigma reduction programs can directly and indirectly affect mental health, little research has examined this type of training in first responders. The current paper examines the efficacy of the Road to Mental Readiness (R2MR) for First Responders program, which is a resiliency and anti-stigma program adapted from work by the Department of National Defense.

Methodology: The research employed a pretest, post-test, 3 month follow-up design in 5 first responder groups, across 16 sites in Canada. Standardized measures of resiliency, stigma towards mental illness, mental health literacy and use of the tool from the program were used, to facilitate cross- site comparisons.

Results: A meta-analytic approach was used to estimate the overall effects for resiliency increases and stigma reduction. Results indicated that R2MR was generally effective at increasing participants' perceptions of resiliency and decreasing stigmatizing attitudes at pre-post and these results were mostly maintained at 3 months follow-up, although some return toward baseline suggested the need for maintenance activities. Predictors of outcomes were also explored through meta-regression methods, and suggested that the program generally worked similarly across sites and various types of first responder groups.

Conclusion: The overall outcomes of this paper are that the Road to Mental Readiness program has benefits for Canadian first responder groups. The discussion will emphasize program content and implementation issues that facilitated the current results, and will provide directions for further program development and evaluation.

5D02: A Key Informants Study of Road to Mental Readiness

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Introduction: Organizational characteristics and attributes are critical issues to consider when implementing and evaluating workplace training. This study was a qualitative examination of the organizational context as it pertained to the implementation of a workplace mental health program called Road to Mental Readiness (R2MR) in police organizations in Canada.

Methodology: We conducted a qualitative key informant study in nine different policing organizations in Canada. Key individuals in these organizations were identified, and then interviewed with a semi-structured interview that looked at both strengths and challenges in the implementation of the R2MR program in their setting.

Results: The central theme of "successful cultural uptake" emerged as key to R2MR's implementation and the ability to facilitate broader culture change. Successful cultural uptake was enabled by several contextual factors, including organizational readiness, strong leadership support and support from organizational champions, ensuring good group dynamics, credibility of the trainers, implementing widely and thoroughly, and implementing R2MR as one piece of a larger puzzle. This enablement occurred through enhanced dialogue about mental health and the introduction of a common language, a supportive workplace culture, increased help seeking, and organizational momentum for additional mental health programming and policy initiatives.

Conclusion: Successful uptake of R2MR has the potential to lead to promote change within policing organizations. The model derived from our research may function as a tool or roadmap to help guide other organizations in the process of or planning to implement R2MR or a similar intervention.

6D01: Correctional Staff Challenges: The issue of job stress (1 of 4)

Lambert, Eric, PhD

University of Nevada

Introduction: Correctional staff perform a myriad of tasks and duties to ensure a safe, secure, and humane facility is in operation. Staff are not only a valuable resource but an expensive one, with about 80% of the budget being spent on staff. Staff face many challenges. One of these challenges is job stress, which is defined as feeling psychologically distressed or strained due to work demands or stressors. Job stress has detrimental consequences for both staff and the correctional organization. It is important to identify and correct workplace factors which contribute to stress.

Methodology: A systematic review of correctional staff job stress studies in North America (particularly the United States) from the mid-1970's was conducted. The results of these past studies were examined and placed in two major groups of consequences and antecedents. Among the antecedents were further broken down into workplace variables of job demands and job resources based on the job demands-resources model. This model provides a framework for why workplace factors may effect job stress. This model divides the workplace variables into the groups of demands and resources. Job demands place staff under pressure, which can result in higher job stress. Job resources allow staff to focus on the positive aspects of the job and can help buffer staff from job demands, which can result in lower job stress. Additionally, the absence of (or deficiencies in) job resources can become job demands.

Results: The major job resources for correctional staff are quality supervision, input into decision-making, and instrumental communication. The major job demands faced by correctional staff are fear of victimization, work-family conflict, and the role stressors of role conflict, role ambiguity, and role overload. Reducing fear of victimization, work-family conflict, and role stressors are predicted to decrease job stress. Additionally, the job resources of quality supervision, input into decision-making, and instrumental communication need to be

enhanced in order to help reduce job stress among correctional staff. Furthermore, social support, especially supervisory and administrative support need to be raised, as well as providing mental health support for staff and their families to combat correctional staff job stress.

Conclusion: The results indicate the need to be aware of job stress for correctional staff and to address it. Not only is it important to increase job resources and reduce job demands in correctional institutions, but interventions need to be instituted. Stress reduction and coping programs need to be offered and required.

6D02: Working in Corrections both North and South of the Border: Similar challenges in different countries (2 of 4)

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Introduction: A growing body of research has examined employment in corrections in the United States and the causes of stress, turnover, and job satisfaction in that field. A smaller body of research has begun to examine these same subjects in Canada. Using a team of authors from both the United States and Canada, we compare the literature and extant data regarding employment in corrections on both sides of the border. While this knowledge may exist in silos in both the United States and Canada, we are unaware of any recent effort that consolidates this information in a scholarly article. We anticipate that this work will be the foundation of numerous scholarly products using data from both Canada and the United States that will be produced by this research team.

Methodology: Data for this study will include a systematic review of scholarly articles focused on working in corrections in the United States and Canada. As part of this review, we will seek to identify similarities and differences in a number of factors found to be relevant among employees in correctional settings. These topics (and thus search terms for the systematic review) will include job stress, perceptions of organizational justice, organizational commitment and citizenship, and job satisfaction, among others. In addition to the systematic review, we will also meld extant information about the demographics of working in corrections in both Canada and the United States. When available, for both the United States and Canada, these topics include descriptive statistics of the gender, race, education, and age of correctional employees; the mean/median salary of correctional employees; turnover among corrections employees; and work-related occupational injuries and fatalities among corrections employees.

Results: Our preliminary work suggests that many of the challenges of working in corrections vary little between Canada and the United States. These jobs are typically low-paying, high stress jobs with high turnover. Nevertheless, key differences appear to emerge around organizational commitment and perceptions of organizational justice, both within the United States and across the two countries.

Conclusion: The results of our study begin to explore how working in corrections varies between the United States and Canada. Our hope is that this research will assist policymakers in both countries in their efforts to improve correctional employment on both sides of the border.

6D03: Experiences of Trauma: Implications for the health and well-being of Provincial Correctional Officers working in Atlantic Canada (3 of 4)

Power, Nicole, PhD; *Ricciardelli, Rosemary, PhD

Memorial University of Newfoundland

Introduction: There has been increased public and scholarly attention paid to work-related mental health issues, specifically Post-Traumatic Stress Injuries (PTSI) among first responders and public safety personnel more broadly. Yet, little remains known about the work-related mental health issues and experiences of peace officers employed in institutional corrections; officers responsible for the safety and security of a custodial population, their colleagues, and wider society. Given the occupational demands, it is imperative that we consider the particular mechanisms underpinning negative and positive health outcomes for correctional officers. Thus, my objective is to examine the relationship between aspects of the work content (operational stressors) and context (organizational stressors) in corrections and how such stressors may influence correctional officer mental health and trauma related experiences at work.

Methodology: Using a qualitative study I conducted semi-structured interviews with provincial correctional officers working in Canada and participant observation. Interviews were conducted onsite with officers employed in a correctional facility in Eastern Canada in September 2014. There are 31 participants, 23 men and 8 women, ranging in age from 28 to 58. All of the officers worked in a prison that holds adult men and/or women sentenced to a maximum of two years less a day or remanded into custody while awaiting trial or sentencing.

Results: COs reported a range of mental health issues, often tied to experiences of a traumatic anchor event or cumulative traumas, and identified operational and organizational stressors as contributing factors. Participants identified a number of operational stressors impacting mental health, specifically generalized violence among prisoners and traumatic incidents in the workplace, direct and vicarious violence, and ongoing harassment directed at officers from prisoners (and staff at times). Officers also identified organizational stressors, including a work culture that discouraged visible emotional responses to operational stressors, a lack of support from management, and inadequate policies and procedures dealing with workplace violence and harassment, as factors that exacerbated and contributed to their mental wellbeing.

Conclusion: I found that a damaging work environment, and in particular one that is characterized by normalized violence, traumatic events, and a lack of organizational support, is a stressor that impact correctional officers' mental health. Many officers experience concerns with their mental health, yet do not know how to address their mental needs in the context of their work environment.

6D04: Comparing Occupational Stressors and the Mental Health of Male and Female Canadian Firefighters (4 of 4)

Cramm, Heidi, PhD[1]; Groll, Dianne, PhD[1]; McCreary, Don, PhD[2]; *Carleton, R. Nicholas, PhD[3]; Dolp, Reinhard, MD[1]

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Introduction: Occupational stressors occur to some degree in all work environments, and if they are severe enough they may affect the men-

tal health of the employees. The current study was designed to: (1) examine two elements of occupational stress (operational and organizational) in male and female Canadian firefighters; and (2) examine whether operational and occupational stressors are associated with symptoms of poor mental health.

Methodology: Data were collected by the Canadian Institute for Public Safety Research and Treatment using a web-based survey procedure, and included 1,217 firefighters. The survey tools included established self-report measures for occupational stressors (20 organizational and 20 operational), and various aspects of mental health. Analyses included descriptive and non-parametric bivariate statistics.

Results: There were more male respondents (84.1%) than females. Females reported higher mean organizational and operational stress than males (2.1 vs 1.9, and 1.7 vs 1.6, respectively). Two of the three highest mean organizational stressors were different for both male and female workers. Both identified 'inconsistent leadership style', and females chose 'feeling you always have to prove yourself', and 'feeling that different rules apply to different people'. Males identified 'bureaucratic red tape', and 'dealing with co-workers'. The top three operational stressors were the same for males and females. Fatigue, finding time to stay in good physical condition, and work-related exposure to traumatic events caused the most stress. Operational and organizational stress was significantly correlated with increased symptoms of PTSD, anxiety, depression, stress, anger, and lower resiliency in both males and females.

Conclusion: Male and female Canadian firefighters reported different top three organizational stressors, but the same top three operational stressors. Both operational and occupational stressors, are significantly associated with increased mental health symptoms.

6D05: Toward the Development of a National Technology Platform for the Delivery of Internet Cognitive Behavioural Therapy for Public Safety Personnel

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Introduction: Internet Cognitive Behavioural Therapy (iCBT) has been shown to improve the delivery of mental health support and treatment to a wide range of populations, yet none yet have targeted PSP. The complexity of iCBT technologies is further subject to regional, national and international regulation. Accordingly, implementations of iCBT generally utilize regional technology platforms, limiting the system's complexity. Expanding these systems to new regions, populations or mental disorders (e.g., to treat PSP) requires a replication of the original system with modifications to accommodate any new criteria, preventing large-scale implementation. The current study presents our work toward the development of an iCBT platform for PSP supporting a seamless national scale-up, piloted initially on correctional workers in Newfoundland and Labrador.

Methodology: We conducted a literature review of all existing iCBT implementations globally to understand the landscape of technology use in iCBT globally. Then, we performed an environmental scan of all available cognitive computing platforms and associated features, within the context of the results of the literature review, to find potential hosts for our iCBT intervention. Finally, we conducted focus groups to begin to understand how to make iCBT accessible to a correctional

officer population.

Results: Our review revealed that iCBT interventions utilized a myriad of technologies ranging from low- to high-tech, targeting either specific (e.g., youth) or general populations and disorders (e.g., PTSD). These technologies utilize local solutions (e.g., local servers) with limited facility to scale. Our environmental scan revealed several cognitive computing platforms (e.g., Microsoft Cognitive Services and IBM's Watson Platform for Health) that could be used to host the same interventions more extensibility. Our scan further identified that digital content management systems, (e.g., Drupal) could assist in developing and expanding iCBT interventions to populations currently untreated using iCBT (e.g., PSP). Early analyses of the focus group transcripts show that, among other things, stigma and timing represents a significant barrier to access to care.

Conclusion: Findings from our focus groups have identified that correctional officers have unique factors impacting their use of iCBT compared to the general population, suggesting that substantial research and iterative development toward an iCBT solution. However, we also found that most iCBT implementations were developed for specific applications, making them difficult to modify and expand. Accordingly, dynamic, agile and scalable technologies, like cognitive computing platforms and content management systems, will be critical in supporting the development of our provincial iCBT for correctional officers, and eventually for our national iCBT for PSP.

Poster Presentations

P160: Towards Evidence-based Peer Support Program Development for Canadian Fire Fighters: First steps

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Brief Description: The operational risks faced by firefighters that influence increased rates of negative mental health outcomes are numerous and varied. A developing research base has begun to illuminate the utility of peer support to mitigate the impact of operational stress, on first responders generally, and firefighters specifically. The Firefighters Assistance Charitable Society in Calgary, AB has supported development of a peer support program to help its firefighting membership. The steps followed to develop the peer support program, that was modelled upon recommendations made by Creamer et al., (2012), will be reviewed. Peer support data is being gathered, relative to the impact of involvement in the program on the peer supporters, as well as the effectiveness of the program to support firefighters. One-year longitudinal data will be presented that describes the number of firefighters who have accessed peer support, as well as the concerns they have accessed peer support to address.

Clinical Outcomes: This presentation will describe longitudinal data of a peer support program for firefighters. Data will be presented that describes the number of members served by the peer support program since its inception in January 2017, as well as their demographic information. The types of issues for which they sought peer support will also be described. The peer support program will be discussed, including how its development was informed by available empirical guidelines. An operational discussion will also ensure, focusing on how the peer team program has functioned since it launched in January 2017, including how mental health support is being provided to the peer support team members as a course of their involvement in

peer support.

Patient Population: This presentation will describe the Calgary, AB firefighting membership, and how firefighters have been accessing peer support since the peer support program began delivery in January 2017. It will also identify information about the peer support team, and how they are being supported to engage in peer support as part of their firefighting roles.

Conclusion: The Firefighters Assistance Charitable Society based in Calgary, AB met an objective in 2016 of developing a peer support program for its firefighter membership, which launched in January 2017. The development of this program followed empirical guidelines in the nomination and selection process of its peer team, and this process will be described. Preliminary data following 1 year of program delivery will be reviewed. Evaluation of this method of service delivery is ongoing and implications for future research will be discussed.

P161: Prevalence of Exposure to Critical Incidents in Firefighters across Canada

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Introduction: Firefighters, paramedics, and other public safety personnel represent distinct and highly trained populations designated to handle extremely stressful situations on very short notice. Critical incidents (CI) is a term used in reference to event exposures that are traumatic and of sufficient intensity they might be expected to have adverse mental health consequences. It has been defined as an overwhelming and sudden experience that surpasses an individual's normal coping skill. Repetitive exposure to such events can be identified as a factor that affects psychological and mental health. Although a few studies have reported critical incident exposures among firefighters, we know that these will vary across countries, provinces, fire-stations and socio-political considerations. Therefore, the specific aims of this study were: 1) to determine the prevalence of critical incidents in active firefighters across various fire services in Canada, and 2) to predict the number of critical events based on age, gender and years of service.

Methodology: We recruited 390 [272 males (41.0 ± 9.5 years), 118 females (34.3 ± 8.50 years)] firefighters. Firefighters were asked to complete a self-report Critical Incident Inventory survey that included questions on exposure to critical events during firefighting duties, over the span of their entire firefighting careers. Ethical approval was secured for this study through the Hamilton Integrated Research Ethics Board.

Results: Among the 390 firefighters, 376 (96.4 %) indicated exposure to some type of critical incident. More specifically, 351 (90 %) reported a respond to incident involving one or two deaths, 314 (80.5 %) reported a respond to incident involving multiple serious injuries, 312 (80 %) reported a direct exposure to blood and body fluids, and 300 (77 %) reported a respond to incidents involving removal of dead bodies. In predicting the number of critical incidents among firefighters, gender and years of service were shown to be the two statistically significant (p < 0.05) independent variables in our multivariable regression model. Furthermore, age, gender and years of service accounted for only 37.4 % of the variance in the number of critical incidents among firefighters.

Conclusion: In this study, 96.4 % of firefighters have been exposed to some type of critical incident over the span of their entire firefighting careers. In addition, age, gender and years of service had moderate predictive values in the number of critical incidents among firefighters.

P162: Sleep Quality of Canadian Public Safety Personnel and Its Relationship with Mental Disorder Symptoms

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University of Regina

Introduction: Lower sleep quality has been associated with numerous mental and physical health concerns, including depression, anxiety, and poorer overall physical health (Baldwin et al., 2001; Strine & Chapman, 2004). Sleep problems are commonly reported by American military veterans, police officers, and other first responders, and may contribute to the risk of developing mental disorders like posttraumatic stress disorder (PTSD), or exacerbate comorbid mental disorder symptoms (Marmar et al., 2006; McLay, Klam, & Volkert, 2010). Sleep difficulties may be particularly prevalent in public safety personnel (PSP) due to routine work environment stress (Marmar et al., 2006), but may also be a function of shift work. The current investigation was designed to provide estimates of sleep difficulties among Canadian PSP and explore the relationship between sleep quality and mental health status.

Methodology: PSP completed validated screening measures for sleep quality and diverse mental disorders through an online survey made available through PSP agencies between September 2016 and January 2017. Respondents (5813; 32.5% women) were grouped into six categories: call center operators/dispatchers, correctional workers and officers, firefighters, municipal/provincial police, paramedics, and Royal Canadian Mounted Police (RCMP).

Results: A substantial proportion of PSP in each category reported symptoms consistent with clinical insomnia (48.9%–59.5%). Sleep quality differed among PSP categories, such that all PSP except municipal and provincial police reported greater sleep difficulties than firefighters, and RCMP reported greater sleep difficulties than municipal and provincial police, Welch's $F (7, 187.77) = 6.37, p < .001$, w = .08. Sleep quality was correlated with screening measures for PTSD, depression, anxiety, social anxiety disorder, panic disorder, and alcohol use disorder in all PSP categories (rs = .14 – .71, ps < .01). PSP who screened positive for insomnia were 3.43 to 6.96 times more likely to screen positive for another mental disorder (ps < .001).

Conclusion: Sleep difficulties appear to be a prevalent concern for Canadian PSP. PSP reported varying degrees of sleep quality, with the highest difficulties found among RCMP, paramedics, correctional workers, and call center operators/dispatchers. Sleep difficulties were associated with numerous mental disorder symptoms, suggesting sleep quality may be an important factor in PSP mental health. Sleep quality should be an imperative consideration in treatment settings and workplace policy (e.g., mandatory sleep hygiene education, shift work regulations).

P163: Views and Opinions Regarding Mental Illness and Treatment in Canadian Firefighters

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[1]Queen's University; [2]University of Regina

Introduction: Stigma surrounding diagnosis of, and treatment for, a mental health illness is often a barrier for people who may want, or know that they need, help with a mental health issue. Research has shown that firefighters may avoid help as a result of the stigma that labels anyone who seeks mental health treatment as "weak and not a real firefighter because they are unable to handle the stresses of the job". The current study was designed to: (1) examine views and opinions of Canadian firefighters regarding mental illness; and (2) examine whether firefighters themselves would access mental health treatment if they thought they required it

Methodology: Data were collected by the Canadian Institute for Public Safety Research and Treatment using a web-based survey procedure, and included 1,217 firefighters. The survey tools included established self-report measures for various mental health symptoms, and standardized questionnaires on mental health knowledge –the Mental Health Knowledge Schedule (MAKS), and stigma, the Opening Minds Survey for Workplace Attitudes (OMSWA).   Analyses included descriptive and non-parametric bivariate statistics.

Results: Respondents were 84.1% male. Only 19.2% of respondents agreed with the statement "most people with mental health problems go to a healthcare professional to get help", and when asked if they considered different conditions to be mental illnesses, 97.8%, 93.9% and 92.5% agreed that schizophrenia, depression, and PTSD were mental illnesses respectively, but only 52.7% believed stress was a mental illness. 80.3% of individuals disagreed with the statement "I would try to avoid a co-worker with a mental illness", yet 28.9% stated that if they knew a co-worker had a mental illness they would not date them". 80.3% of respondents stated that if they developed a mental illness in the future they would seek health treatment from a professional. There are statistically significant differences between male and female firefighters attitudes towards individuals with mental illness and their desire the seek help, and differences depending on their personal experience with mental illness.

Conclusion: Male and female Canadian firefighters have slightly different opinions regarding mental illness and mental health. In general individuals report positive attitudes towards mental illness and mental health treatment, but there are significant differences between males and females, and some stigma still exists regarding mental illness.

P164: The Occupational Awareness Training Movement: Helping clinicians understand and Treat First Responder trauma

Johnston, Matthew, MEd

Centered Lifestyle Services (1148810 BC Ltd.)

Brief Description: Addressing Clinician Competency:

Based on many years of feedback across provincial fire fighter associations, fire fighters often claim that mental health clinicians do not adequately understand the nature of their work and daily reality. This issue is compounded by the fact that many fire fighters only access therapy once a lasting personal challenge morphs into a debilitating crisis that requires a multi-faceted services approach. Without a doubt, this perceived cultural divide between therapist and client can often thwart the development of an adequate therapeutic alliance. This situation often leads fire fighters to withdraw from counselling prematurely and can perpetuate a felt sense of hopelessness within the struggling individual.

Occupational Awareness Training for Therapists Overview:

Occupational Awareness Training for Therapists is a program that provides clinicians the core competencies required to work with first responders. Through this program, clinicians can expect to:

- Enhance their understanding of the modern aspects of a stoic first responder sub-culture
- Increase confidence in establishing rapport with first responder clients
- Understand the unique presentation of mental health challenges of a first responder
- Increase understanding of occupational stress injuries and client perception of trauma
- In-depth review of evidence-based treatment strategies that have proven efficacy with the first responder population
- Extensive review and discussion of the DSM-V criteria for Trauma- and Stressor-Related Disorders as they relate to a first responder population
- Enhance clinician confidence in establishing treatment goals and course of treatment

Clinical Outcomes: When asked, the following:

On a scale of 1 to 5, how would you rate this course?
44 respondents rated the course as 4.64.

Would you recommend this course to your peers?
97.7% of respondents said yes.

A wide variety of qualitative data has also been collected and the vast majority of feedback has been very positive and helpful for the future development of more advanced course offerings.

Patient Population: The patient population is specific to Canada's fire fighters. However, much of the content applies to members of all first responder organizations including policing, paramedics, dispatchers, corrections and border services members.

Conclusion: The recent advances in legislation (provincially and federally) has demonstrated a substantial need to provide pragmatic training and skill development opportunities for mental health clinicians and other health care professionals. When first responders reach out for support, there needs to be a vetted network of health care professionals working together to maximize recovery and post-traumatic growth.

P165: Key Aspects of Leadership in Volatile, Uncertain, Complex, Ambiguous Environments for Organizational Performance and Mental Health

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University of Regina

Brief Description: Researchers have used the continuous improvement/learning organization construct to explain various organizational performance issues associated with operating in a volatile, uncertain, complex, ambiguous (VUCA) environment. Various researchers have concluded that to be effective, leadership in these VUCA environments needs to create psychologically safe teams that support individuals to work through errors, mistakes and problems and thereby learn more effective ways to cope with environmental changes. In addition to performance issues, military and public safety organizations operating in VUCA environments also must deal with operational stress injuries, including anxiety disorders. In this presentation we review the literature on anxiety, leadership, and learning organizations to identify key dimensions of team psychological safety. We also need to offer a

reconceptualization of psychological safety as it pertains to both performance and mental health. Building upon the psychological safety view of leadership for organizational learning and performance, we advance a model outlining the conditions where strategic vision and coaching help the organization to realize individual and organizational performance potential and psychological resilience. We also need to support individuals to more effectively cope with anxiety-inducing situations. The presentation will then introduce an approach to leadership development based on the available results from the literature. The presentation will then conclude with recommendations for testing the hypothesized relationships between the proposed leadership development, leader actions, team psychological safety, organizational performance, and mental health.

Clinical Outcomes: Based on measures extracted from a review of the research literature into leadership, psychological safety, learning organizations, and uncertainty and anxiety, participants in the proposed training will be assessed on their ability to identify key elements of team psychological safety and coaching practices that support team psychological safety. They will then be assessed on the extent to which they apply these practices within extant work teams and its subsequent impact on team psychological safety, team learning behavior, and anxiety.

Patient Population: Provides evidence-informed leadership development recommendations for serving members of first responder/ public safety organizations.

Conclusion: Existing research has shown that specific coaching behaviors are correlated with increased psychological safety, learning in uncertain volatile environments, and team performance. These coaching behaviours should be trainable, and when transferred to a public safety or military context, should lead to both enhanced performance and improved mental health within the team.

P166: Latent Factors Underlying Trauma, Burnout, and Compassion Fatigue: Data from Canadian Paramedics

*Shields, Robyn, BA[1,2]; Taylor, James, PhD[1]; Murdoch, Douglas, PhD[1]

[1]Mount Royal University; [2]Alberta College of Paramedics

Introduction: The constructs posttraumatic stress disorder (PTSD), secondary traumatic stress, burnout, and compassion fatigue have substantial conceptual overlap, with the terms being used somewhat interchangeably and their definitions being altered without justification for change (Meadors, Lamson, Swanson, White, & Sira, 2010). Adding to the conceptual confusion, the DSM-5 diagnosis for PTSD (APA, 2013) now includes secondary exposure to trauma, potentially removing the need for terms like secondary traumatic stress and compassion fatigue. From a theoretical perspective, it would be of value to arrive at a clear conceptual picture of the latent factors underlying the measurement instruments for these constructs.

Paramedics work in a capacity that is likely to elicit PTSD both directly and through secondary exposure, and they are known to have a high comorbidity of burnout and PTSD (Berger et al. 2012). Workers' compensation in some provinces covers paramedics for PTSD, but not for the other constructs above (secondary traumatic stress, burnout, compassion fatigue). Seeking recognition of other conditions for coverage would be facilitated if the underlying structure of the space were better understood.

Methodology: Full-time Canadian paramedics (*n* = 322) were recruited through social media sites and completed the PTSD Checklist, the Secondary Traumatic Stress Scale, the Professional Quality of Life Scale, the Oldenburg Burnout Inventory, and the Copenhagen Burnout Inventory in an online survey.

Results: An exploratory factor analysis with oblique rotation was conducted. Four clear factors emerged: an intrusions and avoidance trauma factor, an exhaustion factor, a compassion-satisfaction factor (with potential protective effects with respect to some forms of exhaustion), and an anhedonia factor.

Conclusion: The latent structure uncovered in the analysis leads to two conclusions. First, exhaustion is separable from trauma (indexed by intrusions and avoidance) and from anhedonia, suggesting the need to consider including burnout for workers' compensation coverage (in addition to PTSD). Second, encouraging paramedics to reflect on the value of their work may provide protection against some aspects of exhaustion.

P167: Use of the PTSD Checklist in Canadian Paramedics: Comparison of the PCL-5 with the PCL-C

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Introduction: In the most recent version of the DSM (5th ed.; APA, 2013), changes were made to the diagnostic criteria for posttraumatic stress disorder (PTSD). These changes led to the revision of a commonly used PTSD screen - the PTSD Checklist (PCL). The new version, the PCL-5 (Weathers, Litz, Keane, Palmieri, & Schnurr, 2013), directs respondents to focus on a single traumatic event when responding to questions, in contrast with the previous version, the PCL-C (Weathers, Litz, Huska, & Keane, 1994), which allowed respondents to consider an array of events when responding to questions. The focus on a single traumatic event could pose problems for populations, such as paramedics, in which PTSD is not due to a singular event, but rather to the accumulated trauma caused by many events. Due to their high risk to develop PTSD (Donnelly, Bradford, Davis, Hedges, & Klingel, 2016), it is important that changes to a PTSD screening tool not disadvantage the paramedic population by inappropriately decreasing the rate of positive screens.

Methodology: Full-time Canadian paramedics (*n* = 322) were recruited through social media sites and completed both the PCL-C and PCL-5 in an online survey.

Results: The positive screen rate of the PCL-5 was statistically significantly lower than that of the older PCL-C. The decrease was largely due to decreases in meeting the cut-score threshold and to decreases in satisfying the avoidance criteria (which differed between versions).

Conclusion: The PCL-C had at least 30% greater odds of positively screening for PTSD in this sample, which raises concerns for the use of the PCL-5 as a screening tool for paramedics. Creating population-specific screening criteria for the PCL-5 in order to reflect the different populations to which the measure is being applied is recommended.

P168: Effects of Work-acquired Potential Trauma on the Lives of Canadian Public Safety Personnel

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Introduction: Public safety personnel (PSP) in Canada includes correctional officers and workers, dispatchers, firefighters, paramedics, and police officers. PSP are regularly exposed to potentially traumatic events due to the nature of their work. The immediate and long-term impacts of chronically experiencing and witnessing life threatening events is not well understood, particularly in the Canadian context. We present data that explores the effects of work-acquired trauma as reported by Canadian PSP.

Methodology: A web-based, self-report survey was made available in English and French to a range of PSP across Canada. The survey included several well-established evaluations used to screen for mental health symptoms, as well as several open-ended questions to further explore the experiences of work-related trauma for each of the participants. The comments provided in the survey, in response to a request for participants to provide final comments if desired, was the data analyzed for the current study. Participants were recruited through employers, professional associations, researchers, and with video support from the federal Minister of Public Safety and Emergency Preparedness. Inductive analysis was used to develop emergent themes; all data were coded to represent all emergent themes.

Results: Over 9000 PSP representing diverse professions across Canada participated in the survey, 828 of whom voluntarily provided additional comments. Several themes emerged from the data regarding the effects of persistent exposure to work-acquired trauma. Themes included: sense of recovery; effects on family; and effects on self. Many participants indicated that, at the time of the survey they were doing quite well, but that they had struggled in the past. Participants also described their work as significantly impacting their family, causing particular strain on their parental or partner relationships. The effects of exposure to potentially traumatic events appear readily understood as impacting physical self, psychological self, and social self.

Conclusion: Our results represent an important initial step towards better understanding the effects of work-acquired trauma on the lives of Canadian PSP. Through written information provided by a wide range of PSP, we have identified several important themes including a sense of recovery, effects on family, and effects on self. The results are important foundational work to identify specific gaps in the current knowledge regarding the impact of trauma on the mental health and well-being of PSP. Identifying and understanding the gaps will be vital for developing evidence-based, trauma-informed education and supports tailored to the unique needs of PSP.

P169: Gender and Corrections: A breakdown of mental disorder symptoms

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[1]University of Manitoba; [2]Queen's University; [3]Memorial University of Newfoundland; [4]University of Regina

Introduction: The mental health of public safety personnel in Canada is a national priority. In a recent survey of public safety personnel, 54.6% of correctional workers screened positive for a recent mental disorder. Although women had 1.54 higher odds of screening positive than men did, the study concluded there was no difference in the percentage of male and female correctional workers who screened positive. However, the study did not look at gender differences within each mental disorder specifically, nor did they describe gender-specific differences in trauma experience.

Methodology: A convenience sample of correctional workers completed a web-based survey 01/09/2016-31/01/2017 as part of a larger study of public safety personnel mental health. Participants were screened using self-report measures for a number of mental health symptoms, including PTSD, depression, anxiety, and alcohol use disorders. Demographic information such as age, education, and self-identified gender were collected, as well as specific details around employment. The percentage of correctional workers who screened positive for each mental disorder and trauma experience will be reported stratified by gender. The effect of gender on positive mental disorder screening will be evaluated using multivariable modified Poisson regression, adjusting for relevant covariates. Interactions between gender and age, correctional role, and years of experience will be explored.

Results: TBD

Conclusion: The number of women working in corrections has increased. Understanding gender differences in mental health are critical to understanding the occupational environment that correctional workers exist within and to designing appropriate and accessible mental health support services.

P170: Does Anger Predict Posttraumatic Stress Disorder and Problematic Alcohol Use in Canadian Public Safety Personnel?

Paluszek, Michelle, BA; Thorisdottir, Audur, MSc; Carleton, R. Nicholas, PhD; Asmundson, Gordon, PhD

University of Regina

Introduction: Stressful work environments where there is frequent exposure to potentially traumatic events increase the risk of developing posttraumatic stress disorder (PTSD) and alcohol use problems. Problematic anger has been identified as a prominent risk and maintenance factor for mental health difficulties in the aftermath of trauma in civilian and military populations (Forbes et al., 2015; McHugh et al., 2012), but limited research exists on the effect of anger on PTSD and alcohol use problems in public safety personnel (PSP). The purpose of this study was, therefore, to examine whether anger predicted PTSD and alcohol use, while controlling for the possible confounding effects of depression and biological sex, in a sample of Canadian PSP.

Methodology: Participants were 5813 PSP (68% male) who completed a nation-wide online survey on mental disorders. Self-report questionnaires were used to assess symptoms of PTSD and depression, anger, and problematic alcohol use (Carleton et al., 2017). Data were analyzed using two-stage hierarchical regressions with PTSD and alcohol use as the dependent variables. Biological sex and symptoms of depression were entered at the first stage and anger at the second.

Results: Approximately 17% of the sample reported experiencing problematic anger. Significant associations were found between anger and PTSD, while controlling for the effects of depression and sex, $F_{(3, 5212)}$ = 1517.02, $p < .001$, $R2 = .47$; anger uniquely explaining 10.6% of the total variance in PTSD. Anger also significantly predicted alcohol use, when controlling for depression and sex, $F_{(3, 4518)}$ = 108.19, $p < .001$, $R2 = .06$, although the unique contribution of anger in this model was only 2.3.%.

Conclusion: The results indicate that problematic anger is prevalent among Canadian PSP; underscoring the importance of screening independently for anger as part of a mental health assessment, to reduce the risk of PTSD, and to some extend problematic alcohol use. The results, further have clinical implications for PTSD treatment. Specifically, target-

ing anger directly, above and beyond PTSD symptoms, in treatment for posttraumatic stress could be beneficial for treatment effectiveness.

P171: The Impact of Anger and PTSD on Marital Satisfaction in Canadian Public Safety Personnel

*Lewis, Jamie, BA; Thorisdottir, Audur, MSc; Carleton, R. Nicholas, PhD; Asmundson, Gordon, PhD

University of Regina

Introduction: Canadian Public Safety Personnel (PSP; e.g. fire fighters, police officers) are regularly exposed to traumatic events in the course of their work, making them more susceptible to posttraumatic stress disorder (PTSD). Anger is a risk factor for developing PTSD but also a prominent feature of the disorder. Anger may compromise intimate relationships, which are important sources of social support that promote resilience and PTSD recovery. The purpose of the current study was to examine the influence of anger on the relationship between PTSD and marital satisfaction, while controlling for the confounding effects of depression.

Methodology: The sample included 5813 Canadian PSP (68% male) who participated in a large-scale online survey on mental disorders. Symptoms of PTSD, anger, depression and martial satisfaction were assessed using self-report measures. Data were analyzed using a three-stage hierarchical regression with marital satisfaction as the dependent variable. Depression was entered in the first stage, PTSD in the second, and anger in the third.

Results: The model was statistically significant, $F(3, 3974) = 80.68$, $p < .001$, and higher anger (b = -.15) was a statistically significant predictor of lower marital satisfaction. The addition of anger in the model explained additional 6% of the variation in marital satisfaction, beyond PTSD and depression.

Conclusion: The results suggest that targeting anger in PTSD screening and treatment may be helpful to improve marital relationship satisfaction, an important source of social support and protective factor for PTSD.

MIXED MENTAL AND PHYSICAL HEALTH & WELL–BEING

Podium Presentations

1D01: Canadian Public Safety Personnel Health Research: Ongoing results from the 2017 pan-Canadian survey

*Carleton, R. Nicholas, PhD[1]; Afifi, Tracie, PhD[2]; Taillieu, Tamara, MSc[2]; Turner, Sarah, MSc[2]; El-Gabalawy, Renée, PhD[2]; Sareen, Jitender, PhD[2]; Asmundson, Gordon J. G., PhD[1]

[1]University of Regina; [2]University of Manitoba

Introduction: Canadian Public Safety Personnel (PSP; e.g., correctional service workers and officers, dispatchers, firefighters, paramedics, police officers) are regularly exposed to potentially traumatic, painful, and injurious events. Recent results indicate PSP may have particularly high levels of mental health disorders. The exposures and mental health disorder symptoms may also increase PSP risk for developing musculoskeletal difficulties and chronic pain.

Methodology: Data were collected using web-based survey available in English or French from September 2016 to January 2017. Participants

for the current results included more than 5000 PSP recruited based on several strategies (e.g., email invitations from the Canadian Institute for Public Safety Research and Treatment). The survey tools included assessments of chronic musculoskeletal pain and suicidal behaviours (i.e., ideation, planning, attempts). Analyses included descriptive statistics and logistic regression models.

Results: PSP estimates of chronic pain ranged from 35.3% to 45.4%, with 24.5% to 54.4% attributing their pain to a work-related injury. Substantial proportions also reported past-year and lifetime suicidal ideation (10.1%, 27.8%), planning (4.1%, 13.3%), or attempts (0.4%, 4.6%). There were significant differences ($ps<.05$) in reports of chronic pain and suicidal behaviours across the categories of PSP, as well as significant correlates ($ps<.05$) with diverse demographic variables (e.g., sex). The highest proportions of participants reporting chronic pain and suicidal behaviours were in the paramedic and correctional worker groups.

Conclusion: There appears to be important evidence that PSP experience challenging levels of chronic pain and suicidal behaviours. The results support recent calls for a national action plan to address PSP health challenges. Investments in support systems for mental health should be augmented by research and interventions for managing chronic pain and suicidal behaviours.

3D03: A Qualitative Study on Firefighters´ Work Health Priorities

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[1]Western University; [2]McMaster University; [3]University of Prince Edward Island; [4]Hamilton Professional Fire Fighters Association; [5]Vancouver Fire and Rescue Services; [6]Thunder Bay Fire Rescue; [7]Fire Service Women Ontario; [8]Red Deer Emergency Services; [9]Montreal Firefighters Association

Introduction: Firefighters provide essential services that require high intensity performance in stressful situations. The demands of shift work, physical exertion and exposure to critical events can place firefighters at risk of injury and gradual onset of physical and mental illness.

The objective of this study is to identify and prioritize firefighters' needs for research that will help improve their work health.

Methodology: Fifty-two firefighters (42 males, 10 females) from fire services across Canada (Alberta, Atlantic Canada, British Columbia, Nunavut, Ontario, Quebec) were interviewed using a semi-structured guide. The phone interviews were recorded and transcribed verbatim. Descriptive content analysis was used to identify themes from the participants' responses.

Results: General health and muscle sprains and strains (back, shoulders, knees) were the firefighters' most common mentioned health concerns. The impact of musculoskeletal (MSK) injuries on firefighters' ability to do job tasks and the negative effect on family and daily life were concerns. Physiotherapy was identified as a needed service to manage MSK injury. The unpredictable work environment of the fire service was acknowledged as a barrier in preventing MSK injuries.

Exposures to traumatic events such as calls involving children or multiple casualties were seen as the major source of mental health injuries. Many participants stated the importance of peer support in coping

with these stressors. The "macho mentality" of the firefighter culture and the stigma associated with mental issues were recognized as major barriers in preventing mental health injuries and getting help when needed. Many participants discussed bringing job stress home and its influence on family relationships.

Difficulty in accessing professional help and its associated financial costs were identified as challenges in the prevention and treatment of both MSK and mental health injuries. Firefighters expressed the need to develop and tests treatment programs and services that were adapted to their specific needs.

Conclusion: Firefighter-specific musculoskeletal and mental treatment programs that can be accessed at minimal cost are priorities for firefighters. Preparedness programs that help mitigate the impact of critical events and strain injuries might consider family impact.

Poster Presentations

P158: A Structured Review of Health Information on Firefighter Websites

*Hu, Mostin[1]; *MacDermid, Joy, PhD[1, 2]; Killip, Shannon, BSc[1]*

[1]McMaster University; [2]Western University

Introduction: Firefighting involves many occupational hazards which increase firefighters' risks for health issues such as musculoskeletal injuries, cancer, and post-traumatic stress disorder. Access to health information specific to firefighters' needs is essential, but there is no research on the accessibility of health and safety resources on firefighter employer and union websites.

The objectives of this study are: 1) To search and catalogue the information resources available on Canadian firefighter websites; 2) To identify gaps in the online health resources available to firefighters in order to guide future electronic resource creation and sharing.

Methodology: We searched for the websites of 533 Canadian fire service organizations (departments and union/associations at the international/national, provincial, and local levels) using Google (July 2017). Data was extracted and collated to describe the nature of the health resources in terms of their health focus and format.

Results: A total of 313 websites were identified and reviewed, 41 of which contained applicable health information. There were a total of 128 resources on firefighter mental (46%), physical (34%), and work health (20%). Resources were most dense on the international/national websites (13 resources/website) and least dense on local websites (1 resource/7 websites). General mental health (34%), post-traumatic stress disorder (24%), and suicide (24%) were the most prevalent topics in mental health resources, while half (49%) of all physical health resources were on cancer. Ontario, Québec, and British Columbia were key contributors, accounting for 81% of resources found on the provincial/local level. No resources from Northern Canada were found. Musculoskeletal health was not mentioned in any resources identified.

Conclusion: While pockets of excellent information to support firefighter health are available, there are substantial gaps and a clear lack of coordination of resources, since the focus of health information is highly variable across firefighter websites. Quality evaluation and coordination of resources are needed to advance firefighter health.

P159: Using Streaming Big Data for Resilience Assessment within Pre-service Firefighter Extreme Condition Training

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Introduction: Pre-Fire students undergo training to prepare for careers in firefighting. Traditional pre-fire training has focused on the development of task-based skills required for activities such as firefighting and automobile extraction. Additional training is provided for areas such as fitness development. Resilience training as a means of mental health development is being integrated into military training. There is great potential for Pre-Fire training to be enriched within resilience training. Physiological assessment during training has shown potential as a means to assess resilience during tactical operator training. There is great potential to assess physiological data obtained during Pre-Fire training to assess resilience on an individual basis.

Methodology: The study population for this research is Pre Fire students within the Durham College Pre-Fire Service program's completing the Environmental Stress Workshop's Hot Maze. The Hot Maze scenario consists of two phases, the first phase is performed in ambient weather conditions and the second phase in performed in the University of Ontario Institute of Technology's Automotive Centre of Excellence large climatic chamber (LCC) at 60 . This simulates entering a burning building, which puts a lot of real-world stress on trainees. The first phase of the scenario consists of tasks to: 1. dismount the fire truck and don SCBA; 2. Pull a charged hose line; and 3. Perform a forcible entry simulation. During the second phase they perform a search and rescue in a two-storey structure within the LCC. Students wear a Hexoskin vest to monitor physiological parameters including electrocardiogram with derived heart rate and breathing rate. Physiological data is synchronised with information from the scenario and analytics are performed using Grossman's heart rate analysis for fear and psychological arousal derived from his research with military populations.

Results: Our initial results will demonstrate the potential of this approach to provide personalised precision resilience assessment. We will further demonstrate early work on our resilience analytic models to reporting on the trainees' resilience to various elements within the scenario.

Conclusion: Applying Big Data techniques to improve the analytics of the trainees resilience has the potential to provide more wholistic training for Pre-Fire students preparing for a career in firefighting. These new approaches to training also have the potential to create new advanced analytics to detect physiological changes that may provide information of the stress impact of the training activity on the trainee and could be used to develop resilience through repetition of the training scenario.

PRIMARILY PHYSICAL HEALTH & WELL–BEING

3D05: The Extra Burden: Accounting for external firefighter loads using digital human modeling for ergonomic assessments

Kajaks, Tara, PhD[1]; MacDermid, Joy, PhD[1, 2]; Galea, Vickie, PHD[1]; Vrkljan, Brenda, PhD[1]

[1]McMaster University; [2]Western University

Introduction: Military personnel and first responders, including firefighters, are at a high risk of sustaining a musculoskeletal injury given

work characteristics that include strenuous physical demands, hazardous work environments, and the donning of heavy personal protective equipment (PPE). These same work characteristics also present challenges in conducting traditional field-based ergonomics assessments of high injury risk tasks. The use of virtual ergonomic technologies may offer a solution to these challenges. In this study, an ergonomic assessment protocol was developed using biomechanical modeling and virtual ergonomic tools to account for body-borne loads of firefighters, including PPE and a self-contained breathing apparatus (SCBA). The protocol was used to conduct an ergonomics assessment of the firefighter high-rise pack lift task.

Methodology: Twelve firefighters (6 female) in full PPE (25.8 kg), including an SCBA (17.5 kg), were observed using a Microsoft Kinect 3D camera as they picked up a 19.5 kg high-rise pack from the ground. The biomechanical modeling of the SCBA loads was derived from models used to estimate rucksack trunk and shoulder loads in the Canadian military. Motion capture data from the initial contact phase of the task was used to posture virtual firefighter manikins using two ergonomics software programs: Jack and 3DSSPP. Ergonomics tools within these software (Static Strength Prediction, the NIOSH Action Limit, and OWAS) were used to assess injury risk with and without the estimated contribution of the SCBA.

Results: Overall, seven of eight posture evaluations identified that the observed task phase presented high injury risks to the firefighters, particularly after including the estimated SCBA load. However, different posture acceptability (i.e. safe vs. unsafe) was observed between the software, the ergonomics tools, and the external load biomechanical modeling. The OWAS tool was the most conservative measure, followed by the NIOSH, and SSP tool.

Conclusion: The results support the anecdotal evidence of high injury risk when performing the high-rise pack lift task from the ground level, as well as the importance of accounting for the external loads caused by PPE when assessing injury risk. The challenges and opportunities in using virtual ergonomics tools, including 3D data streaming and external force considerations, for the evaluation of first responder injury risk factors are also highlighted. Potential also exists to use this protocol to evaluate task and equipment-related injury risks in military personnel.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

5D03: Refreshing Sleep before and after Work-related Concussion/Mild Traumatic Brain Injury: Sex differences

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[1]University of Toronto; [2]Toronto Rehab-University Health Network; [3]Ontario Network of Injured Workers Group; [4]Laurentian University

Introduction: Disturbed sleep is a common symptom in both the acute and chronic phases after mild traumatic brain injury (mTBI) / concussion, and it persists in many patients over time. Recent clinical studies have started disentangling the physiological, behavioural, and environmental components of persistently disturbed sleep post-concussion, identifying age, post-injury depression, previous head trauma, use of certain medications, and wake time variability as covariates. Clarifying the complex interplay between comorbid disorders, behavioural and psychosocial factors, through sex/gender lens, before and after the injury, will provide new insights into the processes underlying post-traumatic sleep changes in persons with mTBI.

Methodology: Sixty-six participants (50% male, aged 30-50 years, median 155 days post injury) who sustained work-related concussion/mTBI and who continued to experience functional limitations long after their injury were studied. The clinical, diagnostic, and claim-related variables covering the period from pre to post injury were collected from the medical and insurer files for each participant. Occupational variables were gathered from the employer's report of injury/illness, and other relevant forms. To quantify the independent association between changes in refreshing sleep from pre- to post injury and other factors, selection of variables was based on the literature and a priori-defined hypotheses. Generic and sex-specific logistic regression models were fitted with a priori hypothesized variables.

Results: Forty-seven participants (79% of men, 64% of women) perceived their sleep as being refreshing before injury and unrefreshing afterwards ($\chi^2 = 67.70$ for change, $\chi^2 = 27.6$ for women and $\chi^2 = 41.1$ for men, $p < .0001$). Post-concussive losses in refreshing sleep were associated with variables from all of the hypothesized categories. The sex-specific logistic regression models emphasized mood disorder among women and substance use disorder among men. In men only, refreshing sleep loss was associated with fatigue and diminished functional capacity.

Conclusion: Persons with concussion/mTBI experience statistically significant and clinically meaningful losses in refreshing sleep. Associations with daytime functional capacity, self-and clinician-assessed, advances our understanding on the topic of post-concussive recovery and functioning, and uncovers, once again, the unity of brain circuits controlling sleep and those that subserve mental and behavioural responses. Identified sex differences in covariate effects and functional outcomes support consideration of sex/gender in further characterizations of refreshing sleep in mTBI/concussion.

SERVING MEMBERS

HEALTH POLICY

Podium Presentations

6A03: Risk Factors Associated with Sexual Misconduct in the Canadian Armed Forces: Does it vary by sex and environmental command?

*Hajizadeh, Mohammad, PhD; Aiken, Alice, PhD

 Dalhousie University

Introduction: Sexual assault, inappropriate sexual and discriminatory behaviours, gender discrimination, and sexual harassment represent serious social and public health issues with long reaching repercussions on victims. Collectively referred to as sexual misconduct, these illegal or inappropriate behaviours are found to be a key contributing cause of sexual health problems, substance abuse, depression, and post-traumatic stress disorder [PTSD] in civilian and military populations.

Methodology: We used newly available unique dataset from the Survey on Sexual Misconduct in the Canadian Armed Forces (SSMCAF) (n=43,440 active members), conducted by Statistics Canada in 2016, to determine risk factors associated with the experience of the three types of sexual misconduct, defined as sexual assault, inappropriate sexualized behaviour, and discriminatory behaviour on the basis of sex and sexual orientation or gender identity in the Canadian Armed Forces (CAF). We used logistic regression models to identify predictors of being a target of sexual misconduct among CAF members. We also examined whether risk factors associated with the three types of sexual misconduct vary by sex and environmental command.

Results: Our descriptive results suggested that the proportions of CAF members who experienced sexual assault, inappropriate sexualized behaviour, or discriminatory behaviour on the basis of sex and sexual orientation or gender identity in the past year were 2%, 18.4% and 5.9%, respectively. The probabilities of being the target for sexual assault, or inappropriate sexual behaviour and discriminatory behaviour in the past year among females, was 1.83% (95% confidence interval [CI] = 1.67 to 2), 12.79% (95% CI = 12.01 to 13.57) and 6.35% (95% CI = 6.02 to 6.69), respectively, higher compared to their male counterparts. The probabilities of experiencing one or more of the three types of sexual misconduct in the past year were associated with one or more of the following factors; younger, single, Indigenous, disabled, LGBT (lesbian, gay, bisexual or transgender), highly educated, or junior non-commissioned members of the CAF. Our findings were generally consistent when we stratified our analysis by sex and environmental command.

Conclusion: These results suggest that sexual misconduct is a problem within the CAF. There is a need for change within the CAF to prevent and reduce sexual misconduct among at-risk members including those who are female, young, single, Indigenous, disabled, LGBT, highly educated or junior non-commissioned members.

Poster Presentations

P136: Veteran Income and Employment in Canada

MacLean, Mary Beth, MA; *Roach, Mary Beth, MBA, MA; MacLean, Linda, MSc; Keough, Jacinta, BA

Veterans Affairs Canada

Brief Description: At Veterans Affairs Canada (VAC), well-being has long been the desired outcome for Veterans. Under VAC's well-being construct, enabling well-being involves taking action in seven domains to ensure, along with other outcomes, that Veterans are financially secure and are employed or engaged in activities meaningful to them.

VAC has a long history of providing financial support and re-establishment benefits to Veterans of the First and Second World Wars, the Korean War, and Post-Korean War Veterans. Benefits have evolved over time to meet the changing needs of Veterans and their families. This presentation will provide an overview of:

- the history and evolution of income support benefits available to Veterans in Canada since 1919;
- income and employment among Veterans today; and
- the role that finances and employment have on the adjustment to post military life, including the relationship between finances and employment.

Clinical Outcomes: Data from the Life After Service Studies 2010, 2013, and 2016 surveys and income tax record linkage data covering Veterans released since 1998, are primarily used to describe income and employment among Veterans today as well as the role that finances and employment have on the adjustment to post military life.

Patient Population: The data indicates that:

- the incomes of Regular Force Veterans initially declined after release but recovered and surpassed pre-release income; low income rates were half that of the general Canadian population; variations were found across sub-groups.
- most Regular Force Veterans were employed after release and satisfied with their work; variations were found across sub-groups.
- a significantly lower prevalence of difficult adjustment was found among veterans who were employed, were satisfied with their finances, satisfied with their job and a significantly higher prevalence was found among veterans who were unemployed, not in the labour force, or unable to work, not satisfied with their job or main activity, those experiencing low income, and those not satisfied with their finances.

Conclusion: Ensuring the well-being of Veterans and their successful adjustment to post military life requires strategies across all the domains of well-being with particular strategies focused on finances and employment. Supports based on the principles of modern disability management and the involvement of multiple partners beyond government are required to assist Veterans to be financially secure by supporting employment and attachment to the labour force while providing financial assistance when this is not possible. Finding the right balance is key.

HEALTH SERVICES

Podium Presentations

1A01: The Experiences of Occupational Therapists Working with Canadian Armed Force Members and Veterans (1 of 5)

*Lee, Jennifer, PhD; Coulthard, Julie, PhD

Department of National Defence

Introduction: With its emphasis on assessment and intervention to

facilitate individuals' engagement in occupational or other meaningful activities, occupational therapy can play a key role in the vocational rehabilitation and longer-term outcomes of military personnel and veterans with an illness or injury. The present study was conducted to better understand the experiences of occupational therapists working with Canadian Armed Forces (CAF) or veteran populations and to identify the various factors that may influence their work.

Methodology: A series of in-depth, semi-structured interviews were conducted with 13 occupational therapists working in various capacities with CAF members or Veterans Affairs Canada (VAC) clients, including occupational therapists employed by the Department of National Defence (DND), Field Occupational Therapy Service Officers, and occupational therapists providing services to veterans through a contract. All interviews were conducted by telephone and lasted between 20 and 60 minutes. They were audio-recoded, transcribed, and subjected to a thematic analysis.

Results: Results to date have underlined eight reoccurring topics of discussion across the interviews, including: occupational therapists' professional background and preparedness for their role; the nature of their role and the various organizational factors that shape it; their collaborations with other health professionals and experiences with clients; and various challenges or benefits they have encountered through working either within or for DND or VAC. Additional analyses are currently being conducted to identify more specific themes across each of these topics.

Conclusion: Occupational therapists are providing services in a number of capacities to CAF members and VAC clients. Results of this study will help underline aspects of occupational therapy that are unique to working with these populations and shed light on some of the skills and values that may help occupational therapists excel in their practice in this context.

1A03: Exploring Canadian Armed Forces Members' Awareness of Programs Available to Ill and Injured Members by Rank Group, Years of Service, and Component (3 of 5)

Daugherty, Carina, MA; Peach, Jennifer, PhD; Berlinguette, M. Katharine, MSc

Department of National Defence

Introduction: Treating ill and injured members is a Defence priority. However, Canadian Armed Forces (CAF) members must be aware of the resources available in order to access them. We explored: (1) whether awareness of programs available to the ill and injured increased over time; (2) whether awareness of programs increased with greater exposure to the military (i.e., higher ranks or more years of service); and (3) whether awareness of programs differed between Regular Force and Primary Reserve members using data from the Spring 2013, Fall 2014, and Fall 2017 Your Say Surveys (YSSs).

Methodology: Regular Force CAF members were asked to rate their awareness of programs available to the ill and injured. Using data from the Spring 2013 ($N = 1,585$) and Fall 2014 ($N = 1,741$) YSSs, we assessed whether awareness increased over a one year period using weighted data and creating a complex samples data analysis plan. More recent results from the Fall 2017 ($N = 2,795$) YSS included CAF members from the Regular Force and the Primary Reserve. We analyzed results from the Fall 2017 YSS to compare awareness to previous YSS findings and to assess differences in awareness between Regular Force and Primary

Reserve CAF members.

Results: Results indicated that awareness of most programs available to the ill and injured have increased over time. Junior Non-Commissioned Members (Jr NCMs) and members with fewer years of service in the military were the least aware of programs. A comparison to 2017 results indicated that awareness of most ill and injured programs have increased; however, awareness among Jr NCMs and members with fewer years of service remain lower than other groups. Furthermore, results from the Fall 2017 YSS indicated that Primary Reservists had lower awareness of programs than Regular Force members.

Conclusion: Results suggest efforts to raise awareness may require targeted education of low-awareness members such as Jr NCMs, those with fewer years of service, and Primary Reservists.

4A01: Emergency Medicine in the Canadian Armed Forces: Is the evolution of a new clinical specialty inevitable?

Forestier, Colleen, MD[1]; Ott, Monica, MD[2]

[1]Canadian Armed Forces; [2]Department of National Defence

Brief Description: The field of Emergency Medicine has expanded significantly since the 1980s. Prior to this, clinicians with no specialized training provided first-line care in hospitals. Currently, in Canada, there are two EM medical education streams both supported by the Canadian Association of Emergency Physicians (CAEP); a five year Royal College fellowship stream known as FRCP and a 3-year stream through the College of Family Physicians of Canada, referred to as CCFP (EM). The area of EM in the CAF has not been designated as either a sub-occupation or a medical specialty, despite its evolution and importance in the delivery of front-line acute care.

In the CAF, the only EM education stream accepted in the Regular Force (Reg F) is the CCFP (EM) while the Reserve Force employs both CCFP (EM) and FRCPC physicians.

NATO doctrine now places more emphasis on advanced resuscitation techniques being delivered closer to the point of wounding, a capability known as Damage Control Resuscitation (DCR). This is of great importance to the EM world because DCR skills are unique and must be practiced and maintained.

Clinical Outcomes: To understand the implications of current employment model for EM in the CAF we sent out a survey to the 17 identified Reg F CCFP (EM)'s as well as the Res F practice leader, focusing on current employment models, and possible alternative models.

We reviewed data from CCFP (EM) graduates over the past 8 years and identified that only 27% are still active in EM practice, and that 53% have released from the CAF.

We evaluated the recent demand for EM capabilities during CAF deployments; the Fwd AE capability, MSRT and Role 2, as well as future SSE initiatives in our analysis.

A review of the employment of EM physicians in comparable sized militaries was undertaken to determine how other countries are managing this imbalance of supply and demand.

Patient Population: Initial results indicate that there needs to be a

change in the current CFHS structure to accommodate the evolving capabilities and employment requirements of EM physicians in the CAF.

We are currently preparing a working group to discuss sustainable options and will be able to provide these results by Oct 2018.

Conclusion: Once data has been discussed and considered, potential long-term sustainable solutions for employment models of EM physicians in the CAF can be demonstrated.

4A02: Utilization Profile of the Canadian-led Coalition Role 2 Medical Treatment Facility in Iraq: The growing requirement for multinational interoperability

*DaCambra, Mark, MD[1]; McAlister, Vivian, MD[1, 2]; Kao, Raymond, MD[1, 2]; Berger, Christopher, MD[1, 3]

[1]Canadian Armed Forces; [2]Western University; [3]Dalhousie University

Introduction: The Canadian Armed Forces (CAF) deployed a Role 2 (R2) Medical Treatment Facility (MTF) to Erbil, Iraq from November 2016 as part of Operation IMPACT, CAF's mission in support of the Global Coalition against Daesh in Iraq and Syria. The purpose of this study was to compare the utilization profile of this R2MTF with similar facilities previously deployed by Canada or by other nations in terms of level of multinational interoperability required.

Methodology: Retrospective data from 4 November 2016 to 3 October 2017 was reviewed from the electronic Disease and Injury Surveillance Report and the daily medical situation report. Clinical activity was stratified by Global Burden of Diseases category, ICD-10, mechanism of injury, services used, encounter type, nationality, and blood product usage. A review of the literature was performed to identify utilization profiles for other R2 and Role 3 (R3) MTFs over the last 20 years.

Results: A total of 1487 patients were assessed during that time (average of 4.1 visits/day). Of these 5.0% were Battle Injuries (BI) requiring damage control resuscitation (DCR) and/or damage control surgery (DCS), with a total of 55 casualties requiring medical evacuation after stabilization. Trauma non-battle injuries (TNBI) and disease non-battle injuries (DNBI) comprised 44% and 51% of patient encounters respectively. Other than dental conditions, musculoskeletal disorders accounted for the majority of presentations overall. A total of 57 units of fresh frozen plasma and 64 units of packed red blood cells were used, and the walking blood bank was activated 7 times. Although Canadian-led, the R2MTF was comprised of surgical teams from Canada, Germany, and Norway, nursing officers from the United States (US), and it was co-located with a US R1MTF. Mass casualty activations involved coordination of health care and logistical resources from over 12 countries. In addition to host nation military and civilian casualties, patients were treated with similar frequency from 15 different countries.

Conclusion: The Canadian R2MTF in Iraq has seen a diverse spectrum of casualties both clinically and in terms of patient nationality. Evacuation occurred through a non-Canadian system operated primarily by the US. Care was delivered by an international team. In all, 15 nationalities were represented. This experience demonstrates the importance of multinational interoperability and cooperation in effecting cohesive medical care in present and future coalition surgical facilities. Multinational interoperability derives from a unique relationship between higher medical command collaboration, international training, and adherence to common standards for equipment and clinical practice.

4A04: On a Systematic Approach to Physician Retention: A proposed Canadian Armed Forces medical officer retention framework

Strawson, Michael, MD

Department of National Defence

Brief Description: Highly trained, well equipped health services personnel are critical enablers to field an agile, flexible, diverse combat-ready military. Physicians and surgeons require several years of training at civilian institutions, resulting in a very long training cycle (6-9 years) between recruitment and first employment. This when combined with significant competition from the civilian job market, makes maintaining sufficient trained effective strength in these occupations quite challenging. Premature and excessive turnover of Medical Officer (MED) represents unnecessary degradation of core institutional knowledge, skills and capabilities to a level which could critically impair the ability to project health care where and when required. To date, there have been a variety of initiatives which aimed to improve organizational commitment and retention, however they have arisen outside of a systematic framework. This paper aims to review factors which lead to organizational commitment amongst physicians and through thematic analysis, organize them into a systematic framework. The proposed framework is presented and used to organize existing and planned programs and initiatives aimed at increasing organizational commitment and retention amongst MED.

Clinical Outcomes: The proposed framework will aid in the analysis of overall efforts within an organization to ensure fulsome and robust coverage of factors leading to organizational commitment and retention. The framework is successfully utilized when areas which affect organizational commitment but lack programming are easily identified. Outcomes from exploring these potential areas of vulnerability include developing ideas for new initiatives and programs. Downstream outcome measures could include assessment of individual and group organizational commitment along with trends in retention.

Patient Population: The ability to attract and retain sufficient numbers of personnel into the MED occupation and to retain enough experienced MED to allow for adequate leadership and progression within the Canadian Armed Forces (CAF) health system is fundamental to providing full spectrum, high quality care to Canada's fighting forces wherever they serve. Through improving organizational commitment and retention of MED, the proposed retention framework benefits the entire serving CAF.

Conclusion: A retention framework is presented which was developed from review of factors affecting organizational commitment. Using a systematic approach, the framework can be utilized to identify ideas for additional programming and initiatives and ensure robust coverage in all areas which affect retention of physician resources.

5B01: Microparticle and Interleukin (IL)-1β Production Associated with Human High Pressure Exposures

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Introduction: Biochemical pathways for production of microparticles (MPs), 0.1- 1 μm diameter vesicles, and IL-1β are linked. Further,

MPs increase in association with decompression from high pressure in simulated and *bona fide* underwater diving. It is unknown whether this response is due to exposure to high pressures or decompression. We hypothesized that MPs containing IL-1β are generated in humans while exposed to high gas pressures more so than as a response to decompression.

Methodology: After informed consent, Canadian Armed Forces Clearance Diver research subjects were exposed in hyperbaric chambers to 18 msw for 60 minutes following Canadian Forces Standard Air Decompression Tables. Blood samples were obtained 30 min prior to pressurization, at the conclusion of the pressure exposure and 2 hours post-decompression. Blood was processed for MPs analysis and assays of intra-MPs IL-1β following published techniques (Fr Rad Biol Med 106: 406, 2017).

Results: MPs elevations occurred while at pressure. MPs numbers/µl plasma in the 18msw group (n=15) were: pre-dive 2261 + 743, at pressure 4097 + 1002 (p=0.004, repeated measures [RM] ANOVA on ranks), post-dive 2554 + 803 (NS). Intra-MPs concentrations of IL-1β (n=6; pg/million MPs) were as follows: Pre-dive: 0.4 + 0.1; at 18 msw: 3.0 + 0.1 (p=0.001); post-18msw dive 1.8 + 0.1 (p=0.05).

Conclusion: Exposures to high gas pressures trigger production of MPs containing elevated concentrations of IL-1β. While these events may pose adverse health threats, their contribution to decompression sickness development requires further study. Investigations of mechanisms for these novel actions are underway.

5B02: Modifications to Standard Massive Transfusion Protocols in the Deployed Setting

*MacLean, Scott, MD; Funk, Chris, MD

Canadian Armed Forces

Brief Description: Damage control resuscitation and surgery (DCR and DCS) have formed the cornerstone of far forward support to deployed operations for Canadian Armed Forces (CAF) personnel in recent years. It is well known that early administration of blood products in trauma has significant impact on survival outcomes in these settings. In Canada, civilian trauma institutions employ protocols to facilitate transfusions in severely injured persons. Massive transfusion protocols (MTPs) simplify the administration of blood products and resuscitation adjuncts in this population. In resource constrained deployed settings, such as the CAF Role 2 and Mobile Surgical Resuscitation Teams (MSRT), modifications to MTPs are required.

Outcomes: The MTP was employed to administer early blood products, activate the walking blood bank, and integrate ROTEM in order to guide management for the resuscitative, operative and post-operative administration of blood products. During this casualty's treatment, 26 units packed red blood cells, 3 units FWB, 22 units plasma, 3 units platelets, 12g fibrinogen concentrate, and more than 6g tranexamic acid were administered. The casualty was stabilized for transport on post admission day 3 and survived to admission to host nation facility.

Patient Population: Canadian Armed Forces' Trauma Team Leaders deploying on Roto 0 to a Role 2 medical treatment facility (MTF) examined the civilian MTPs available in major trauma centers across Canada and modified them for use. These protocols were examined and adjusted in an iterative process for ongoing quality improvement, these included the use of fibrinogen concentrate and fresh whole blood (FWB) via walking blood banks (WBB) as well as available laboratory

analysis including rotational elastometry (ROTEM). Here we reviewed one case of a severely injured casualty where the MTP was utilized.

Conclusion: In the resource limited setting, a modified MTP has been developed and employed at a CAF Role 2 MTF. This protocol demonstrated ease of use, integration of available blood products, WBB, and laboratory testing to conserve resources and increase survival after massive hemorrhage. From this case we identified a number of critical lessons learned: 1) the absolute requirement for FWB and WBB in a platelet deficient deployment setting. 2) Guided by ROTEM, a significantly more than expected amount of fibrinogen and TXA were used throughout care. 3) Thawing of plasma was identified as a rate limiting step in a balanced massive transfusion. Further investigation should be directed at the use of freeze dried plasma by Canadian DCR teams in the future.

Poster Presentations

P101: A Clinical Pharmacist in Primary Care: An opportunity for collaborative care and application of their expanded scope within Canadian Forces Health Services Center (Atlantic)

*Bernier, Marilyn, BSc Pharm; *MacMullin, Janet, BSc Pharm; Calabrese, Adam, BSc Pharm*

Department of National Defence

Brief Description: Pharmacist roles have evolved to an expanded scope of practice including renewal of prescriptions, adapting medication, prescribing for minor ailments and ordering laboratory tests. Hypertension studies have demonstrated that comprehensive pharmacist care including patient education combined with prescribing offers health benefits and cost savings to Canadians.

The current workflow model in Canadian Forces Health Services (CFHS) dispensaries are not structured to accommodate appointments, documentation and follow-ups to support expanded scope activities. To overcome these challenges and optimize our resources, Canadian Forces Health Services Center (Atlantic) integrated a pharmacist into the Primary Care health team in March 2015 in anticipation of the rollout of expanded scope of practice. The pharmacist's primary role is to collaborate with clinicians to optimize patient pharmacotherapy including expanded scope services, medication management services and contribute more actively to chronic disease management. This is the only program of its kind within CFHS.

Patients are provided the opportunity to attend a thirty minute to one-hour appointment. The pharmacist assesses the patient and presents and/or implements specific recommendations based on the patient's medical needs. The interaction is then documented in the electronic medical record and forwarded to the patient's clinician.

The objective is to determine the extent to which the program is being utilized, describe the type of service provided and the level of recommendation acceptance by clinicians.

Clinical Outcomes: Data was retrospectively extracted from all patient encounters with the clinical pharmacist at CF H Svcs C (A) in May 2016 and October 2017. Number of patient encounters, average number of medications, medical conditions, referral source, purpose of visit as well as the average number of times meeting with the pharmacist were reviewed. The number of recommendations implemented and the number of prescriptions initiated by the pharmacist were also evaluated.

Patient Population: Canadian Armed Forces members between the ages of 18 to 60 years old who may benefit from expanded pharmacy services or chronic disease management.

Conclusion: The program analysis shows that the pharmacist within Primary Care is being utilized and there is a high level of recommendation acceptance by clinicians. Although the program was initially intended to implement the expanded scope of practice, chronic disease management represents a high percentage of reason for visits. The insights gained through this program analysis could be applied to select patients in other CFHS clinics and civilian populations, with similar clinical profiles and in other countries with similar demographics and resources.

P102: Le profil clinique et les paramètres d'entraînement d'un échantillon de militaires présentant des douleurs aux membres inférieurs lors de la course à pied : protocole de recherche

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[1]Centre interdisciplinaire de recherche en réadaptation et intégration sociale; [2]Université Laval; [3]Services de santé des Forces armées canadiennes; [4]Université Colombie-Britannique

Introduction: Les blessures musculosquelettiques (MSQ) sont très fréquentes au sein de la population militaire canadienne et un projet de surveillance des blessures effectué à Valcartier révèle que 58.6% des blessures sont liées au sport ou à l'entrainement, dont 38% étaient rapportées à la course à pied. Cette problématique est également répandue au sein des autres armées, et au sein de la population de coureurs en général, et il n'existe aucun consensus sur les facteurs de risque qui sont associés à l'apparition des blessures. Les objectifs de cette étude sont: 1) décrire le profil clinique d'un échantillon de militaires qui présentent des douleurs aux membres inférieurs (MIs) à la course à pied; 2) identifier les paramètres de l'entraînement à la course à pied en termes de volume, durée, fréquence et intensité, ainsi que la présence de changements récents; 3) explorer l'association entre la présence de changements récents au niveau des paramètres d'entrainment et le type de blessures MSQ.

Methodology: Cette étude descriptive, transversale, sera effectuée sur un échantillon de convenance de 136 militaires de Valcartier, homme ou femme, de tous âges, qui présentent de la douleur aux MIs lors de la course à pied. Un séance d'évaluation sera effectuée par une physiothérapeute pour documenter les informations socio-démographiques, les caractéristiques occupationnelles, le profil de course, l'histoire d'apparition des symptômes, les conditions de santé associées et les antécédents de blessures. Ensuite, des tests cliniques seront effectués pour identifier la nature des blessures.Les participants seront invités à remplir deux formulaires qui portent sur leurs perceptions en lien avec la réalisation des activités quotidiennes et du travail. le type de chaussure de course et les paramètres d'entrainement à la course seront évalués et documentés. Enfin, deux composantes de la cinématique de course seront évaluées sur un tapis roulant au moyen d'une caméra 2D: la cadence des pas et le contact du pied au sol. Des analyses statistiques descriptives (obj. 1et 2), ainsi que des test non paramétriques de Khi-carré (Obj.3) seront effectués.

Results: La collecte de données aura lieu de avril à octobre 2018. On s'attend:1) à ce qu'au moins 40% des blessures MSQ soient localisées au niveau du genou; 2) à ce qu'une majorité des militaires rapportent des changements récents au niveau des paramètres d'entrainement qui coincident avec l'apparition des symptômes.

Conclusion: Ce projet permettra une meilleure compréhension des douleurs à la course à pied chez les militaires et contribuera au développement d'un programme de prévention efficace.

P103: Primary Army Reservists' Satisfaction Accessing and Using Military and Civilian Health Services

Pickering, Donna, PhD

Department of National Defence

Introduction: Most military health research focuses on the experiences of Regular Force personnel. Fewer studies have assessed the health of Reservists, or sought to better understand the factors related to it. This research seeks to address this gap by examining Canadian Army Reservists' satisfaction with access to and care received when using military and civilian medical and mental health services, along with some factors related to these satisfaction ratings.

Methodology: Canadian Primary Army Reservists were invited via e-mail to participate in an online health and well-being survey (n = 1154) which included questions regarding satisfaction accessing and care received when using military and civilian medical and mental health services.

Results: Higher ratings of satisfaction accessing and care received using civilian mental health services corresponded with a positive change in perceived overall mental health from one year ago. A similar trend emerged in the military mental health context. Higher levels of satisfaction with access to military medical services corresponded with a positive change in perceived overall mental health from one year ago. Higher ratings of satisfaction accessing and using military medical and mental health services corresponded with a positive change in perceived overall physical health and level of stress from one year ago.

Higher levels of perceived social support were associated with increased satisfaction accessing and using military and civilian medical and mental health services, except for satisfaction using civilian medical health services. Feelings of belonging to one's local community were not only related to satisfaction with access and care received using civilian mental health services but to a few military-related services. A similar pattern of results extending beyond one domain to another was not found for feelings of belonging to the CAF/one's Reserve unit.

Civilian job and educational status were related to satisfaction accessing and using military medical and mental health services. Reservists attending college/university full-time were less satisfied with the care they received using military mental health services vs. those not attending college/university. Reservists with a part-time civilian job were less satisfied with the care they received using military medical services vs. those with no civilian job.

Conclusion: Factors uniquely related to Reservists' involvement in both military and civilian worlds play a role in their satisfaction accessing and using military and civilian health services.

P104: Initial Findings of the Clinical Screening of Special Operation Forces Soldiers for Mild Traumatic Brain Injury

*Cardinal, Deborah, MSc; Courchesne, Isabel, BSc; Riddell, Robert, MD; Vallee, Isabelle, MD

Department of National Defence

Brief Description: Traumatic brain injury is the most common injury in military during combat, with blasts/explosions as the primary cause. Any injury sustained to the brain can lead to immediate and long-term impairments. Various cervical dysfunctions can lead to widespread symptoms as noted in patients suffering from an acceleration-deceleration injury, which complicates the clinical picture.

Special Operation Forces (SOF) members are often exposed to repetitive low-level blasts, as seen with breaching and other relatively close-proximity explosives work. They also engage in other activities such as high caliber, long-range sniping. Snipers are exposed to significant upper quadrant stresses. Long term physical and cognitive impairments resulting from this chronic exposure are not well understood. Current research is minimal, however it does link repetitive low-level blast injury with mild traumatic brain injury (mTBI), and has demonstrated the development of long-term neurodegeneration. Many SOF members have complained of several symptoms similar to those of mTBI resulting in the implementation of our screening process.

This poster will highlight the initial findings after the implementation of a mild traumatic brain injury screening process within the Special Operation Forces Members.

Clinical Outcomes: Screening tests: Impact Test, Vestibular/Ocular Motor Screening (VOMS), BESS, Cervical Joint Position Error Test (JPET)

Several symptoms have been reported following exposure to either repeated blasts from explosive charges or repeated firing of long range rifles. Consistency of reported symptoms and objective findings are noted within each of these two groups. Although there is overlap regarding signs and symptoms between the groups, there are also consistent differences between breaching and sniping, indicative of two separate mechanisms of injury (blast and repetitive acceleration-deceleration). Also noted is the direct correlation between the amount of exposure and symptoms experienced.

Patient Population: Active CANSOFCOM military personnel

Conclusion: The above information highlights the importance and complexity surrounding mTBI sustained from low-level repetitive blasting/firing in CANSOFCOM and identifies the need for further studies and research for best practices regarding diagnosis, assessment, treatment, and recovery of such injuries for the care of these soldiers. The different mechanisms of injury would indicate the requirement for different approaches. Information collected at the clinical level must be shared with researchers from this field of interest. This will aide in the prevention of mTBI and repetitive stress injury in the CANSOFCOM population, and by extension, similar populations in CAF.

P105: A Snapshot of Injured Recruits at Canadian Forces Leadership and Recruit School

*Laroche, Marie-Andrée, Bcs; Dufour, Carole-Anne, MSc; Spivock, Michael, PhD; Lalonde, Francois, PhD; Guimond, Renaud, MSc

Department of National Defence

Brief Description: The Canadian Forces Leadership and Recruit School (CFLRS) is at the cornerstone of the CAF training system. Almost all military members will undergo their Basic Military Qualification or Basic Military Officer Qualification (BMQ) at CFLRS. Injured recruits leave the BMQ course and are transferred to a recovery platoon called Phase 1. Phase 1 allows injured trainees the ability to recover under medical supervision before attempting return to training. The 41st Health Services Center physiotherapy section treats and rehabilitates hundreds of injured recruits per year. The Personnel Support Section (PSP) is responsible for delivering most of the physical training and for administering the physical tests for recruits during BMQ. The PSP section also assists recruits post injury, as directed by medical services, by creating, administering and supervising specific and targeted exercise programs. This presentation's aim is to document trainee demographics in addition to the injury type and recovery time for injuries sustained during BMQ.

Clinical Outcomes: This is an epidemiology study on recruits' files. All participating recruits were joining the CAF between January 2014 and December 2017.

Data obtained: (1) Age and gender; (2) Injury type or medical condition; (3) Mechanism of injury (ex.: rucksack march); (4) FORCE test results; (5) Number of days spent on Phase 1; (6) BMQ completion status.

Patient Population: CAF recruits who sustained a musculoskeletal injury while on their BMQ, age 16 to 54

Conclusion: This poster will expose different characteristics of our current injured recruit population. For example, significantly more women are injured during their BMQ training. Although they account for an average 19% of all new recruits, they represent 40% of the Phase 1 platoon. With this knowledge, we hope to improve injured recruit care and possibly develop prevention strategies to minimize injuries.

P106: A Comparison of FORCE Test Results and Injuries at Canadian Forces Leadership and Recruit School

*Dufour, Carole-Anne, MSc; Laroche, Marie-Andrée; Spivock, Michael, PhD; Lalonde, Francois, PhD; Guimond, Renaud, BSc

Department of National Defence

Brief Description: The Canadian Forces Leadership and Recruit School (CFLRS) is a cornerstone of the CAF training system. Almost all military members will undergo their Basic Military Qualification or Basic Military Officer Qualification (BMQ) at CFLRS. Successful completion of the CAF physical fitness test, the FORCE test, is a requirement for the successful completion of BMQ.

At CFLRS, the FORCE evaluation is administered by PSP to all recruits during their first week of BMQ. That initial evaluation determines whether a candidate can continue within a BMQ platoon or, in case of failure, the candidate will be sent to Phase 2 to do supervised and progressive physical exercises until ready to reintegrate into a BMQ platoon.

Trends were observed amongst recruits who barely passed the initial FORCE evaluation. It appeared that recruits achieving a mediocre score on some components of the FORCE test were more likely to get injured and removed from BMQ training. When this occurred, injured recruits were sent to Phase 1 training to recover from their injury before attempting a return to their BMQ training. This poster will aim at presenting statistical links between FORCE test results and risk of injury.

Statistics compiled by PSP staff and the CFLRS will be presented. A wide range of data have been captured, including age, sex, location of injury, number of days spent on Phase 1 (injury platoon) and the outcome after recovery, namely successful completion of BMQ or not. FORCE test results were also compiled, namely time of completion for each component, self-rated perceived effort and self-declared injury while performing the test.

CAF recruits who sustained a musculoskeletal injury while on their BMQ.

Clinical Outcomes: Statistical analysis will be conducted with SPSS (Version 21, IBM, Chicago, IL) Demographic and other descriptive data will be presented with mean, standard deviation and percentage. Correlation of injury with gender, age and BMQ vs BMOQ.

Multivariate logistic regression models will be used to predict likelihood of different injuries (with factors such as age, gender and fitness level as independent predictors …)

Linear Regressions will be used to predict healing time based on injury type, fitness level, age and gender.

Patient Population: Currently under statistical analysis

Conclusion: By knowing the characteristics of our injured population, targeted physical injury prevention program can be developed and yield lower costs of training recruits, better retention and a healthier military population after BMQ completion.

P107: Assessing Human Fecal Contamination in a Mixed-use Watershed using Microbial Source Tracking

*Honey, Jonathan, DC[1]; Fisher, Andmorgan, PhD[2]; Gellasch, Christopher, PhD[3]; Sikaroodi, Masoumeh , PhD[4]; Real, Nicole, MSPH[5]; Brueggemeyer, Mary, MD[6]; Pajuluoma, Gordon, MSPH[1]

[1]Canadian Armed Forces; [2]U.S. Army Corps of Engineers; [3]Eastern Michigan University; [4]George Mason University; [5]United States Army; [6]Uniformed Services University of the Health Sciences

Introduction: Protecting surface waters from fecal pollution is critical to protecting public health. Human fecal contamination, in particular, poses a significant risk to human health because it contains an abundance of human pathogens. While routine monitoring of standard fecal indicator bacteria (FIB), such as E. coli, has significantly reduced public exposure to pathogens, standard FIB do not enable determination of the host-species from which the fecal matter originates. Identification of host-species enables water quality managers to implement the most efficient and effective mitigation strategies. Rock Creek, MD has, for many years, been designated as an "impaired" waterway due to fecal contamination.

Methodology: The primary objective of this study was to determine the current proportion of human-associated FIB in Rock Creek. To meet this objective, quantitative polymerase chain reaction (qPCR) was employed to determine the proportion of human Bacteroides present in Rock Creek. Water samples were collected and standard water quality parameters, including dissolved oxygen, total dissolved solids, turbidity, pH, temperature, and E. coli, were monitored over a ten-week period. Precipitation, hydrographic, and land-use data were collected to assess their impact on water quality parameters.

Results: Data analysis revealed the following: E. coli and water temperature exceeded regulatory standards; the mean proportion of human Bacteroides was 57% (CI: 40-74%, n=5); there was a moderate, positive correlation between rainfall and [E. coli] (r=0.545, p=0.011, n=21); there was a moderate, positive correlation between [E. coli] and human Bacteroides proportion (r=0.404, n=5, p=0.501); and there was no significant difference across land-use types and [E. coli] (p-0.142, n=20).

Conclusion: Rock Creek remains impaired due to elevated temperatures and standard FIB, with humans potentially being a significant contributor to the fecal load, although this conclusion must be regarded with extreme caution owing to numerous study limitations.

P108: The Effect of Conditions Experienced During Shipment of Water Samples on the Reported Analytical Results of Cyanide

Honey, Jonathan, DC; Johnston, Gary, MHSc; *Pajuluoma, Gordon, MSPH

Department of National Defence

Introduction: The need to accurately determine contaminant concentrations of groundwater and surface water sources is essential to properly evaluate human health risks. Analysis of these water supplies requires that samples must arrive at a laboratory within designated holding times and temperatures. Cyanide is an example of a contaminant where the concentration can diminish based on the storage conditions and may result in a non-detection (false negative) result. A false negative result can lead to underestimation of health risks for individuals that use this water. Sample storage conditions while in transit to the laboratory must be controlled to prevent this cyanide degradation. The EPA established standards for sample transportation can be exceeded during challenges experienced during military missions. Military missions are situations that dictate extended transportation times and non-ideal storage temperatures. The effect of these transportation conditions on the analytical results of cyanide is not known when conditions unique to the military logistical chain are taken into account.

Methodology: This study aimed to determine the amount of time that can pass before aqueous cyanide concentrations can no longer be accurately determined. The flow injection analysis (FIA) instrument was used to quantify cyanide in accordance with EPA method OIA 1677-09. Analysis of 160 samples over a three week period and hold time calculations were completed in accordance with current industry practice (ASTM D4841-88) which indicates that an exceedance occurs when the difference in percentage recovery compared to Day 0 exceeds 15%. Study conditions simulated a range from ideal to adverse storage and transport conditions. These adverse conditions represent those experienced when transporting water samples from overseas to a laboratory.

Eight total conditions were studied. Including the permutations of:

- $4^{\circ}C$ and $35^{\circ}C$
- pH preservation and no pH preservation
- Deionized water and groundwater

Results: Results indicate that, during the 21 days of this study, none of the studied variables adversely affected the analytical result. Evidence suggests that in instances of poor laboratory handling, false negative reporting of cyanide may occur. Specifically, circumstances with samples that are both exposed to ambient air prior to analysis and do not receive the mandated pH preservative have significantly lower recoveries.

Conclusion: These results indicate that there is no justification to modify any current practices performed for cyanide quantification. Findings demonstrate that ensuring that samples receive field pres-

ervation is essential for analytical accuracy. This study reveals that current practices accurately report the results of cyanide analysis.

P128: Enhancing Veteran Care: Alignment of Canadian Armed Forces and Veterans Affairs Canada drug benefit formularies

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Veterans Affairs Canada

Brief Description: Currently, there are two federal drug programs which are highly linked in their respective mandates. One is responsible for providing drug benefits to eligible members currently serving with the Canadian Armed Forces (CAF) and the other is responsible for providing drug benefits to eligible retired CAF members now with Veterans Affairs Canada (VAC). An alignment in key areas of their respective drug formularies would ensure a smooth transition of coverage of benefits and optimize appropriate accessible care. In accordance with evidence based medicine, this alignment process will ensure appropriate and affordable medications are included in the respective formularies. Medications for review have been divided into major drugs classes of significance to this population such as pain medications and mental health medications. Details in presentation show how these medications have been reviewed, data that has been generated and the actions, such as listing or delisting or changing adjudication criteria that have been taken after analyzing discrepancies between the respective formularies.

Clinical Outcomes: A comparative list of the drugs prioritized in the project scoping began with 3 major classes of medications: musculoskeletal or mechanical injury medication, pain medication and medications used in mental health. A review of whether the medication is listed on one or both formularies and whether the criteria for use was same or different. Drug utilization data was also reviewed. Analysis noted discrepancies and recommendations were brought forward to respective Drug Formulary Review Committees for their review. After careful review and analysis of 177 drugs/drug classes, the number of discordantly listed drugs was reduced from 32% to 20%. Findings have prompted listing changes that reduce the likelihood of treatment interruption among CAF personnel transferring to VAC.

Patient Population: Serving members; transitioning members; Veterans.

Conclusion: The number of discordantly listed medications between two federal drug programs was substantially reduced following a systematic comparison of the drug formularies. As a result, medication coverage of transitioning members is more consistent, high quality and accessible without difficulty or interruption.

PRIMARILY MENTAL HEALTH & WELL-BEING

Podium Presentations

1B01: Utilizing Pharmacogenetics to Enhance Personalized Psychiatric Care for Treatment-seeking Canadian Armed Forces Veterans

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[1]St. Joseph's Health Care, London; [2]Ryerson University; [3]DNALabs Canada, Inc.; [4]Department of National Defence; [5]Western University; [6]McMaster University

Introduction: Many Canadian Armed Forces (CAF) members and veterans with operational stress injuries will try a series of pharmacologic agents before finding the right one to meet their needs. This can result in lengthy and costly delays on the track to recovery. The MatchMy-Meds test is a pharmacogenetic test that gives healthcare providers an easy-to-read report containing clinically validated and actionable drug and dosing recommendations based on a patient's DNA, which is collected from a simple, non-invasive mouth swab. In theory, this test would facilitate improved psychotropic medication efficacy and effectiveness, and mitigate the onset and management of adverse drug reactions.

Methodology: Prior to embarking on a prospective examination of the effectiveness of pharmacogenetics among treatment-seeking military personnel and veterans, the research team believes it would be beneficial to evaluate the utility of personalized medicine retrospectively. As such, the current study aims to identify up to 20 patients of the Parkwood Institute Operational Stress Injury (OSI) Clinic that have failed on a number of psychotropic medications, and eventually, through trial-and-error, stabilized on the "right" psychotropic medication. These potential participants will be invited to provide a cheek swab, which will be compared to a chart review of participants' history of prescribed psychotropic medications and doses, dates of prescription, and dosage increases and titration.

Results: Results for the study will be presented in the following ways: 1. quantification of the cost of delay between initial psychiatric assessment and optimization of psychotropic medication; 2. quantification of the number of drugs/dosages tried before finding the right drug; and 3. evaluation of the length of time in treatment at the Parkwood OSI clinic, including both psychiatric and psychotherapeutic care, and assess whether the use of pharmacogenetics would have decreased the amount of time required to achieve stabilization.

Conclusion: The process to stabilize individuals on a psychotropic medication can be challenging and time-consuming. It is possible that routine administration of a simple pharmacogenetics test to treatment-seeking CAF members and veterans may save both time and money, and accelerate the path to recovery.

1B03: An Overview of Addiction Diagnoses in CAF Personnel using Electronic Health Records

Weeks, Murray, PhD; *Hawes, Robert, PhD (Cand)

Department of National Defence

Introduction: Addictive disorders such as alcohol use disorders (AUDs) represent a significant health problem worldwide, including for military organizations. These disorders can negatively impact operational readiness and productivity, are often accompanied by other mental health disorders, and are associated with significant healthcare costs. However, little is known regarding the overall burden of these disorders in the Canadian Armed Forces (CAF). This study used electronic health records to provide an overall description of diagnosed addictions in the CAF over a one-year period, including incidence and prevalence estimates, differences across demographic and military factors, and treatment-related outcomes.

Methodology: We examined data extracts of mental health notes

within the Canadian Forces Health Information System (CFHIS) wherein diagnoses of addictions and other mental health problems were recorded by clinicians. These extracts were also linked to the Master Patient Index (MPI) in order to calculate person time at risk for addiction diagnoses in the CAF Regular Force (RegF) from July 1 2016 to June 30 2017. Diagnoses were based on Diagnostic and Statistical Manual- 5th Edition (DSM-5) criteria.

Results: We estimated 6-month prevalence of diagnosed addictions to be about 0.6% of the CAF RegF, with AUDs representing 84% of diagnoses. Rates of new diagnoses were higher among those aged 30-49 (compared to younger and older personnel), males, non-commissioned members (compared to officers), and Navy personnel (compared to Army and Air Force). Comorbidities were common, with 15% of those with a diagnosed addiction having one or more other addiction diagnoses, and 82% having one or more other mental health diagnoses, during the study period.

Among diagnosed individuals who had been referred to a program and discharged during the study period, 62% were judged by clinicians to have shown some improvement. Treatment completion and the absence of comorbidities appeared to be associated with having an improved status at discharge. The most common treatments received were cognitive behaviour therapy and supportive counselling, and we found no differences among treatments in terms of patient status at discharge.

Conclusion: This study represents an initial examination of diagnosed addictions in the CAF, as well as the mental healthcare of those with addictions. Importantly, clinical diagnoses do not capture the full burden of addictive behaviours and related problems. Further research will examine additional addictions-related indicators, and will use other data sources such as pharmacy and health insurance (Blue Cross) extracts to assess the degree of prescription drug use and healthcare costs of long-term treatment programs.

1E05: Military Family Resilience/y: An environmental scan of programs and services

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Introduction: This paper reports the results of an environmental scan of programs and services that implicitly and explicitly address resilience/y in military families in Canada, the United States, the United Kingdom, and Australia. The goal of the environmental scan was to provide a snapshot of the current environment related to military family programming focused on resilience/y. This study is one component of a larger project focused on the development of a model of military family resilience/y through the analysis of the evolving conceptualization of resilience/y and how it applies to military families. The overall goal of this project is to develop a model of military family resilience/y that can inform ongoing program and policy development for military families. Resilience is defined as a dynamic process involving positive adaptation despite significant adversity or trauma (MacDermid, Samper, Schwarz, Nishida, & Nyaronga, 2008), while resiliency refers to outcomes resulting from the process(es) of resilience encompassing both individual assets and the social contexts in which they develop (Bowen & Martin, 2011).

Methodology: This environmental scan proceeded through a conditioned viewing process (Choo, 2001) involving the identification of the needs of an organization, the passive gathering of information about the external environment, analysis, and the conveying of the results within the organization (Albright, 2004). The scanning process was facilitated through a broad and comprehensive search strategy utilized to identify potential sources. A data extraction guide was created in Microsoft Excel to organize and analyze sources retrieved.

Results: Three hundred and twenty-seven programs and services focusing on resilience/y for military families were retrieved with most originating in the United States, followed by Canada, Australia, and the United Kingdom. The composite of resilience/y resources includes a combination of key national organizations in each country that offer direct supports to military families and/or refer them to civilian not-for-profit and government organizations that focus on serving the military community. Other organizations identified do not explicitly support military families but offer programming that included them or adapted to meet their specific needs. Program emphases clustered into categories, specifically, those that support psychological and/or social well-being, offer occupational support or employment readiness opportunities, enhance financial literacy and planning, and/or foster physical and spiritual wellness.

Conclusion: The results of this environmental scan provide key information about current international programs and services that will inform the development of a model of military family resilience/y.

2A01: The Evolution of Suicide Surveillance in the Canadian Armed Forces: From counting deaths to helping prevent them

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Department of National Defence

Brief Description: Monitoring suicide rates in the Canadian Armed Forces (CAF) has been one of the Canadian Armed Forces Health Services (CFHS) priorities since the mid-1990's. The period of Canada's involvement in the Afghanistan mission (2002-2012) saw an increase in both the absolute numbers as well as the age-adjusted rates of suicides amongst CAF Regular Force males. This was not an unexpected effect of active combat in a volatile war zone, but the increase was nonetheless of serious concern to CAF senior leadership.

Overall Regular Force male CAF suicide rates have not returned to pre-Afghanistan levels, but have remained fairly stable over the past few years, as has the identity of the high risk groups. With this rate stability, and the evolution of the science related to suicide, new questions beyond mortality rates are emerging: What underlying risks and protective factors do these rates reflect? How can we effectively respond to questions on suicide in the CAF given traditional surveillance data's limitations?

This presentation describes how the traditional suicide surveillance program within CAF has evolved to respond to these and other questions.

Clinical Outcomes: The surveillance system collects all reported suicide information for CAF members, but reports only on the Regular Force male **subset** for both privacy and statistical power reasons. These data primarily allow CAF to account for and monitor suicide trends over time, but are limited in their ability to describe CAF-specific suicide characteristics and how the military environment may interact/contribute to these characteristics.

To address this, the surveillance data has been increasingly supplemented with evidence garnered from other existing CAF sources, usually using research methods different from surveillance.

Patient Population: The suicide surveillance program within CAF has been supplemented using five 5 sources of complementary suicide information: a) Medical Professional Technical Suicide Reviews; b) survey data from the CAF Mental Health Survey, the Recruit Health Questionnaire, and the Health and Lifestyle Information Survey; c) electronic health record data; d) CF Cancer and Mortality Study II data; and e) methodological exercises that help epidemiologists better understand the data that are used to calculate rates.

Conclusion: This enhanced approach ensures a broader understanding of suicide trends and of the factors that may put CAF personnel at increased risk. This provides contextual information to better interpret CAF suicide rates. This also ensures that all prevention- and care-related decisions made by Senior Leadership and clinicians are evidence-based and reflect up-to-the minute CAF needs.

2A02: Preventing Suicide in Veterans: Highlights from the CAF-VAC Joint Suicide Prevention Strategy

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Brief Description: In October 2017, the Canadian Armed Forces and Veterans Affairs Canada announced a CAF-VAC Joint Suicide Prevention Strategy to provide a framework for a collaborative approach to suicide prevention across the two federal departments. This framework provides for a shared purpose, common guiding principles and mutual strategic lines of effort to guide both organizations in their continuing efforts at suicide prevention. At the same time, the Strategy accounts for the distinct legislative mandates of each department, as well as the unique needs of serving members and Veterans. It also places a special focus on the transition from military to civilian life, that can be a period of vulnerability for those leaving the military and starting their post-service life. This presentation will describe the principles and framework of the Joint Suicide Prevention Strategy (SPS), with a special focus on its relevance for the Veteran community. It will also provide an update on the suicide prevention activities that Veterans Affairs Canada has focused on in the past year.

Clinical Outcomes: Outcome measurement is based on the Action Plan items developed under the 7 Lines of Effort of the SPS, which are: communicating and educating; building and supporting resilient Members and Veterans; connecting and strengthening Members and Veterans through families and community; providing timely access to effective health care and support; promoting well-being through transition to civilian life; aligning protocols, policies, and processes to better manage risk and stress; continuously improve through research, analysis and lessons learned.

Patient Population: About 10,000 CAF members are released from military service in Canada each year, roughly half from the Regular Force and half from the Primary Reserve Force. As of December 2016, there were an estimated 670,100 CAF Veterans living in Canada. About 69,700 Veterans served in the Second World War and the Korean War, average age 91. About 600,400 served after the Korean War, average age 57. Just over 100,000 CAF Veterans are active clients of Veterans Affairs Canada.

Conclusion: Through a shared vision, common guiding principles and strategic objectives, with special focus on transition from military to civilian life, the Joint Suicide Prevention Strategy will work to foster an environment where military Members and Veterans live fulfilling lives, receive support and care when needed, and suicides are prevented. The Joint CAF-VAC Suicide Prevention Strategy establishes an ongoing commitment to suicide prevention to protect the people who have supported and protected Canada.

2A03: #HERE4U Military Edition: A work in progress

*Stuart, Heather, PhD; McDowell, Colleen; Edgecome, Kenneth, PhD; Aldridge, Don, MBA

International Business Machines (IBM)

Brief Description: The #HERE4U Military Edition will be an instant messaging smartphone chatbot that will connect adult military personnel, family members and veterans to a mental health counselling application that uses the IBM Watson cognitive analytics platform. Users will carry on a conversation. Watson will ask questions and refer the user to clinically vetted mental health resources as appropriate. If the user wishes to speak to a counsellor, or if Watson determines that this would be beneficial, they will be handed off to a live counsellor to continue with the conversation.

The first 2-year portion of the development is being conducted under the CIMVHR Advanced Analytics Initiative and funded through a multi-agency initiative. The goal of this 2-year phase is to collect a corpus of substantive material needed by Watson to (a) manage mental health conversations, including triage to a live counsellor, (b) 'train' Watson in the conversational language military personnel would use to describe mental health and emotional challenges, determine what features of a chatbot application would be helpful, and build the application. In a subsequent 5-year project, we will field test a working prototype.

Clinical Outcomes: We are not yet at the point of collecting outcome data (still in the development phase); however, we are interested in determining whether the #HERE4U application, when implemented, will improve access to treatment and resources, reduce psychological distress, and improve mental health of end-users. Conversations will take place in real time so we long wait lists will be reduced.

Patient Population: We are targeting military personnel, family members, and veterans as high-risk groups for mental and emotional problems because of their stressful living conditions which may include exposure to trauma, long separations, frequent moves, and difficult to make transitions to civilian life.

Conclusion: Immediate access to a text-based application may overcome barriers to treatment and reduce the burden of mental and emotional health problems on military families in Canada, with the potential to be generalizable elsewhere.

2A04: Occupation Specific Mental Resilience Training for Air Engineer Control/Operators (AEC/AEC Op)

*Chaudhry, Feroz, MA; Guest, Kimberly, MSW; Bailey, Suzanne, MSW

Department of National Defence

Brief Description: While the Road to Mental Readiness (R2MR) program has been gradually integrated throughout the career develop-

ment 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. In order to prepare CAF personnel to meet these unique demands, we have further expanded on our Attention Control module for our Aerospace Engineer Control/Operators (AEC/AEC Op) members. This presentation will highlight the unique attention control skills, and the use of gaming, in assisting the development of mental health skills and resilience for the unique operational demands of the AEC/AEC Op during their training and throughout their careers.

Clinical Outcomes: The R2MR for AEC/AEC Op provides members general mental health literacy as a part of the prepare, perform and recover cycle. Topics include definitions of mental health and various sources of stress and sources of support; the physiology of stress; the Big Four skills; Big Four Plus skills including Attention Control, Memory, and Motivation; monitoring mental health along the Mental Health Continuum Model; Recovery activities and when to seek help.

The unique teaching component of this material revolves around a newly developed attention control module. The operational demands required functioning for prolonged periods of time with exposure to screen time while maintaining a high vigilance without necessary stimulus, or repetitive stimulus, to requiring a rapid transition for handling multiple moving objects and coordinating efforts in a time sensitive manner. A part of the challenge for candidates in training was to identify other areas where the necessary skills were developed and to be able to transfer them to the AEC/AEC Op training environment. The National Air Traffic Controllers Society (NATS) of the United Kingdom uses mini-games to encourage candidates to apply by assisting them in identifying transferrable skills from gaming to the occupation. Similarly, principles used in gaming were employed to assist candidates to identify key skills and begin adapting them to operational demands by also utilizing the games developed by NATS alongside other established principles of attention shifting and focus.

Patient Population: The program has been developed for initial occupation training and instructor training. It is co-delivered at the Canadian Forces School of Aerospace Control Operators (CFSACO) by trained instructors of the occupation with an R2MR representative.

Conclusion: Implemented in fall 2017, the program has been well accepted by the target audience and initial outcomes are encouraging.

2C01: The Shaping Purpose Military to Civilian Life Transition Study and Program Evaluation

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University of British Columbia

Introduction: An emerging consensus among international experts suggests that the "peri-release" period of military to civilian life transition (from 6 months prior to approximately 2 years after release from the military) may be of particular importance to long-term transition "success" (Thompson & Lockhart, 2015). There is, however, little research concerning the needs of releasing military personnel during this critical period, or of programs that offer services within the peri-release period (Shields et al., 2016).

The Shaping Purpose program is an established, 4-day, personal and career development course that has been adapted by former military members, to assist personnel in the peri-release period of military to civilian transition (MCT). This study is a qualitative evaluation of the chal-

lenges of MCT and the impacts of the program on military participants.

Methodology: The overall study design is based on the Context-Input-Process-Product (CIPP) evaluation model (Stufflebeam, 2007). This approach asks whether program objectives and methods were aligned with the needs of the population, and if those objectives were met.

Pre-program interviews were conducted with 60 military participants in order to understand, in their own words, their transition challenges and goals in attending. Interviews were also conducted with 13 case managers from CAF medical services, the IPSC's, VAC, and the Manulife SISIP program. Forty post-program interviews were conducted with participants to assess program impacts. A purposive sampling of thirty participants were interviewed again at 6 months in order to further understand their transition trajectories and to gauge durability of program impacts. Thematic and Narrative analyses were completed on a total of 160 hours of interview to complete the study.

Results: Interview generated themes will be presented, supported by direct quotations from interviewees.

Context: Interviews revealed a complex matrix of supporting and complicating factors in the pre and post release context.

Inputs: Course objectives were aligned with the goals of participants entering the course. Curriculum material was based on the available evidence and organized logically.

Process: Delivery of the course was appropriately modified in response to early feedback from participants to account for military cultural differences and functional limitations of medically releasing personnel.

Product: Post-program interviews suggest that the Shaping Purpose program is relevant and impactful addition to the suite of supportive services for members during the peri-release period of transition.

Conclusion: Implications of the evaluation findings are discussed with respect to supporting military personnel in MCT, improving transition trajectories, future Shaping Purpose programming, and CAF and VAC policy around MCT.

2E02: Strategies to enhance resilience in military families: Lessons learned from the FOCUS program

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University of California Los Angeles

Brief Description: This presentation describes lessons learned from Families OverComing Under Stress (FOCUS), a family-level resilience-building program designed for military and veteran families. As a prevention program, FOCUS teaches skills across the entire family to facilitate cohesion and increase mutual support. Skills such as communication, emotional regulation, problem solving, goal setting, and managing traumatic/stress reminders are taught in a manner that supports shared understanding and perspective taking through the development of a family narrative.

Clinical Outcomes: As a result of participating in FOCUS, families endorse improvements in their family's closeness, communication and problem solving skills and report high satisfaction with the program. Clinical outcomes include significant improvement on adult mental health symptoms (depression, anxiety, PTSD), child mental health functioning, child coping skills, and family assessment measures.

Patient Population: FOCUS serves military and veteran families through a suite of services that are designed to preventively meet the needs of families in a variety of formats and tiers of service: Community briefings, workshops, skill-building groups, and family sessions. Specific adaptations support couples, parents who want to participate without their children, families with young children, and families with a recovering warrior parent. Innovative formats for reaching families and reinforcing skills include telehealth delivery (TeleFOCUS), mobile applications (FOCUS on the Go), and online resilience training (FocusWorld.org).

Conclusion: FOCUS has been implemented in the United States for over 10 years. Lessons learned relate to strategies for successful implementation, understanding the role of adoption in new systems of care and adaptation for different family contexts and local culture. Valuable insight from the use of FOCUS for military and veteran families have also informed translation of FOCUS for use in other systems of care such as healthcare, child welfare and school systems. Participants will leave this presentation with tools and activities that they can apply in their local context.

3B01: Qualitative Investigation of Moral Injury – Perspectives from Canadian mental health care providers (1 of 4)

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[1]Parkwood Institute Operational Stress Injury Clinic; [2]Massachusetts Veterans Epidemiology Research and Information Center (MAVERIC); [3]Western University; [4]McMaster University; [5]Boston University

Introduction: Moral injury is often conceptualized as psychological distress caused by perceived transgressions of one's own moral code. The traumatic nature of military deployment has been well documented, however, less is known about the impact of military deployment on moral injury. The aim of the current study is to provide an updated look at clinicians' perspectives of moral injury based on their clinical work with members and veterans of the Canadian Armed Forces (CAF).

Methodology: In 2017, a qualitative survey was administered to clinicians employed at the Parkwood Institute Operational Stress Injury (OSI) Clinic. In 2018, the survey will be administered to mental health care providers working at any OSI Clinic across Canada, as well as community-based mental health providers who work with CAF members and veterans. The survey invites clinicians to document their experiences working with treatment-seeking service members and veterans using open-ended questions focusing on morally injurious events committed by a service member/veteran ("self" questions; e.g., treated the helpless with disrespect), or in the presence of a service member/veteran ("other" questions; e.g. witnessed another person treat the helpless with disrespect). This study aims to: 1) identify types and frequencies of morally injurious events present among treatment-seeking veterans and service members; 2) gain deeper insight into the construct of moral injury; and 3) identify the strategies mental health providers currently use to address moral injury in therapy. This study is part of a larger study that is employing a bottom-up approach in order to generate content for a future moral injury outcome measure.

Results: Results of the 2017 Parkwood OSI Clinic survey found that most clinicians reported working with CAF members and veterans who saw an immoral act(s) and did nothing to stop it, witnessed another individual treat the helpless with disrespect, and experienced another individual make a decision that resulted in the harm of themselves or others. Clinicians also reported that CAF members and veter-

ans typically found these events particularly distressing, and changed how they defined themselves and their identity. An updated look at the results of the expanded study is forthcoming.

Conclusion: Results obtained from the present investigation will provide important insight towards our theoretical understanding of moral injury, and ultimately help guide the construction of a reliable and valid measurement tool.

3B02: A Scoping Review of Treatment Modalities for Moral Injury (2 of 4)

St. Cyr, Kate, MSc[1]; Roth, Maya, PhD[1, 2]; McIntyre-Smith, Alexandra, PhD[1]

[1]Parkwood Institute Operational Stress Injury Clinic; [2]Ryerson University

Introduction: Moral injury is often conceptualized as psychological distress caused by perceived transgressions of one's own moral code. These transgressions may occur in the form of a military-related traumatic event (e.g., witnessing an immoral act and being unable to stop it due to rules of engagement). While evidence-based treatments and clear guidelines exist for the psychotherapeutic and psychiatric management of posttraumatic stress disorder (PTSD) stemming from exposure to military-related traumatic events, no similar treatment modalities or guidelines appear to exist for the treatment of moral injury as a result of military-related traumatic events.

Methodology: A scoping review will be conducted according to Arksey and O'Malley's established scoping review protocol. This protocol consists of: 1) identifying the research question; 2) identifying literature relevant to the research question used a clear search strategy; 3) selecting studies to include in the review; 4) charting the data; 5) collating and summarizing the data reported in the included studies; and 6) consulting and translating knowledge. Terms used in the search for relevant literature include "moral injury", "moral distress", "moral transgression", "morally injurious", "treatment", "intervention", and "psychotherapy". Databases searched will include Medline (PubMed) and PsycInfo; secondary searches of the literature (e.g., references of studies identified for inclusion in this study) will also be conducted.

Results: This study is currently in phase 2 of the protocol (identifying relevant literature). As data collection is in its early stages, no results are ready to be reported at this point in time.

Conclusion: The topic of better understanding moral injury amongst Canadian Armed Forces members and veterans as a result of their service is gaining momentum, both clinically and in terms of research. In order to formulate guidelines about effective psychotherapeutic treatment modalities for moral injury, a richer knowledge of the existing research base and its limitations is needed. This scoping review aims to provide some preliminary data in hopes of highlighting the strengths and weaknesses of existing research on this topic, and to provide direction for future research.

3B03: Addressing Deployment-related Moral Injury with Prolonged Exposure Therapy for Post-traumatic Stress Disorder: A case review of a Canadian veteran of the war in Afghanistan (3 of 4)

Roth, Maya, PhD[1, 2]; St. Cyr, Kate, MSc[1]

[1]St. Joseph's Health Care, London; [2]Ryerson University

Introduction: Prolonged Exposure Therapy (PE) for posttraumatic

stress disorder (PTSD) has been established as a first-line intervention for civilian and military-related PTSD. Its efficacy and effectiveness are well documented. Moral injury has been defined as perpetrating an act within the context of war that violates one's moral code and values. Emerging clinical opinion suggests that trauma-focused therapies, including PE, may not adequately address deployment-related moral injury, which is becoming more evident among veterans of the wars in Afghanistan and Iraq.

Methodology: A clinical case will be utilized to demonstrate the use of PE to address both PTSD symptom severity and moral injury in a Canadian veteran of the war in Afghanistan. The PE treatment protocol and augmentation to address moral injury will be outlined in detail. Treatment effectiveness will be measures by a comparison of pre, post and six-month follow-up self-report measures including the PTSD Checklist-5 (PCL-5), and the Outcome Questionnaire -45 (OQ-45), which are routinely completed by patients at the start of each treatment session at the Parkwood Operational Stress Injury (OSI) Clinic.

Results: Analysis is currently being completed. The results will provide descriptive statistical analysis of pre, post and six-month follow up data of the PCL-5 and OQ-45 self-report measures. Qualitative data will also be provided that highlight the Canadian veteran's description of the impact of PE in addressing his PTSD symptoms and moral injury.

Conclusion: The wars in Afghanistan and Iraq have been identified as highly morally injurious by a number of experts in the field, who also assert that trauma-focused therapies may not adequately address moral injury. This case review provides a single example of successful treatment of both PTSD symptoms and moral injury in a Canadian veteran of the war in Afghanistan. This has important clinical and research implications.

3B05: Mental Health Service use in Canadian Armed Forces Members at Risk for Moral Injury

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[1]Department of National Defence; [2]McMaster University; [3]McGill University

Introduction: Individuals exposed to morally injurious experiences (MIE) (i.e., events that transgress subjective moral standards) commonly report psychologically distressing moral emotions such as shame and guilt. Due to the inward and withdrawing nature of shame (fear of social rejection, judgment, and punishment), military leaders and clinicians have feared that those exposed to MIEs may be less likely to seek treatment for psychological distress; however, to date, treatment-seeking patterns of CAF personnel at risk of moral injury have not been explored. The objective of this study is to investigate mental health service use (MHSU) in deployed CAF personnel at risk for moral injury.

Methodology: The 2013 Canadian Forces Mental Health Survey data on previously deployed personnel were analysed. The impact of exposure to three potentially morally injurious experiences (PMIEs) (i.e., seeing ill or injured women or children who you were unable to help, ever feeling responsible for the death of Canadian or ally personnel, or having difficulty distinguishing between combatants and non-combatant) was explored in relation to past-year MHSU. MHSU was examined across different providers (i.e., professionals, para-professionals, family and friends). A series of logistic regressions were conducted, controlling for exposure to other deployment and non-deployment-related psychological trauma, psychiatric variables, military factors, and sociodemographic variables.

Results: Deployed members who were exposed to PMIEs during their deployment were more likely to seek mental health help from their family doctor/general practitioner (OR=1.58; 95%CI=1.13-2.20) and non-professionals (e.g., para-professionals and family/friends) (OR=1.26; 95%CI=1.01-2.55) in comparison to members not exposed to PMIEs. Pattern of results was driven primarily by those endorsing exposure to "ill or injured women or children who they were unable to help".

Conclusion: Contrary to long-held, but untested, assumptions regarding the impact of MIE on help-seeking, we found those exposed to PMIEs are more likely to seek out mental health support from gatekeeper professionals (i.e., general practitioners) and non-professionals rather than specialized mental health professionals (e.g., psychologists or social workers). Possible explanations for these findings will be discussed.

3C02: Supporting Veterans' Engagement in Personally Meaningful Activity Later in the Course of Treatment for an Operational Stress Injury: Experiences and outcomes from the MySELF group

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[1]St. Joseph's Health Care London; [2]Western University

Brief Description: For many veterans receiving treatment for an Operational Stress Injury (OSI), the step-down from acute treatment and transition to increased community involvement is challenging. The MySELF group is a recreation-based program designed to support this process. MySELF is an acronym which captures the focus on socializing, creative expression, leisure activities, and food in the intervention.

The MySELF group meets weekly for 12 weeks (3-hours/session) and has thus far been offered in the spring of 2016, 2017, and 2018. It is facilitated by a multidisciplinary team of art instructors, music and recreation therapists; a nurse, dietitian, psychologist and external consultants. Participants meet for coffee and discussion, participate in recreation activities (e.g., multiple art media, guitar, hiking, yoga, golf), and then share a cooked meal. Participants also engage in discussions and take-away exercises designed to enhance their motivation to engage in personally meaningful activities, knowledge of community resources, and ability to overcome barriers to recreation.

Clinical Outcomes: Clinical outcomes are measured during sessions 1, 12, and 4-months post completion, and include standardized self-report measures of Posttraumatic Stress Disorder (PTSD); depression and anxiety symptoms; quality of life; attitudes, beliefs, and behaviour relating to recreation; as well as a questionnaire soliciting group feedback. Each offering 16-18 clients enrolled, and 2-3 dropped out, typically citing anxiety or logistical issues. Analyses from 2016 and 2017 sessions reveal statistically and clinically-significant improvements between session 1 and 12 for depression and anxiety symptoms, quality of life, and attitudes, beliefs, and behaviour in relation to recreation. Declines in reported PTSD symptoms approached statistical significance. These gains were largely maintained after 4 months. Clients indicated they would recommend the group to other OSI clients (95%), and believed it offered benefits not provided by the rest of their OSI treatment (91%).

Patient Population: Participants were clients of the OSI Clinic at

Parkwood Institute in London, which assesses and treats veterans, Canadian Armed Forces members, and members of the Royal Canadian Mounted Police. To participate in the MySELF group, the client and their primary clinician must feel they can manage an unstructured group experience, and the client must indicate they are interested in improving their level of recreation. Most participants have PTSD and/or a mood disorder diagnosis and have been in specialized OSI treatment for multiple years.

Conclusion: There is merit to including group-based programming focused on enhancing engagement in personally-meaningful activity during the later phases of specialized treatment for OSIs.

3C03: Cognitive Behaviour Therapy with Mindfulness Classes for Active and Retired Military and RCMP with Operational Stress Injuries

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[1]University of Manitoba; [2]Deer Lodge Center

Introduction: There is a need for accessible mental health interventions that effectively support individuals experiencing mental health conditions in the military and RCMP population. The Operational Stress Injury Clinic in Winnipeg, MB offers a 4-session Cognitive-Behavioural Therapy with Mindfulness (CBTm) Course for referred individuals, immediately following diagnosis and during a time when they are awaiting more specialized treatment.. This manualized, low-intensity intervention provides an introduction to CBT by teaching basic principles and strategies for symptom reduction including cognitive restructuring, therapeutic exposure, effective goal-setting and mindfulness. Each class occurs one week apart Family members welcome to attend. The Winnipeg OSI clinic has offered 15 sets of classes since May 2015, reaching 118 participants to date.

Methodology: A retrospective chart review was conducted to determine client satisfaction with course material, impact of attendance on symptoms of anxiety and depression, retention rates for class attendance and participation rates for subsequent treatment, group therapy in particular. Clients who were diagnosed with a service-related mental health condition ($n = 67$) and attended the CBTm Course between 2015 - 2016 were included in the study. Outcomes included (1) perceived usefulness and willingness to attend again as recorded on the Education Session Evaluation; (2) symptom change as measured by DSM5 Cross-Cutting Symptom Measure-Adult, Patient Health Questionnaire-9 (for depression), and Generalized Anxiety Disorder 7-Item Scale; (3) proportion of clients completing some or all of the classes; and (4) proportion of clients completing subsequent treatment (i.e., psychiatric care, individual, couple and group therapies).

Results: At the time of writing this abstract, the research team is in the process of completing the data entry and analysis phase of the study. Final results will be presented at the MVHR Forum 2018.

Conclusion: The findings from this study will inform clinicians and therapists about the acceptability and efficacy of using a low-intensity psychotherapy intervention, CBTm, to target symptoms of anxiety and depression experienced by military and RCMP personnel with operational stress injuries and enhance uptake of specialized therapies.

3E01: Canadian Military Families

Manser, Lynda, MMgt

Department of National Defence

Introduction: In 2017 Canada released the new Defence Policy, STRONG SECURE ENGAGED (SSE). Canadian Forces Morale and Welfare Services was tasked with the implementation of SSE Initiative 24 – Develop a Comprehensive Military Family Plan (CMFP). Through the CMFP, improvements to the systems of care and support for families are being researched, identified, implemented, measured and sustained. The result will be a stabilized family life for Canadian Armed Forces (CAF) members who constantly face the unique demands and conditions of a military lifestyle.

Methodology: Over the past ten years there has been a growing body of research on the realities of Canadian military families that provide a solid base of evidence from which the CMFP is being developed. Internal systemic reviews and program audits, defence-wide studies and external research have all contributed to an increased understanding of the experiences and the needs of Canadian military families. These studies and over 200 reports were reviewed to compile detailed information on the scope of the issues, the scale of the number of families affected by those issues, and potential recommendations and strategies to improve their experiences. In addition, data was collected using the CAF Human Resources Management System on the demographics of CAF personnel and their families.

Results: As a result of this research review and demographic data collection, we now have a comprehensive picture of the state of Canadian military families. We know who are they, how many there are, spousal profiles, where they live (by province and by base/wing), what their composition is, their age ranges (by CAF member and by dependents). We have a better understanding of different family segment personas (e.g. single members / family of origin, couples without children, new family / young children, mature family / adolescents, empty nesters, veterans). We understand families with higher needs (e.g. families in breakdown, single parents, dual serving couples, special needs dependents, those caring for injured members or responsible for elder care). We know the military challenges they face (e.g. the military journey transitional challenges, geographical relocations due to postings, absences from family due to optempo, op-related illness, injury and death). And we know how military families are doing in general (e.g. the family journey transitional challenges, mental health & well-being, financial, intimate partner relationship challenges).

Conclusion: Families are changing and so are their needs. Through the CMFP research, we now have a clear understanding of the current state of Canadian military families.

3E06: The Posting Relocation Experiences of Military Families

Manser, Lynda, MMgt

Department of National Defence

Introduction: Military Family Services and Canadian Forces Morale and Welfare Services conducted a research study in 2018, "*Understanding the Needs and Processes of Canadian Armed Forces Families During Relocations*", to inform the development of the National Defence Policy Initiative "Comprehensive Military Family Plan". The objective of this research was to understand the needs of Canadian Armed Forces

(CAF) members and their families during the planning process of geographic relocation in response to postings, in particular with respect to unique stressors, transition needs, resilience and need/access/use of support resources.

Methodology: An online survey was developed based on an initial review of existing literature on relocation experiences. This survey focused on understanding the demographics of respondents, how many moves they've experienced and to which locations, the financial impact of those moves, the impacts on their dependents, how they made decisions with respect to where to live, what tasks were most important and which were most time-consuming during the relocation process, where they sought resources and support to assist them during their moves, any unique challenges associated with Imposed Restriction and Compassionate Postings, non-military spousal employment considerations, and any effects from the relocation process on the intimate partner relationship. To better understand these issues, eligibility was limited to CAF RegF members and/or their spouses who geographically relocated within the past 5 years due to a military posting.

Results: Over the course of one month, over 600 surveys were completed by RegF members (approx. 30% and an additional 10% dual serving couples) and civilian spouses of RegF members (60%). The average respondent was female (73%) between the ages of 25-44 (77%). Over the course of the military career, respondents have geographically relocated due to a posting anywhere from 0 times to 10+ times, with the highest percentage having relocated 4-6 times.

Respondents described their experiences on a variety of issues related to posting-related relocations including financial impacts, dependents, child care, housing, non-military spousal employment, relocation process tasks, supports and resources, house hunting trips, impacts on intimate partner relationships, Imposed Restrictions and Compassionate Postings. Analysis is revealing the emergence of several common themes.

Conclusion: Many military families experience geographic relocations due to military posting instructions. Through the voices of over 600 RegF members and spouses, this process is now better understood, particularly with respect to priority logistical requirements – those aspects that need to be better supported to ease the transitional challenges associated with relocations.

4B01: 2018 Canadian Armed Forces Members and Veterans Mental Health Survey

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Introduction: Combat and peacekeeping-related PTSD is an import-

ant public health issue in active Canadian military and veterans. In 2002, Statistics Canada and the Canadian Forces conducted the first nationally-representative mental health survey.

Methodology: In collaboration with Canadian Armed Forces, Veterans Affairs Canada, True Patriot Love, and several Universities across Canada, Statistics Canada is conducting 16-year follow-up of Regular Forces Personnel to examine longitudinal exposure to stress and subsequent health outcomes. In 2002, 5155 active military personnel participated in the Statistics Canada Survey. Between January and May 2018, follow-up interviews are being conducted.

Results: As of April 2018, 2100 people have been interviewed in the follow-up survey (Approximately 40% of the sample). The presentation will provide a summary of the design of the follow-up interviews, the attrition, and the key objectives of the survey.

Conclusion: This National Survey will provide much needed information about the longitudinal course of mental health problems, addictions, and suicidal behavior among military and veterans. We will examine the specific impact of deployment stressors on new onset and persistence of mental health problems.

4B02: PTSD and Associated Risk factors in Mental Health Treatment-seeking Canadian Armed Forces Veterans

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Introduction: Previous research has identified a number of pre-, peri-, and posttraumatic risk factors for the development of posttraumatic stress disorder (PTSD) amongst military personnel with exposure to peacekeeping and/or combat. The current study aims to identify these risk factors amongst a cohort of mental health treatment-seeking Canadian Armed Forces (CAF) members and veterans.

Methodology: This study takes place in two phases. The first relies on self-report questionnaire data in the forms of the PTSD Checklist (PCL), a survey of childhood experiences, and a survey of deployment experiences. Analyses will be conducted to determine which deployment-related experiences hold the greatest influence over PTSD symptom severity. The second phase will use unstructured clinical data in the form of initial psychological or psychiatric assessment reports, and will use natural language processing software (NLP) to identify and extract features related to pre-, peri-, and posttraumatic risk factors.

Results: This presentation will use data from the first phase of the study. Preliminary analyses (N=508) show that most participants are veterans (90.2%) with an average age of 44.5. Most participants (73.9%) met criteria for probable PTSD (average PCL score 45.2±19.3). Using the deployment experiences questionnaire, participants endorsed an average of 8.1 potentially traumatic events on deployment with the most common being "knowing someone seriously injured or killed (65.5%) and "seeing dead bodies or human remains (58.7%). Participants endorsed 2.0 potentially traumatic events during childhood on the childhood experiences questionnaire. Methodology and preliminary results will also be shared for the second phase of the study.

Conclusion: This study will determine whether variables such as a positive history of childhood and deployment experiences are risk factors

for the development of PTSD; and whether certain types of exposure (e.g., experiencing physical abuse as a child; witnessing crimes against humanity; killing in combat; etc.) increase risk of developing PTSD above and beyond experiencing any childhood or deployment-related trauma. Identification of key factors may accelerate the assessment and treatment process for individuals with positive exposure to one or more identified factor.

4B03: Developing an Internet Delivered Cognitive-behavioural Treatment for Traumatic Stress-related Injuries

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Brief Description: Traumatic stress-related disorders, including PTSD, are common problems for military personnel and veterans. There are effective treatments for these problems, with the most evidence supporting trauma-focused cognitive-behavioral treatments (CBT). However, many military personnel and veterans avoid therapy or drop out prematurely due to barriers that include geography, scheduling, and the prospect of talking about their trauma experience with others.

The results of over 50 randomly controlled trials of internet-delivered CBT for mood and anxiety disorders have demonstrated that treatment delivered in this way can be as effective as traditional face-to-face treatment if it contains a number of specific features, including modular protocol-driven treatment and therapist guidance and support. There is also considerable evidence regarding who is most likely to benefit from treatment delivered in this way.

There has been some research conducted on internet-delivered treatment for PTSD and this presentation will describe the piloting of an innovative therapist-assisted, internet-delivered cognitive therapy for PTSD (BEACON). Clients initially complete a rigorous online self-report assessment before being assigned to a care path. After assessment, clients deemed appropriate can receive treatment completely online with the support of a therapist. Clients complete outcome measures, psychoeducational readings, and homework that are part of an evidence-based CBT treatment protocol.

Clinical Outcomes: Clinical outcomes, therapeutic alliance, and satisfaction are measured at the start of treatment, weekly during active treatment, and at 3- and 6-months post-treatment. Outcome measures include the CORE-10, PHQ-9, GAD-7, and PCL-5.

Patient Population: People suffering from traumatic-stress related disorders, including military service members, veterans, and first responders.

Conclusion: It seems likely that internet-delivered treatments, including BEACON, will prove to be effective for PTSD for military personnel and veterans. These treatments will reduce barriers to access to effective evidence-based care for military personnel and veterans that include stigma, geography, system capacity, scheduling, outcome measurement, and therapist protocol adherence.

Future research will focus on the relative efficacy of internet-delivered treatments that focus on cognitive versus exposure interventions, matching treatment to client presentations, and the level of therapist support required to achieve outcomes comparable to face-to-face treatment.

4B05: Are Personnel with a Past History of Mental Disorders Disproportionately Vulnerable to the Effects of Occupational Trauma? A cross-sectional study of Canadian military personnel

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Introduction: Deployed military personnel are at significant risk of exposure to psychological trauma. Antecedent mental health disorders may play an important role on the relationship between continued exposure to psychological trauma and subsequent mental health problems. The objective of this study was to explore the marginal effects of pre-trauma mental health disorders with deployment-related trauma exposure with respect to post-deployment disorders.

Methodology: The data source was the 2013 Canadian Forces Mental Health Survey (CFMHS), of which 4,860 respondents had deployed in support of the mission in Afghanistan. The primary outcomes were past-year depression and PTSD. Multivariate logistic regression was performed for each outcome variable, looking for main effects of pre-trauma depression and/or PTSD and deployment-related traumatic events, as well as their interactions. Predicted probabilities as a function of pre-trauma mental disorder status and deployment-related trauma exposure were calculated and estimates of the marginal effects generated.

Results: Pre-trauma depression and PTSD both interacted with deployment-related trauma with respect to their corresponding past-year disorder. In addition, pre-trauma depression and pre-trauma PTSD interacted with each other, though only for the outcome of past-year PTSD. For past-year depression, deployment-related trauma had an effect only in those without a pre-trauma history of depression. The difference in marginal effects was small relative to the main effect of a pre-trauma history of mental disorder, with the adjusted predicted probability of past-year depression being ten times greater in those with previous depression relative to those without such a history at the median level of trauma exposure. For past-year PTSD, only those *without* pre-trauma PTSD and *with* pre-trauma depression were found to have a statistically significant, two-fold greater marginal effect of trauma relative to those without either pre-trauma disorder. There was no significant difference in the marginal effect of trauma with respect to past-year PTSD in those with and without a pre-trauma history of PTSD.

Conclusion: Our findings provide some reassurance with respect to the incremental vulnerability of personnel with past mental health problems to the effects of deployment-related psychological trauma. While both past disorders and trauma contribute to the risk of later mental health problems, their vulnerability to the effects of trauma on depression and PTSD were largely similar, with the notable exception that those *without* pre-trauma PTSD and *with* pre-trauma depression were twice as vulnerable to trauma with respect to later PTSD, relative to those without any previous disorder.

4E04: NATO HFM-258 Impact of Military Life on Children from Military Families: A review of family programs (4 of 5)

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Introduction: Over the last fifteen years, researchers have increasingly focused attention on developing programs to better meet the needs of children in military families by examining both risk and protective factors of child well-being. Recommendations center on the need to study the effectiveness of programs for use with military populations and to ensure that existing programs are adapted to take into account the circumstances that are considered specific for military families. Many researchers also suggest utilizing a family approach to treatment as parents may be more likely to seek support for their children than for themselves. There are a few evidence-based programs developed specifically for military families with children that target improved family communication, strengthening parent-child relationships and parenting.

Methodology: NATO Task Group representatives completed a survey about programs that improve the lives of children in military families in their own country. Submitted programs were categorized by primary audience and intervention type. Task Group members subsequently completed a survey indicating whether their country offered a program in each category.

Results: The presentation reviews similarities and differences among twenty-seven programs that were submitted and categorized by type: informational/educational resources/support centers, financial support for education, financial support for material necessities or hobbies, , family retreats, couples retreats, camps for children, family-level programs, couple-level programs, parenting classes, intervention/support groups for children and teenagers, online counseling, books for children, and wellness mobile apps. The presentation discusses the ways in which program offerings in each country appears to be influenced by size of the military, the degree to which military life if separate or consistent with civilian life, and the access to universal and preventive healthcare.

Conclusion: The landscape analysis of available family programs allows for transnational comparison of family-level services for military and veteran families. There are innovative and evidence-based programs that exist and could be adopted and adapted for use in other countries. The sharing of best-practice models may lead to cultural customization for implementation within the local systems while also pointing to the need for practice-based evidence to influence the ways in which evidence-based programs are adapted.

4E05: An Integrative Review of Measures Assessing the Well-being of Children from Military Families (5 of 5)

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Introduction: There is a dearth of systematic evaluations on the effectiveness of preventive measures and interventions directed at children from military families. Outcome measures of child wellbeing in epidemiological and intervention studies vary substantially. There is a need for the use of child wellbeing measures which allow both, systematic cross-national learning between NATO countries and intra-national comparisons between military and non-military families. Cross-national transfer of research and experience in this field can be facilitated by the use of few core cross-culturally valid instruments.

This integrative literature review aims at recommending child wellbeing measures in the military context. These measures should allow both (1) identifying risk and protective factors for children from mil-

itary families across NATO member countries in cross-sectional and longitudinal surveys and (2) the systematic evaluation of factors leading to program success across these countries.

Methodology: The Center for Military Mental Health of the GAF has carried out an integrative literature review of child wellbeing measures in orientation at the PRISMA analysis. Measures that fit the inclusion criteria were evaluated in respect to how well they fulfil five requirements: (1) Covering relevant domains and target groups for child wellbeing of children from military families in different nations, (2) the potential to identify risk and protective factors for children from military families, (3) to inform social, educational and health care policy, programs and interventions, (4) to allow cross-national and intra-national comparisons of child wellbeing from military and non-military families and (5) the sustainable use in large-scale cross-sectional and longitudinal surveys.

Results: The recommended child wellbeing measures included are four generic health-related Quality of Life measures (PedsQl 4.0, KID-SCREEN-52, DCGM-37, KINDL-R) and four screening measures for mental health (ASEBA, CHQ, PSC, SDQ). High SE and SP values (.70) for the mental health screening instruments occurred in 30–55% of the studies reviewed. The KIDSCREEN-52, which is the dominant HrQoL instrument in Europe, covers most of the requirements. The HrQoL instrument mostly used in the US is the PedsQL.

Conclusion: There is no gold standard for a child wellbeing measure. However, the combination of a mental health screening instrument, the SDQ, with a HrQol instrument, the KIDSCREEN-52, is recommended due to their complementary advantages in respect to the requirements and evaluation criteria. Future comparability of items banks as the KIDSCREEN-52 and the PedsQL is aimed for by the US based PROMIS project.

6B02: Two-factor Formulation of Human Stress: Immunity and resilience

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Brief Description: The construct of human resilience has traditionally been viewed as uni-dimensional. This may be a costly error. Evidence suggests that human resilience is at least bi-variate and bi-dimensional. This paper shall present a new heuristic and review evidence for a two-factor construction of human resilience and specific tactics associated with fostering both dimensions. Proactive and reactive interventions shall be discussed.

Outcomes: The current paper reviews research using diverse variables to support its claim of two factor of resilience.

Patient Population: Diverse subject populations were used in the review.

Conclusion: Uni-variate constructions of resilience focus upon either proactive factors, reactive factors, or unknowingly combine the two. Regardless, without clearly delineating the nature, mechanisms of action, and respective intervention tactics opportunities to reduce psychological morbidity such as posttraumatic stress will be limited. A two-factor formulation of human resilience expands the tools available to prevent disability stress reactions, especially in military and first responder populations.

6B04: Post-deployment Reintegration Satisfaction among Primary Army Reservists

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Department of National Defence

Introduction: Reservists, unlike Regular Force members, primarily serve part-time, however they contribute significantly to domestic and international operations, consisting of nearly one fifth of deployed forces. As Reservists are not obligated, but instead volunteer for deployments, there are particular post-deployment reintegration challenges that are uniquely associated with being a Reservist, such as maintaining civilian employment, abrupt separation from the deployed unit, and restrictions associated with entitlements to military medical and mental health services. The current research examined Canadian Armed Forces (CAF) Primary Army Reservists' satisfaction with the post-deployment reintegration experience, employing a qualitative approach, in order to explore the central themes discussed by Reservists and identify targets for process improvement.

Methodology: An online mixed-methods survey was conducted, containing questions specifically tailored to assess military- and Reservist-related health and wellness. The questions developed for this survey consisted of both open- and closed-ended format. Specifically, the current research focused on the responses to the following open-ended question: "Please explain your level of satisfaction with your post-deployment reintegration experience." Responses were coded by two independent raters by source (e.g., health services, home unit, etc.), by process (e.g., support, follow-up), and by valence (negative, positive, or neutral). Of the participants ($n = 192$) who provided responses, 165 had responses that were codeable. Of those responses, 88.5% were coded as negative in valence, thus they were our primary focus. An additional follow-up open-ended question queried which factors (if any) could have facilitated their post-deployment reintegration experience.

Results: Four main themes emerged: (1) the reintegration process itself, (2) follow-up, (3) support, and (4) employment. Over half of the participants reported that their reintegration was lacking or completely non-existent. Nearly half of the participants reported that more follow-up was needed post-deployment, particularly by the home unit and the unit they deployed with. Over one third of participants reported that more support was needed, especially from health services and the home unit. Finally, one third of participants discussed employment concerns, particularly with regards to securing employment with the home unit post-deployment. Responses to the follow-up factors question confirmed initial pattern of findings. Impact of deployment-related injury and deployment era on reintegration satisfaction is also explored.

Conclusion: CAF Primary Army Reservists who have deployed reported concerns related to a lack of post-deployment reintegration, insufficient follow-up and support, particularly by the home unit, as well as concerns with post-deployment employment. Recommendations for improving the post-deployment reintegration process for Reservists are discussed.

6C01: Ten years of R2MR: How the Road to Mental Readiness (R2MR) program has evolved from 2008-2018

*Bailey, Suzanne, MSW; Guest, Kimberly, MSW

Department of National Defence

Brief Description: Established in 2008 under the Mental Health and Operational Stress Injury Speaker's Bureau, the Road to Mental Readiness (R2MR) program has become the largest standardized mental health and resilience training program in the Canadian Armed Forces (CAF). Beginning with training for new recruits and junior leaders, the program has grown to include training content tailored for all environments, leadership training at various levels, pre and post deployment sessions for members and families, as well as occupation specific training for certain high risk occupations. More recently, R2MR has also been adapted for Public Safety personnel in Canada and includes modules on intervention with persons in crisis and those at risk of suicide. While primary prevention programs have an inherent appeal to them, careful evaluation and research is critical to ensuring that they meet identified objectives and do not unintentionally cause harm.

Clinical Outcomes: Focused on both prevention and performance, R2MR content aims to increase mental health literacy in order to increase early recognition of distress and access to care. The performance aspects of the program include skills to manage the physiological responses to stress, thereby providing tools to enhance performance in demanding situations. Outcome data from various courses will demonstrate the impact of the training on knowledge and attitudes toward mental health, as well as confidence to recognize distress and access resources. Program evaluation data from specific portions of R2MR, such as the mental skills coaching course, will outline areas for further research and program development.

Patient Population: R2MR is primarily targeted to serving CAF personnel, however, it includes training for families and is being expanded to address the needs of those who are transitioning from military to civilian life. It has also been adapted for Public Safety personnel in Canada.

Conclusion: In addition to summarizing the evolution of the R2MR program, this session will highlight the importance of program evaluation and research in ensuring that identified objectives are met, and that large scale programs are implemented with fidelity and in a standardized fashion.

6C02: Interim (Mid-way) Results from a Group Randomized Control Trial to Test the Efficacy of the Road to Mental Readiness Program at Basic Military Qualification (1 of 4)

*Fikretoglu, Deniz, PhD[1]; Liu, Aihua, PhD[2]; Blackler, Kristen, Masters[1]; Nazarov, Anthony, PhD[1]

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Introduction: The Road to Mental Readiness (R2MR) program is the standard mental health education and resilience building program in the Canadian Armed Forces (CAF). To date, the efficacy of R2MR has not been tested. Here, we report interim (i.e., mid-way) results from a group randomized control trial (GRCT) to test the efficacy of R2MR, during CAF members' first exposure to R2MR, in Basic Military Qualification (BMQ). Full trial results will be presented at the forum.

Methodology: Twenty-nine Anglophone Non-Commissioned Member (NCM) recruit platoons were randomized to an Intervention (n=15, R2MR at week 2 of the BMQ) or a Delayed Intervention Control (n=14, R2MR at week 9 of the BMQ) group. Psychological health (Patient Health Questionnaire, PHQ-9; Generalized Anxiety Disorder Scale, GAD-7; Kessler Psychological Distress Scale, K-10; and the Subjective Units of Discomfort Scale (SUDS), resilience (Connor-Davidson Resilience Scale, CD-RISC), and mental health service use attitudes and intentions (CAF Mental Health Service Use Questionnaire, CAF-MHSUQ)

were assessed at three timepoints: around week 2 (a day or two before the Intervention group received R2MR; Baseline/T1), around week 5 (towards the middle of the BMQ; T2), and around week 9 (towards the end of the BMQ, a day or two before the control group received R2MR; T3). BMQ performance data were obtained from an administrative database. Mixed linear models (assuming random intercepts and slopes to account for platoon-level differences) for continuous outcomes and generalized linear mixed models for binary outcomes were used to determine whether R2MR has beneficial effects on psychological health, resilience, mental health service use (MHSU) attitudes and intentions, and military performance.

Results: There were 1267 participants at Baseline, 980 at Followup1, and 847 at Follow-up2. At T2 and T3, there were no statistically significant differences between the Intervention and Control groups (i.e., no beneficial effects for R2MR) for psychological health, resilience, and military performance variables. One of 7 MHSU attitudinal variables, Affective Attitudes, showed beneficial effects for R2MR (Cohen's d=.11, p=0.059 at T2; Cohen's d=.15, p=0.039 at T3). There were no beneficial effects for BMQ performance.

Conclusion: Interim results found-with one exception- no beneficial effects for R2MR. These results differ from those of the pilot GRCT, reported last year at the forum, where six out of seven MHSU variables showed beneficial effects at T3, with effect sizes of d=.24 to .33. We discuss possible explanations for these findings, as well as the decision to conduct additional analyses to test possible explanations.

6C03: The Effects of Intervention Fidelity on Efficacy in the Group Randomized Control Trial of the Road to Mental Readiness Program at Basic Military Qualification (2 of 4)

*Fikretoglu, Deniz, PhD[1]; Liu, Aihua, PhD[2]; Blackler, Kristen, MA[1]; Nazarov, Anthony, PhD[1]

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Introduction: Interim (i.e., mid-way) results from a group randomized control trial (GRCT) to test the efficacy of R2MR in Basic Military Qualification (BMQ) indicated an absence of beneficial effects. These findings were in contrast to earlier findings from smaller studies in which consistent beneficial effects were found for mental health service use (MHSU) attitudes and intentions. We wanted to see whether the absence of beneficial effects at the interim point could at least be partially explained by failure to adhere to standard R2MR content.

Methodology: Twenty-nine Anglophone Non-Commissioned Member (NCM) recruit platoons were randomized in blocks to an Intervention (n=15, R2MR at week 2 of the BMQ) or a Delayed Intervention Control (n=14, R2MR at week 9 of the BMQ) group. Psychological health, resilience, and MHSU attitudes and intentions were assessed at three time points: around week 2 (T1), around week 5 (T2), and around week 9 (T3). Of the 15 Intervention platoons, 4 had undergone an Intervention Fidelity Check by an independent observer. Together with their 4 control platoons from the same randomization block, these platoons constituted Group 1 (With Fidelity Check). Group 2 (Without Fidelity Check), was comprised of the remaining 11 Intervention and 10 Control platoons. Given the randomization and allocation were done by blocks, each of the two groups could be treated as an independent GRCT. We re-assessed efficacy across the two groups using mixed linear models assuming random intercepts and slopes to account for platoon-level differences for continuous outcomes and generalized linear mixed models for binary outcomes. Analyses to examine time effects (i.e., increasingly drifting from standard R2MR material) were also conducted.

Results: For Group 1, for most of the outcomes at T2 and T3, R2MR showed beneficial effects. Compared to the Control platoons, the Intervention platoons had lower psychological distress, higher resilience, and more positive MHSU attitudes. In contrast, for Group 2, for most of the outcomes at T2 and T3, R2MR showed no beneficial effects or even negative effects. Compared to the Control platoons, the Intervention platoons had higher or similar psychological distress, lower resilience, and almost identical MHSU attitudes. Additional analyses provided evidence for decreasing efficacy over time.

Conclusion: Adherence or fidelity can affect intervention efficacy. In interim analyses in the ongoing GRCT for R2MR, we found evidence for poor adherence and drift over time. We discuss efforts to improve fidelity in the remainder of the GRCT and the effects of these efforts.

6C04: Improving Adherence to the Standard Road to Mental Readiness (R2MR) Content in the Group Randomized Control Trial of R2MR at Basic Military Qualification (3 of 4)

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Introduction: Interim (i.e., mid-way) results from a group randomized control trial (GRCT) to test the efficacy of R2MR in Basic Military Qualification (BMQ) indicated that the failure to see beneficial effects was associated with the lack of adherence to standard R2MR content. In response to these findings, exhaustive fidelity assessments were undertaken, along with after action review (AAR) with the R2MR instructor. We wanted to see whether conducting more frequent fidelity assessments and instituting AAR increased adherence to the R2MR content over time.

Methodology: Following the interim timepoint, two Delayed Intervention Control (i.e., R2MR at week 9 of the BMQ) groups were observed by the Principal Investigator (PI) and a new observer (NO) was trained to conduct comprehensive fidelity assessments. Assessment of fidelity was directed towards the three primary components of R2MR (i.e., Big 4 skills, Mental Health Continuum Model (MHCM), attitudes surrounding mental health service use (MHSU)) and scenario group-work. Following the fidelity assessment training, the NO observed 8 Intervention (i.e., R2MR at week 2 of the BMQ) groups that remained in the GRCT and assessed adherence to the R2MR content. After each observation by NO, the PI provided detailed AAR notes through a follow-up email to the R2MR trainer. Longitudinal patterns in quality of R2MR delivery were assessed using qualitative approaches.

Results: Key problems that were identified during the initial control group observations included: (a) significant lack of adherence to key speaker notes across all three R2MR components (omissions and ordering), (b) insertion of contradictory material to the Big 4 and MHSU attitudes components, (c) poorly conducted exercises for two Big 4 skills, and (d) lack of adherence to suggested timing. Consistent improvements were seen across all identified problems after more frequent fidelity assessments and AAR was implemented. Aside from minor speaker note omissions that remained for the MHCM component, adherence to standard R2MR content was near-perfect during the observation of final groups.

Conclusion: We demonstrate that (a) during the first half of the GRCT, there was a substantial lack of adherence to standard R2MR content

when there was no fidelity assessment, and (b) more frequent fidelity assessment and AAR/feedback after each R2MR session incrementally improved adherence to standard R2MR content across time. We discuss the importance of fidelity assessments and their implications not just in GRCTs but perhaps more importantly, in program evaluation and quality assurance of program delivery.

6C05: Putting Knowledge into Action in the Group Randomized Control Trial (GRCT) of the Road to Mental Readiness (R2MR): The perspective of knowledge users (4 of 4)

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Department of National Defence

Introduction: According to the Canadian Institutes of Health Research (CIHR), Knowledge Translation (KT) is "a dynamic and iterative process that includes synthesis, dissemination, exchange and ethically sound application of knowledge to improve .... health [and] .. health services.. KT is of critical importance to health research, [since] the creation of new knowledge often does not, on its own, lead to widespread implementation or impacts on health." In this presentation, we discuss KT efforts in the group randomized control trial (GRCT) on the Road to Mental Readiness (R2MR) program, from the perspective of knowledge users.

Methodology: In the GRCT on R2MR at Basic Military Qualification (BMQ), an integrated KT (iKT) approach was taken. That is, knowledge users (i.e., senior advisors and program administrators in the CDirector General Health Services (DGHS) and the military leaders at the Canadian Forces Leadership and Recruit School (CFLRS) were involved in each stage of the research process including the development and refinement of the research questions, selection of methodology, data collection and tools development, selection of outcome measures, interpretation of the findings, dissemination and application of the results, and development of subsequent rounds of research.

Results: There were a number of challenges and inherent tensions with respect to formulating the research questions and the research approach. For instance, DGHS was interested in answering not just the primary question of "does R2MR work" but also a vast array of additional questions (e.g., does it work equally well in all subgroups, which aspects of R2MR are responsible for which effects, etc.), not all of which could be addressed in the GRCT. CFLRS had concerns about the use of a true (i.e., no R2MR) control group and advocated for a wait-list control group so that all recruits would receive R2MR. CFLRS also raised concerns about their ability to support an intensive data collection plan within the context of a busy training school. While there was board agreement about the meaning and implications of the key findings on fidelity and efficacy for program administration and policy, and for future research, a number of challenges (e.g., resources, cost) exist and have to be overcome in "putting knowledge into action".

Conclusion: KT is by no means a simple process. In the context of the R2MR RCT, we discuss barriers and facilitators to KT, some of which may be unique to military settings, whereas others are likely to be more globally relevant.

Poster Presentations

P109: The Effect of the Cognitive Behavioral Therapy Group for Insomnia Program at Canadian Forces Health Services Centre Atlantic on Patients´ Insomnia, Depressive and Anxiety Symptoms, Dysfunctional Beliefs about Sleep and Sleep Efficiency

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Department of National Defence

Brief Description: Based on training conducted by Colleen E. Carney, PhD, a Cognitive Behavioral Therapy Group for Insomnia (CBT-I) program was developed by MH clinicians. The first pilot serial of this new program was delivered in May of 2017. Each serial consists of a five-week, two-hour weekly group program. Participants are asked to complete questionnaires that measure their insomnia symptoms, attitudes about sleep, and whether they experience depression or anxiety in their lives at intake, at the end of session 5 and three months following the completion of the program. Preliminary results demonstrated a marked improvement in quality of sleep and a decrease in feelings of depression and anxiety.

The American College of Physicians (ACP) recommends CBT-I as a first line treatment for insomnia (Kathol & Arnedt, 2016). This approach addresses the perpetuating factors of insomnia, specifically sleep thoughts (cognitions) and sleep behaviors (habits). CBT-I therapists teach cognitive and behavioral skills that resolve or attenuate chronic insomnia in 70% to 80% of treated persons, often without supplemental medication (Kathol & Arnedt, 2016). Additionally, a meta-analysis completed in 2018 showed significant effects for individual face-to-face CBT-I on depressive symptoms (Ballesio et al., 2018). Some studies also support its long-term benefits months after completion of the treatment (Riemann & Perlis, 2009).

Clinical Outcomes: The outcome measures selected for use in this clinical initiative included Insomnia Severity Index (ISI), Patient Health Questionnaire-9 (PHQ-9), General Anxiety Disorder-7 (GAD-7), Dysfunctional Beliefs about Sleep-16 (DBAS-16) and Sleep Efficiency (SE%). These were chosen as they are evidenced based measures for insomnia research. Data includes a group of 25 participants that have completed the program.

Patient Population: CAF military personnel referred to the CBT-I program by primary care and mental health clinicians, according to predetermined inclusion and exclusion criteria.

Conclusion: 80% to 90% of participants that completed the program had significant improvement in sleep. CBT-I has demonstrated that it is an effective treatment for insomnia that produces positive results in a brief amount of time. Research shows that CBT-I is more effective than medications for treatment of insomnia six months or more after therapy is complete (Mitchell et al., 2012). The one year CBT-I pilot program at Canadian Forces Health Services Center - Atlantic has shown that it is an effective tool for military members experiencing sleep issues. Ultimately, it would be beneficial to expand this program to other bases as an effective means of managing insomnia in the military population.

P110: The Role of Subjective Self-mapping in the Road to Mental Readiness Mental Health Continuum Model

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Department of National Defence

Introduction: To complement the Road to Mental Readiness (R2MR) training, a mobile application (i.e., "app") was developed and launched via iTunes and Google Play to provide military personnel and civilians with information and strategies to cope with stress and improve resiliency. One of the functions of the R2MR mobile app, the Mental Health Continuum Model (MHCM), allows users to monitor their behavioural signs on six functional domains. The app allows users to rate their current perceived mental health state (e.g., mood) using a slider that represents the four health categories of the continuum (i.e., healthy, reacting, injured, and ill). Given the novelty of the MHCM use as a self-monitoring tool and its recent implementation on mobile devices, research is needed to (1) determine whether the current wording of the descriptors from the MHCM correspond to (i) the four MHCM health categories, and (ii) the in-app visual representation of the continuum, and (2) better understand how Canadian Armed Forces (CAF) members map themselves with respect to each functional domain as assessed by well-established scales.

Methodology: Data is being collected from 650 active Regular and Reserve Force CAF members. Participants are randomly assigned to one of four groups. Participants assigned to the first group are shown descriptors *only* (without the visual spectrum) and indicate which descriptors match their current state. Participants are also shown the visual spectrum of the slider *only* (without the descriptors) and identify where they fall on the continuum. The second group is presented with the visual spectrum which includes anchors. Participants assigned to the third group map their current state on the MHCM as is presented in the mobile app. The fourth group is presented with the visual spectrum with the anchors and categories. All participants complete existing measures of mental health and well-being on each of the functional domains.

Results: Data collection is currently in progress; results are forthcoming.

Conclusion: The results of the proposed research study will contribute to developing scientific evidence relating to R2MR within the mobile app. Identifying potential ways of improving upon the self-monitoring tool and the presentation of the MHCM will guide future iterations and updates of the mobile app and ultimately improve upon the user experience. Additionally, the results may provide evidence to help guide future R2MR training content.

P111: The Relationship of Non-combat Stressors and Well-being in the U.S. Army

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Introduction: Combat exposure and its effect on soldier well-being has received significant attention in recent years (Watkins, 2014), particularly since the start of the wars in Iraq and Afghanistan. However, many factors are known to affect the well-being of military person-nel. Moreover, in recent years, U.S. combat operations have decreased, and consequently, a large proportion of soldiers have not experienced combat. It is important to assess non-combat related stressors that may occur in garrison and how they may impact soldier health, above and beyond combat exposure.

Methodology: Paper questionnaires were distributed to 271 active duty soldiers at a large U.S. military installation. Soldiers completed combat experiences, PTSD symptoms, generalized anxiety, depression, insomnia, functional impairment, alcohol misuse, aggressive behaviors, and marital satisfaction measures. A 16 item scale measuring various non-combat stressors was also included (e.g., lack of meaningful work, not doing what I was trained to do, balancing work and home demands, difficult commute). Exploratory factor were conducted analyses on the non-combat stressors to assess how they functioned together. Binary logistic and linear regressions were conducted on the 8 social and behavioral health outcomes, with combat experiences and non-combat stressor components entered as predictors.

Results: A factor analysis of the non-combat stressors yielded 2 factors; the first comprised of 5 items and the second comprised of 3 items. The first factor broadly relates to work context stressors (e.g., balancing demands of work and home, not being able to take requested leave, difficult commute). The second factor pertains to work content stressors (not being recognized for contributions, lack of meaningful work, not doing what I was trained to do).

Regression analyses yielded significant associations between work context stressors and PTSD, anxiety, depression, insomnia, functional impairment, and aggressive behaviors, controlling for combat experiences. Work content stressors were significantly associated with PTSD, anxiety, depression, insomnia, functional impairment, and aggressive behaviors, controlling for combat experiences. Neither factors were associated with alcohol misuse or relationship satisfaction.

Conclusion: These results demonstrate the impact of non-combat stressors on various adverse outcomes related to social and behavioral health, above and beyond the effects of combat experiences. Additionally, the results highlight the importance of taking a comprehensive approach to work stress by investigating how different categories of work stressors impact soldier well-being (Campbell & Nobel, 2009). Future research should explore the effects of military specific non-combat stressors on relevant outcomes.

P112: Psychosocial Factors Contributing to Transition Difficulties for Releasing Service Members

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Brief Description: A literature review was completed utilizing literature based on transitioning military members with a cross reference of literature discussing the issues of professional athletes facing retirement. The life situations facing retiring athletes present parallel issues to those of releasing service members. Psychosocial interventions for releasing service members have been minimally formalized and developed to this point. As the issue of providing care to veterans draws further attention, a Health Services response at developing proactive supportive measures in incumbent.

Outcomes: The literature review identifies findings that give rise to elements for the development of psychosocial interventions for ser-

vice members. Literature identifies the perception of control as a driver to explore emotional readiness and for the management of loss and change. Six variables have been identified in literature which have a positive relationship to difficulty with transition. Those serving in a combat zone, have had an emotionally traumatic experience or serious related injury, knew someone killed or injured, served in the post 9/11 era and those married while serving in the post 9/11 era were seen as being more likely to have a difficult transition. Factors for easier transitions were noted as those being commissioned officers, have graduated from college, were able to voice clear understandings of their missions and those with higher levels of religious beliefs and spiritual service attendance. The greatest risk for transition difficulty presented as those with emotional or physical trauma.

Literature related to professional athletes identifies the concepts of athlete identity and involuntary retirement as keys elements in determining transition difficulty as the stronger the identity, the more difficult the transition, while involuntary retirement from sports represents loss of prestige and the greatest risk to adjustment issues. Many elements are identified in the quality of career transition for athletes. Career achievements, early disengagement, coping strategies, psychosocial supports and support programs are further identified elements having positive relationships with transition success.

Patient Population: The population that programming from this literature review is geared toward is acting service members in any stage of progress toward releasing from service. There is practice application for Veterans and families as well as those in any stage of transition will benefit from supportive services as needed.

Conclusion: The literature review identifies numerous elements which lend support to the need for psychosocial supports for service members facing release. The literature on athlete retirement lends parallel concepts indicating transition supports similar to those of military members.

P113: #HERE4U Using AI Technology to Improve the Care of Military Personnel, Veterans and Their Families

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Introduction: How the future of AI technologies will lead to better outcomes in mental wellness support. This talk will explore how we are using artificial intelligence and machine learning technologies and techniques to help people lead better lives and connect them with assistance sooner. Technology and clinical resources can be seamlessly integrated to provide a cost-effective preventative solution. We will discuss what we built so far, and how we will digitally to support this critical need. It is a powerful partnership of Queen's expertise/research, Canadian Military and IBM's technology.

The #HERE4U Military Edition will be a chatbot that will connect adult military personnel and family members to a mental health application that uses the IBM Watson AI. Users will carry on a conversation with the chatbot. Watson will ask questions, suggest tools and resources, and refer the user to a clinically vetted mental health resources as appropriate. If the user wishes to speak to a counsellor, or if Watson determines that this would be beneficial, they will be handed off to a live counsellor to continue the conversation.

When the user is transferred to a counsellor, the support does not stop there. Watson ingests the conversations and the counsellors chosen responses, it will use this to learn so that it can provide counsellors with recommended responses and the reason why the response would be appropriate.

Methodology: We have targeted military families as a high-risk group for mental health challenges because of their stressful living conditions including exposure to trauma, long separations, frequent moves, culture of resilience. We are leveraging IBM Design thinking to focus the solution on the target users and building in an iterative approach so that we can monitor how users' behaviours change through use of the tool.

Results: Mental health issues affect a large percentage of the military population. Military families who require mental health supports may struggle to find timely and appropriate care from providers who are knowledgeable about military life. We expect that the #HERE4U application will extend service coverage with the goal of identifying and appropriately managing a full range of mental and behavioural health questions and issues, including referral to a live counsellor if needed.

Conclusion: Immediate access to a text-based application may overcome barriers to care and reduce the burden of mental ill health on military families in Canada and elsewhere.

P114: Mental Health Service Utilization in Depressed Canadian Armed Forces Personnel

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Introduction: Major depression is prevalent, impactful, and treatable in military populations, but not all depressed personnel seek professional care in a given year. Care-seeking patterns (including the use of primary vs. specialty care), and factors associated with the likelihood of mental health service utilization in depressed military personnel are poorly understood.

Methodology: Our sample was 520 Regular Force respondents to the 2013 Canadian Forces Mental Health Survey. All subjects had past-year major depression. Subjects reported whether they had spoken about their mental health with at least one health professional in the past 12 months. We used multivariate Poisson regression to explore factors associated with past-year mental health service use.

Results: Three-quarters of Canadian military personnel with past-year depression had sought mental health care in the previous 12 months. Among care-seeking personnel, 70% had seen a psychologist or psychiatrist, while 5% had exclusively received care from a primary care physician. Belief in the effectiveness of mental health care was the factor most strongly associated with care-seeking. Female gender, functional impairments, and psychiatric comorbidities were also associated with care-seeking. Surprisingly, stigma perceptions had no independent association with care-seeking.

Conclusion: The proportion of depressed Canadian Armed Forces personnel who seek professional care, and who access specialty mental health care, is higher than in most other populations. However, an important minority of patients are not accessing health services. Efforts to further increase mental health service utilization in the Canadian military should continue to target beliefs about the effectiveness of mental health care.

P125: Comparing CAF Members and Civilian User Experience of the R2MR Mobile Application

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Department of National Defence

Introduction: The Canadian Armed Forces (CAF) are conducting a major effort to enhance the training provided to CAF members for mental health. The core of this effort is the Road to Mental Readiness (R2MR) program. In order to maximize retention and effectiveness, a mobile application consisting of seven training modules has been developed. Vigorous usability testing is necessary during the development of the R2MR mobile application in order to ensure it is a user-friendly complement to classroom training. As part of the validation process, we are examining users' (both CAF and civilian) impressions of specific features of the R2MR mobile app in order to understand different users' mental models and expectations regarding the app.

Methodology: Data were collected from a series of exploratory usability studies conducted on both CAF members and civilians. Participants were asked to explore the R2MR app modules on a mobile device using a Concurrent Think Aloud protocol: the facilitator asked participants to perform several tasks using the app while vocalizing everything they saw, did, thought and felt as they were completing the tasks. Participants also completed a standard usability measure (the System Usability Scale) and answered a series of specific questions on the functionality of each R2MR mobile app. Qualitative data were then analyzed according to human-centered design principles. Finally, mobile usage analytics were extracted to observe patterns of the mobile app usage.

Results: There were several notable differences in user preferences between the two populations. The CAF members were more accepting of the R2MR mobile app as a training tool compared to civilians. Also, the CAF members wanted to track their progress in the app relative to other members, whereas civilians were more interested in seeing their individual progress. Further development and enhancements are required based on findings of the usability studies to best complement the R2MR mobile application which is available to both CAF members and the general public. Data collection of mobile app usage analytics is currently in progress; results are forthcoming.

Conclusion: Usability testing and evaluation during all stages of mobile app development is crucial. Findings from user experience from both CAF and civilian population added valuable insight to enhancing the app's usability and understanding both populations' mental models. In order to continually improve and increase the usage and engagement of the R2MR mobile app, population-specific configuration based on regularly scheduled usability testing is recommended for maintenance of the app.

P126: Health and Well-being for those who Serve/Have Served Within the Armed Forces and Public Safety Roles

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Introduction: This scoping review will identify research that considers health and well-being for those who serve/have served within the armed forces and public safety roles. In the specific context of their work, military and public safety personnel (including Military Police

officers, correctional workers, etc.) are exposed to very different environments. They obey to distinct rules of engagement, yet both populations can be exposed to a wide range of traumatic stressors. PSP personnel have been previously screened positive for a mental disorder in a proportion of 44.5% (Carleton et al., 2017), while Canadian personnel deployed in Afghanistan were found to be experiencing PTSD in 13.5% of cases (Rebeira, Grootendorst & Coyne, 2017). Posttraumatic Stress Disorder (PTSD) has been the most discussed topic in recent past in scientific literature, even though there has also been a recent increase in the attention given to the concept of moral injury, and how these challenges are related to the concept of self identity, which, in turn seems to be related to the uniformed job they chose to embrace.

Methodology: The scoping review process is anchored in the 5-steps defined in Arksey and O'Malley's work (2005). Data will be aggregated and organized according to a charting form which would include a variety of categories separated along job status (active duty, Veterans, civilians, etc.), their diagnosis, their marital status, their moral perception of self, as well as factors or issues to be determined within the iterative process of the review. Variables for analysis will more specifically focus on mental health risks, mental health incidence and prevalence, acute versus chronic issues, nature, frequency, and dosing of critical incidents.

Results: As data has not yet been gathered, references will be identified as potential sources. A process of de-duplication and title/screening will be necessary to ensure that all articles within the review are unique. Once this process is completed, the remaining articles will be included in the final process which consists of extracting and analyzing the data. Through this process, themes will emerge and inform the results of the review.

Conclusion: As military and public safety personnel continue being exposed to various stressors and traumatizing experiences, the relevance of informed scientific knowledge on the issues these individuals gains an ever-increasing relevance. This scoping review aims to be a stepping stone from which future research can be oriented.

P132: Assessing and Managing Risk for Violence in Military Service Members and Veterans: A state-of-the-art review

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Brief Description: Although suicide in military populations is the focus of much research, assessment, and intervention, acts of violence perpetrated by military service members and veterans may be less understood, and is not well documented. The tragic cluster of homicides at Fort Carson in 2008, and the case of Lionel Desmond, a Canadian veteran who murdered his family in 2017, highlight the need to address worrisome rates of violence among military personnel, which includes assaults, sexual offenses, domestic violence, and homicide. It would seem, "The violence of war cannot be contained to the battlefield (Xenais, 2016)." This state-of-the-art literature review focuses on current academic and grey literature to offer an overview of the prevalence and types of violence perpetrated by military populations, examines case examples, and provides new perspectives on violence risk assessment and modification in clinical and organizational practice. Priorities for future research will be identified.

Outcomes: Research suggests that up to 30% of military personnel report perpetrating some form of violence in the previous year (Elbogen, 2012). Risk factors associated with violence in military populations

include substance use, combat intensity, prior misconduct, psychopathology, anger associated with post-traumatic stress disorder, and age. Protective factors are related to older age, social support, a sense of personal control, resilience, and financial stability. Assessment tools such as the Violence Screening and Assessment of Needs (VIO-SCAN), and measures that assess hostility and substance dependence may assist clinicians in identifying military service members and veterans at risk for violence. Evidence-based practices are effective in the management and modification of dynamic risk factors, enhance awareness of protective factors, and directly address cognitions associated with violence. A psychosocial rehabilitation framework can effectively assist military clients at risk for violence by providing for basic needs, adequately treating substance dependence and psychopathology, enhancing social support, and promoting resiliency.

Patient Population: This state of the art review examines violence in serving military personnel and veterans.

Conclusion: Perpetration of violence by military service members and veterans is prevalent and associated with risk factors such as substance use and psychopathology. Best practices used in civilian populations to assess, manage, and treat risk for violence may be applicable to military personnel, although issues specific to military experience, such as access to weapons and combat exposure, must be further explored.

P133: Moral injury, PTSD, Depression, Anxiety, and Stress in a Canadian Military and Veteran Sample: The mediating role of emotion dysregulation

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Introduction: Moral injury (MI), involving perceived betrayals of one's moral or ethical values or perceived transgressions (i.e., acts of commission or omission by oneself or others), has been the subject of increasing research interest. Despite this interest, the clinical correlates and mechanisms of MI remain poorly described. Here, we examine whether emotion dysregulation (ED), observed frequently in affective disorders, mediates the relation between MI, and symptoms of post-traumatic stress disorder (PTSD), depression, anxiety, and stress in a sample of Canadian military members and veterans.

Methodology: The Moral Injury Events Scale (MIES) was administered to Canadian military personnel and veterans. Measures assessing symptoms of PTSD, depression, anxiety, stress, and ED were also administered. Correlational and mediation analyses were then used to assess the direct and indirect relations between variables.

Results: Significant, positive correlations emerged between MI and PTSD symptoms of avoidance, MI and depression symptoms, and MI and ED. In addition, significant correlations emerged between perceived betrayal and depression severity, perceived betrayal and stress severity, and perceived betrayal and ED. The relation between perceived betrayal and PTSD symptom severity also trended towards significance. Critically, ED mediated the relations between MI and PTSD symptom severity, MI and depression symptoms, MI and anxiety symptoms, and MI and stress symptoms. Moreover, ED mediated the relations between perceived betrayal and symptoms of psychological dysfunction.

Conclusion: The results of the present study point towards ED as a potential mechanism of MI among Canadian military members and veterans. To date, existing interventions do not target specifically this component of symptom presentation. Future work is required to determine whether targeting symptoms of ED will have beneficial effect for recovery from MI.

P134: The Relation between Adverse Childhood Experiences and Moral Injury in the Canadian Armed Forces

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Introduction: There is increasing evidence that moral injuries affect the mental health of Canadian military members and veterans. Despite knowledge that moral injuries are related to multiple negative mental health outcomes, including the onset of PTSD, it is unknown whether pre-traumatic variables, including the presence of childhood abuse, are related to moral injuries.

Methodology: Patients newly admitted to an inpatient unit for treatment of trauma-related disorders received a standardized self-assessment package, including the PTSD Checklist for the DSM-5 (PCL-5), the Moral Injury Events Scale (MIES; adapted for the Canadian context), and the Adverse Childhood Experiences Questionnaire (ACE-Q).

Results: Analyses revealed a significant relation between childhood emotional abuse and the presence of moral injury in adulthood. Specifically, emotional abuse during childhood was correlated with total score on the MIES and with its two subscales, betrayal and transgressions.

Conclusion: Among Canadian military members and veterans, childhood events are related to the presence of moral injury during adulthood. These preliminary data are provocative in suggesting that emotional abuse during childhood may increase the likelihood of endorsing moral injury during adult military service. Further work is needed to identify pre-traumatic variables that may serve to increase risk or enhance resilience to the development of moral injury in military members.

P138: The Power of Social Responses in Treating and Preventing Traumatization: Wounded Warriors Canada Trauma Resiliency Program

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Brief Description: The Wounded Warriors Canada Trauma Resiliency Program (WW-TRP) is based on 20 years of clinical experience and research on group counselling approaches with military, veteran and first responder populations. The two-phase residential retreat program is designed to assist members in learning to both cope with and work through their traumatic memories, through psycho-education and extensive practice of trauma regulation skills and social response training.

Phase one (TRP1) focuses on teaching participants how to understand and use the TRP's BETR Model, Trauma Formula and FORGE Process in groups of 13-15 over three days. Phase two (TRP2) focuses helping a group of 6 participants, who have successfully completed TRP1 and are screened as suitable for TRP2, begin to work through one traumatic event or period of time of their choosing, while learning how to make sense of their experiences using an innovative group approach to working on traumatic memories: the 3-Part Narrative Construction (3PCN) Technique. There is considerable focus on social responses as a key to understanding how individuals become "traumatized" and in learning the power of social responses in healing from traumatic exposure.

Clinical Outcomes: The WWC-TRP is in the formative evaluation stage at the time of writing this abstract. Currently we are reviewing the approach and making changes to the protocol to insure consistency and participant feedback is incorporated. Following this stage of development, we will be choosing evaluation measures that target the main outcomes of the program for summative evaluation purposes.

Patient Population: Serving military, veterans, and first responders.

Conclusion: The focus on treating trauma for decades has been on the individual patient or client. The TRP establishes that social responses play a significant role in how individuals are traumatize and in how they heal. The TRP addresses the social isolation inherent in post-traumatic stress responses in a manner that cannot be accomplished with individual therapy alone. The TRP looks beyond the individual, addressing society's role in the development of traumatic reactions, complementing and enhancing individual treatment for traumatized populations.

P139: The Dissociative Freezing Response Onset Scale following Traumatic Stress: Assessing post-traumatic tonic immobility

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Introduction: Peri-traumatic tonic immobility (TI) is an important predictor of the development and course of PTSD. Despite serving as an adaptive defensive response, TI is a debilitating state that has the capacity to disrupt functioning across domains. At present, are no validated measures that assess specifically post-traumatic TI. The primary objective of this study was to evaluate the *Dissociative Freezing Response Onset Scale following Traumatic stress (D-FROST)*, a measure developed to assess specifically the presence and severity of post-traumatic TI across trauma-exposed populations. Here, TI is reconceptualised as a *dissociative freezing response* – a trauma-related dissociative state involving alterations across four dimensions of consciousness (body, thought, time-memory, and emotion).

Methodology: Participants ($N = 462$) with a history of TI completed the D-FROST, and measures of post-traumatic symptoms, dissociation, depression and anxiety. Exploratory and confirmatory factor analyses procedures were conducted.

Results: The D-FROST assessed four latent constructs, which were interpreted following the 4-D model of Trauma and Dissociation. Together, these factors capture precursors and dissociative experiences associated with TI as a trauma-related altered state, residual effects,

and the experience of altered sense of self. Notably, the residual effects of TI included feelings of shame, guilt, and embarrassment. D-FROST scales demonstrated excellent reliability, as well as good construct and convergent validity with other measures of dissociation and PTSD.

Conclusion: The D-FROST is the first comprehensive measure of post-traumatic TI conceptualized within a dissociative framework as a *dissociative freezing response*. This measure demonstrates excellent psychometric properties and may be useful for researchers and clinicians wishing to assess chronic forms of TI.

P140: Better Managing Post-traumatic Stress Disorder with Equine Assisted Therapy: A five year study

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Brief Description: Starting from March, 2013, Can Praxis has offered a unique equine assisted therapy (EAT) program targeting veteran couples struggling in their personal relationship(s) due to the effects of operational stress injury (OSI), including post-traumatic stress disorder (PTSD). This OSI-tailored therapy addresses a treatment gap resulting from the tendency to focus more on conventional medication treatment regimens for OSI. Therefore, a cognitive behavioral therapy approach has been utilized to focus on a key associated feature of OSI; chronic isolation leading to dysfunctional personal relationship(s). The therapy integrates a practical self-mediation process with horses utilized as teaching aids. Within a year, the target population was expanded to include at-risk couples from paramilitary and first-responder organizations.

Clinical Outcomes: Commensurate with the first EAT session, the program has undergone a rigorous and evolving evaluation process. After one year of pilot testing, two incremental phases were added towards improving client success in applying a self-mediation process. Outcome evaluation of the program is based on two short-term and two long-term indicators of client success. In the short-term, clients self-report on the extent to which OSI symptoms are better managed during the respective EAT session and the extent to which they have acquired a self-mediation process. In the long-term, following a minimum of three months, clients self-report on any sustained benefits of better managed OSI symptoms and whether their personal relationship(s) have improved.

Patient Population: Over 58 months, ending on December 31, 2017, 454 clients (227 couples) have completed Phase I. Towards acquiring a self-mediation process, 95.2% of diagnosed clients and 97.7% of their spouses/partners reported either 'Yes' or 'Maybe' about having acquired enough communication skills and knowledge to improve their personal relationship(s). Follow-up data has been obtained from 172 clients, based on an average of 10.6 months post Phase I. Follow-up findings are encouraging in that a high proportion of the 172 clients (89.0% or 153) reported improvement in their personal relationship(s). Specifically, 103 clients (59.9%) reported a definite 'Yes' and 50 clients (29.1%) reported improvements in their relationship(s) at least 'Sometimes' during the ensuing 10.6 months. T

Conclusion: These results, while encouraging, represent only the initial steps in a lengthy pilot testing process, necessarily protracted to facilitate the validation of a series of eight new self-report questionnaires. Such a lengthy and complex evaluation process is necessary towards eventually demonstrating an adequate contingency relationship between the EAT programming and client outcomes to establish this OSI-tailored program as an evidence-based therapy option.

PRIMARILY PHYSICAL HEALTH & WELL–BEING

Podium Presentations

1B04: Use of Mass Antibiotic Prophylaxis for an Outbreak of Group A Streptococcus among Canadian Armed Forces Military Recruits

*Lu, Diane, MD, PhD; Johnson, Noémie, MD; Gagnon, François, MD; Strauss, Barbara, MSc; Simkus, Kristen, MPH; Tepper, Martin, MD; *Barnes, Kirsten, MD*

Department of National Defence

Introduction: Saint-Jean Garrison located in Saint-Jean-sur-Richelieu, Quebec is the Basic Training Base for recruits in the Canadian Armed Forces (CAF). Between 27 Feb 18 and 10 Mar 18, among recruits, one confirmed invasive Group A Streptococcal (GAS) case, one probable invasive GAS case, and four others with varying levels of severity were hospitalized for a GAS infection. All were subsequently discharged from hospital. Antibiotic prophylaxis for close contacts was provided. The usual approaches to control were put in place, e.g., close contact prophylaxis, isolation of cases, and hygiene emphasis.

Methodology: In consultation with the local civilian public health department (Direction de santé publique de la Montérégie) and the Quebec Ministère de la santé et des services sociaux, the Canadian Forces Health Services (CFHS) launched a mass antibiotic prophylaxis (MAP) program aimed at the recruit population (both those currently in Saint-Jean Garrison and those arriving up until end of April 2018). Antibiotic prophylaxis included penicillin G benzathine (PGB) (intramuscular injection) or azithromycin (oral tablets) for penicillin allergic personnel. The intent of this treatment was to provide protection against invasive GAS among recruits generally, as well as to reduce the spread of GAS among this population. This approach has previously been shown to reduce GAS and invasive GAS illness among military personnel in the United States. This is the first time that such voluntary prophylaxis was used in the CAF.

Results: As of 26 Mar 18, 2023 members (1,823 recruits and 200 instructors), have received MAP. Of these personnel, 1,790 (88.5%) received PGB and 233 (11.5%) received azithromycin. Of all personnel offered MAP, 35 (1.7%) refused any prophylaxis. There have been no new cases of invasive or severe (hospitalized) GAS infections since 10 Mar 18. A decision as to whether to continue MAP will be made in early May 2018. Adverse events following MAP are being captured with a survey and severe events are being reported directly to CFHS. An Acute Respiratory Illness Surveillance System is in place to monitor the situation following MAP.

Conclusion: During an outbreak of invasive GAS among military recruits in 2018, a voluntary MAP program aimed at protecting the recruit population was implemented. The use of MAP was associated with a precipitous reduction in GAS infection among recruits. The long term effect of MAP will need to be followed closely.

1B05: Adverse Events following Mass Antibiotic Prophylaxis during a Group A Streptococcus Outbreak among Canadian Armed Forces Recruits

Lu, Diane, MD, PhD; Simkus, Kristen, MPH; Strauss, Barbara, MSc; Johnson, Noémie, MD; Gagnon, François, MD; Tepper, Martin, MD; Barnes, Kirsten, MD

Department of National Defence

Introduction: Between December 2016 and May 2017, a novel Group A Streptococcal (GAS) outbreak occurred among recruits at the Canadian Forces Leadership and Recruit School (CFLRS). In February 2018 a second GAS outbreak occurred among recruits. For both outbreaks, prophylactic antibiotics were given to prevent disease for close contacts of invasive cases and the usual infection control practices were implemented. After the declaration of the 2018 outbreak, the Canadian Forces Health Services (CFHS) launched a voluntary mass antibiotic prophylaxis (MAP) program to prevent recruits from acquiring this infection. Antibiotic prophylaxis included intramuscular penicillin G benzathine (PGB) or azithromycin (oral) for penicillin allergic personnel. Although MAP has been used among the US military recruits for decades, this was the first time in the CAF. It was, therefore, important to monitor not only the benefits but also the side effects among personnel who received MAP.

Methodology: A MAP adverse events paper survey was developed and administered to recruits and staff one week after being offered MAP. The anonymous, voluntary survey collected data on the type of antibiotic received, pain at the injection site for PGB, other commonly reported symptoms associated with PGB and azithromycin, and if MAP interfered with the completion of their training. A line list was also developed for clinicians to complete for those personnel who were assessed at the Base Medical Clinic for serious or unusual adverse events related to MAP.

Results: Between 7-27 March 2018, 2023 CAF personnel at the CFLRS (1823 recruits, 200 instructors) received MAP. Of these personnel, 1790 (88.5%) received PGB and 233 (11.5%) received azithromycin. 98.3% of personnel were compliant with the MAP program. The percentage of common side effects from the surveys will be presented, in addition to the percentage of recruits whose training was affected. Four recruits and one staff member sought medical care due to MAP. The five serious adverse events included an anaphylactic reaction, compartment syndrome with rhabdomyolysis and subsequent acute kidney injury, a hematoma at the injection site, excess vomiting, and a cellulitis.

Conclusion: This is the first time MAP has been used in the CAF to control a GAS outbreak. Very few personnel (less than 0.3%) required medical care for a serious adverse reaction related to MAP. Information from the self-administered survey will provide additional information on side effects and training outcomes related to receipt of MAP which will help inform future interventions in this population.

2B01: Preliminary Results from the Correlation between Analgesics & Long-term Function Study Following Ankle Sprains Study

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Introduction: Recent practice guidelines report 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 acute LAS receiving NSAIDs have led to concerns of adverse effects on healing and delayed rehabilitation. Studies have 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 effects. Therefore, the objective of this pragmatic randomized controlled trial is to determine the effect of adding analgesics/NSAIDs to a standardized rehabilitation program over longer term 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. 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. Primary outcome in this study is the mean difference between groups in the Foot & Ankle Abilities Measure between baseline and 3 months. Secondary outcomes include the mean difference between groups in clinical measures of pain, swelling, mobility, static and dynamic stability. To determine a statistically significant difference between groups with a two-sided significance of 0.05, a power of 80%, and an estimated attrition rate of 25%, 40 subjects/group are required (n=160).

Results: To date, 79 subjects have been randomized into either the; no medication (n=20, 27.3±8.7years), acetaminophen (n=21, 28.8±6.9years), celecoxib (n=18, 30.2±6.9years), or naproxen (n=20, 32.5±9.9years) groups. All subjects have reported clinically relevant changes in pain and self-reported function between baseline and 3 months, without any signs of static instability. Interestingly, there is a trend suggesting that only subjects in the no medication and acetaminophen groups have reported clinically relevant changes in swelling.

Conclusion: The pragmatic nature of this RCT and the training demands of CAF members have challenged subject enrollment and follow-up. To date, all subjects have reported clinically relevant differences in pain & self-reported function, without any signs of static stability. The results of this study address some of the limitations of the current research on analgesics/NSAIDs in the management of ligament injuries & offers practical guidance to clinicians on the use of adjunct pharmacological interventions for CAF members with acute LAS.

2B02: Can a Knowledge Translation Intervention Improve the Evidence-based Management of 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 rehabilitation interventions and limited outcome measures. A subsequent focus group reported their preferred knowledge translation (KT) strategies and specific implementation facilitators/barriers perceived to influence their integration of research knowledge into clinical practice. The purpose of this research project was to use a comprehensive implementation strategy that applies KT interventions tailored to the preferences and 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 Physiotherapists practicing in CAF Health Services Centres were sent an email invitation to participate in this project by completing an online questionnaire investigating their knowledge of and use of rehabilitation interventions and outcome measures

recommended in the management of LAS. A comprehensive, active, multi-component KT intervention including summarized research knowledge, point-of-care practice tools and guided interactive peer discussion on the rehabilitation interventions and outcome measures recommended in the management of LAS was then delivered to CAF Physiotherapists via a distance learning platform. The primary outcome for this project was the median change reported on the online questionnaire between baseline and 6 months.

Results: Our response rate to the online questionnaire at 6 months was 64% (n=43/67). Following participation in distance learning, most respondents reported excellent familiarity with and use of the recommended interventions, while their familiarity with and use of outcome measures ranged from good to excellent. The most frequent reason respondents provided for non-use was the habitual use of another outcome measure. Overall, 65% of respondents acknowledged a change in knowledge and 55% acknowledged a change in practice. All respondents reported interest in participating in similar distance learning opportunities, with a preference reported for summarized research over peer interaction or practice tools.

Conclusion: A KT implementation strategy tailored to CAF Physiotherapists improved their knowledge of and use of interventions and outcome measures recommended in LAS management. Practical suggestions to improve KT intervention implementation strategies for CAF Physiotherapists and allied health care professionals are provided.

2B03: Fractures in the Canadian Armed Forces: A bias-adjusted analysis of cause, operational impact and cost

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Department of National Defence

Introduction: Musculoskeletal injuries are one of the leading causes of attrition from the Canadian Armed Forces (CAF) and their reduction has been identified as a priority topic in health research. This study follows previous research on fractures in the CAF and builds upon it by using additional data sources to capture fracture cases which were managed in CAF clinics. The examination of injury distribution with personal and organizational risk factors will inform preventive action and improve operational readiness.

Methodology: The CAF Health Evaluations and Reporting Outcomes (HERO) surveillance system was used to identify cases of fractures managed in military and civilian healthcare centers, and their contributing mechanism of injury.

The CAF Master Patient Index was used to identify all Regular Force personnel enlisted between 01 Jan 2014 and 31 Dec 2016. Fracture-specific billing codes from provincial and territorial physician fee guides were linked to the CAF Blue Cross (BC) health insurance database along with primary care International Classification of Disease 10th revision codes from the Canadian Forces Health Information System (CFHIS). All codes were arranged by body part, as per the Canadian Classification of Interventions nomenclature.

All suspected fractures identified by the BC data were validated by means of a manual chart review, whereas fracture codes from CFHIS were selected and validated using stratified random samples. Positive predictive values were calculated for different CFHIS code combinations and used to generate a bias-adjusted estimate of the total number of fractures in the CAF. Estimates of lost personnel days, direct and

indirect costs were calculated based on values from the CAF Cost Factors Manual and Canadian Institute of Health Information.

Results: We estimate 4,202 fracture cases among CAF Regular Force personnel during the study period. The highest rates of fracture occurred to the hand (450.4/65,000 person-years), foot (274.3/65,000py), and leg (245.4/65,000py). The most frequently reported mechanisms of injury were sports injuries (35.6% of cases), fall injuries (17.2% of cases) and motor vehicle accidents (10.5% of cases). Annually, these fractures resulted in an estimated 34,386 – 81,126 lost personnel days, $12.5 – $30.6 million in lost wages, and $5.6 million in hospital care.

Conclusion: Fractures represent a preventable source of operational, financial and physical strain to CAF health resources. Common risk factors will be discussed, along with the preventive applications of this work in informing targeted health interventions.

2B04: Trunk Muscle Activation Patterns are Different between Individuals With and Without Clinical Instability During a Complex Leg-lifting Exercise Task

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Introduction: Clinical instability (CI) assessments identify individuals who benefit from stability training[1]. In a highly controlled lifting task those with a CI modify trunk muscle activation to increase spinal stiffness[2]. However, other studies have shown individuals with CI also exhibit neuromuscular impairments that may reduce spinal stiffness[3]. The purpose of this study was to determine if those with CI would differ from those without during a novel complex leg lifting task.

Methodology: Thirty-two recovered low back injury (rLBI) participants (4-12 weeks post injury with minimal pain, disability) were recruited and classified as having a CI (CIG n=12) or not (NCIG N=20) based on a clinical assessment[1]. From a crook lying position participants performed a controlled, timed leg lifting task. Surface electromyograms (EMG) were digitized from 24 trunk muscle sites (12 abdominal and 12 back extensors) at 1000Hz, full-wave rectified, low-pass filtered (6 Hz), time normalized to 100% and amplitude normalized to maximum voluntary isometric contractions[2].

EMG ensemble-average waveforms were calculated for each muscle site and participant. Waveform features were captured using principal component (PC) analysis models. Mixed model ANCOVA (group and muscle; covariate: strength) were conducted on PC scores (a=0.05).

Results: There were 4 significant main effects for the abdominal muscles and none in the back extensors capturing that CIG differed from the NCIG in that the CIG exhibited: higher relative activity when both legs were off the bed; less responsiveness, lower relative muscle activation during the most demanding part of the task left leg lift; earlier activation of abdominals earlier in preparation to left leg lift; finally they had less ability to reduce trunk muscle activity in the period between left leg lift and left leg lower despite a reduction in task demands. These data show the CIG were less able to modify trunk muscle activation to changing external moment demands once both legs were off the bed. These patterns would increase spinal stiffness while also identifying deficits in the ability to modulate muscle activity.

Conclusion: The findings of this study are consistent with a dynamic

lifting task[2] where rLBI individuals classified with a CI exhibit muscle activation patterns consistent with less temporal responsiveness compared to those without. Future work is required to establish why those with CI utilize sustained muscle activity despite the potential metabolic demand, and if these patterns of sustained activation are useful in preventing future low back reinjuries.

3A01: Upper Extremity Neuromuscular Training Program on the shoulder function of military members with a rotator cuff tendinopathy: The lessons learned and the way ahead

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Introduction: Shoulder pain is a popular reason to consult a physician or physiotherapist today while continuing to be a challenge to rehabilitate, particularly with a military population. A rotator cuff tendinopathy (RCt), the most important source of shoulder pain, is one of the leading reasons for sick leave or a discharge from active military service. Research encourages the use of exercise prescription for the management of a RCt, however the ideal method of delivery, a group setting versus one-on-one, remains uncertain.

Methodology: This single-blind (evaluator) pilot randomized clinical trial compared the effect of two 6-week rehabilitation programs, a newly developed group-supervised neuromuscular training program (Exp) and one-on-one usual physiotherapy care (Ctl), on the pain and symptoms of Canadian Armed Forces (CAF) soldiers affected by a RCt. Thirty-one CAF soldiers with RCt were randomly assigned to the Exp or Ctl program. The primary outcome was the Disability of Arm, Hand and Shoulder (DASH) questionnaire. Secondary outcomes included level of pain, the Western Ontario Rotator Cuff (WORC) Index, shoulder strength, perceived level of change (GROC scale) and level of satisfaction of treatment. Both groups were assessed at baseline(T0) and at 6(T6) and 12(T12) weeks. Analysis included 2-way repeated measures of variance for intention-to-treat (ITT) and per-protocol analyses.

Results: No significant group (p ≥ 0.16) or group × time interactions (p ≥ 0.11) were found for either ITT or per-protocol analyses. A statistically significant time effect (p < 0.001) was observed for the DASH and WORC, showing that both groups improved over time.

Conclusion: Although challenging recruitment precluded statistically significant conclusions, our preliminary data demonstrates that both rehabilitation approaches derived similar benefits over time. This suggests that a group intervention for a RCt in a military setting has potential to be just as effective as a one-on-one approach for a military population and may contribute to a decrease in waitlist time for access to care. Moreover, this approach fits well with the military culture of promoting exercise and remaining physically active. Our research has also brought forth several lessons learned for the implementation of a group-supervised approach for military members in order to increase treatment adherence. Our recommendations include outlining realistic parameters for exercise prescription and specific patient goals, clearly explaining the benefit of each exercise and implementing comprehensive monitoring during the group program. Further investigations are warranted regarding the cost and clinical resource benefits of such a supervised group approach.

3A02: Measured Hearing Loss and Self-reported Hearing Problems among CAF Regular Force Personnel

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Introduction: Occupational noise is a common hazard for military personnel. Hearing conservation is an essential component of military population health, as hearing-related disorders can adversely affect communication abilities and effectiveness, operational readiness, and personal wellbeing.

In the Canadian Armed Forces, monitoring of electronic hearing test data and matched self-report questionnaires is ongoing. Analysis of these data generate the information necessary to develop targeted prevention approaches and support ongoing hearing conservation efforts.

The objectives of this study were to determine the prevalence of hearing loss among active Regular Force personnel and to assess the association between measured loss and perceived hearing problems.

Methodology: The most recent audiometric test results from a sample of 74,830 Regular Force personnel who underwent hearing tests from 2010-2017 were included in this analysis. Audiometric testing measures hearing thresholds (in decibels [dB]) for a range of sound frequencies (in kilohertz [kHz]).

For this study, hearing loss was characterized by an average hearing threshold ≥25dB in the worse ear in the speech frequency range (0.5, 1, 2, 4 kHz) and high frequency range (3, 4, 6, 8 kHz). Self-perceived hearing loss was assessed by the survey question "Do you have an existing hearing problem?" We examined hearing loss by sex, rank, age, and military command.

Results: Measured hearing loss was worse among males and greater in the high frequency range (M: 23.6%; F: 11.1%) than in the speech frequency range (M: 9.1%; F: 4.4%). Both speech and high frequency hearing loss increased with age. Neither speech frequency nor high frequency hearing loss differed substantially between Army, Navy, and Air.

NCMs had greater measured hearing loss than officers for speech (9.3% vs 5.6%) and high (22.6% vs 19.1%) frequencies.

Overall, 14.9% (M: 16.2%; F: 7.8%) of CAF personnel self-reported an existing hearing problem. Notably, only 69.0% of males and 56.4% of females with measured speech or high frequency loss self-reported an existing hearing problem.

Conclusion: In this first detailed analysis of CAF audiometric data, one in fifteen Regular Force personnel have measured speech frequency loss, and are at risk of diminished hearing of commands in noisy or operational environments. Furthermore, nearly a quarter of men and more than one in ten women have high frequency hearing loss, which will progress to the speech frequencies with continued unprotected exposure to noise and increasing age.

This presentation will culminate with a discussion of targeted prevention efforts, and risk mitigation among occupational sub-groups.

3A03: Hearing Fitness among CAF Regular Force Personnel: Measured hearing loss and the associated medical categories

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Introduction: Canadian Armed Forces Medical Standards dictate the minimum medical fitness required for military occupations. CAF personnel are categorized into medical categories for six factors, including hearing acuity. Hearing acuity is determined by audiometric testing and personnel are categorized into four hearing categories (HCATs) from H1 (no hearing loss) - H4 (severe hearing loss). Medical categories, including HCATs, are updated continually and maintained as part of personnel files in the Human Resources Management System (HRMS).

The aim of this study was to determine the agreement between measured hearing of a sample of Regular Force personnel and HRMS HCATs of all active Regular Force personnel.

Methodology: We used measured audiometric data from a large sample of Regular Force personnel who had their hearing tested at CAF clinics between 1 July 2013 and 1 July 2016 (n=39,153) and categorized each individual into "measured HCATs". We used administrative data from the HRMS Medical Categories Database to determine the proportion of all active Regular Force personnel in each HCAT as of 1 January 2017 (n=65,934).

Results: The proportion of personnel in measured HCATs compared to HRMS HCATs vary substantially. The vast majority of personnel have H1 (measured: 59.1%; HRMS: 81.3%) and H2 hearing (measured 30.2%; HRMS: 13.7%). More than twice as many personnel have moderate to severe measured hearing loss (H3 and H4) compared to HRMS (10.7% and 5.0%).

More than twice as many males have moderate to severe hearing loss compared to females (measured, M: 11.6%, F: 5.3%; HRMS, M: 5.5%, F: 2.4%).

The Royal Canadian Navy have the lowest proportion of normal hearing (H1) according to the measured data (RCN: 55.4%; RCAF: 61.1%; Army: 60.7%), yet H1 is nearly identical across commands in HRMS (RCN: 81.6%; RCAF: 82.3%; Army: 81.6%).

Conclusion: Our study is the first to compare two separate sources of hearing-related data to examine the hearing fitness of CAF personnel. We have demonstrated substantial differences in HCAT categorization with nearly 40% more personnel with normal hearing in the HRMS Medical Categories Database compared to measured hearing. This discrepancy in hearing fitness has operational implications because individuals' ability to perform optimally may be limited because of poorer measured hearing acuity than is indicated by the HRMS HCAT.

Future research will explore the typical lag in measured hearing loss triggering an official HRMS HCAT change and examine occupational sub-groups with disproportionate number of personnel with measured HCATs below their occupational requirement.

3A04: Epidemiology of Neck and Back Pain in the Canadian Armed Forces: A 4-year study of electronic medical record data

*Theriault, Francois, MSc; Hawes, Robert, MSc; Lu, Diane, MD, PhD

Department of National Defence

Introduction: Neck and back pain are a leading cause of clinical encounters, medical evacuations out of theatres of operations, and medical release from military service. However, tools to efficiently and accurately study these conditions in Canadian Armed Forces (CAF) personnel are lacking, and little is known about their distribution across the CAF. We developed and validated new research tools, which we then used to describe the epidemiology of past-year neck and back pain in the CAF Regular Force population.

Methodology: We accessed the electronic medical charts of 691 randomly-sampled Regular Force personnel. All charts were carefully reviewed to determine whether subjects had suffered from neck or back pain at any point in the 2016 calendar year. We then extracted all diagnostic codes entered in the electronic medical records of our 691 subjects, from 2012 onwards, and linked them over time to create various case-finding algorithms. Our final case-finding algorithm correctly identified 65% of patients with past-year neck or back pain, and 97% of pain-free patients.

We then applied our case-finding algorithm to large clinical and administrative databases, and estimated the prevalence of past-year neck and back pain in the entire Regular Force population, for each year from 2014 to 2017. We also used multivariate Poisson regression to compare past-year prevalence between sexes, age groups, rank categories, and military occupations. We used bias analysis methods to adjust for the algorithm's tendency to misclassify certain individuals.

Results: On January 1st, 2017, there were 65,979 personnel in the Regular Force, 23.2% (95% CI: 22.8-23.6%) of whom had suffered from clinically-significant neck or back pain at some point in the past year. The past-year prevalence of neck and back pain remained virtually unchanged from 2014 to 2017.

Female sex, older age groups, and NCM rank category were associated with significant increases in past-year prevalence (adjusted prevalence ratios: 1.36 to 2.97; p < 0.05). Unadjusted estimates of past-year pain prevalence ranged from 17.5% in engineers to 30.0% in administrative personnel; after adjusting for sex, age, and rank differences, prevalence was highest in health care personnel and lowest in radar operators.

Conclusion: We developed new research tools, and used them to provide the first description of neck and back pain epidemiology in CAF personnel. Our results have shown that these musculoskeletal disorders are highly prevalent, and that certain population sub-groups are at higher risk of experiencing clinically-significant pain. Our results could inform ongoing health promotion and injury prevention efforts.

3A05: Comprehensive Degradation Assessment of Laser Eye Protection use in the Canadian Forces

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Introduction: The shelf life and environmental degradation of in service laser eye protection was tested to determine their life cycle, and to ensure Canadian Forces members are adequately protected.

Methodology: Laser eye protection lenses were tested on a spectrophotometer to determine their optical density prior to the testing and at regular intervals during the environmental tests. The lenses were put under increased heat and an Arrhenius equation to determine shelf life. Lenses were placed in a ASTM G155-13 cycler to simulate solar exposure. They were exposed in a day night simulated cycle equivalent to an Ottawa radiant exposure. The average degradation was calculated from the averages of left and right lenses. Results were compared to radiant solar exposure in other environments, and to the manufacture's specifications.

Results: The optical density of the laser eye protection was found to have a shelf life in excess of 30 years, but optical density in the near infrared band degraded rapidly after 100 hours of solar exposure. The solar degradation was not seen in lenses that protected in the visible band.

Conclusion: The implications of this study showed that lenses that protect against most military lasers lose their protection at a more accelerated rate than expected. Thus the risk of laser overexposure, and potential for wye injury, increases with use of the lenses. We recommend that laser eye protection is exchanged after 100 hours of use in daylight, and new laser eye protection is tested prior to procurement.

4A03: Cervical Cancer Screening in the Canadian Armed Forces: An estimation of screening participation rates using the CF HERO surveillance system

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Introduction: Canadian women have a 1 in 152 chance of developing cervical cancer in their lifetime, and research shows that prevention through appropriate cancer screening can prevent 4 out of 5 of potential cases. The Canadian Task Force on Preventive Health Care recommends routine screening for women aged 25 to 69 every three years, with a minimum coverage target of ≥80% of the eligible population.

According to the 2013/14 Health and Lifestyle Information Survey, 89.5% of women within the Canadian Armed Forces (CAF) self-reported having a Pap test in the past three years. However, studies demonstrate a widespread tendency for women to over-report their cervical cancer screening histories. Furthermore, screening coverage rates across Canada appear to be declining in recent years. No data on programmatic participation rates by CAF members, using either clinical or administrative data sources, has been synthesized to date.

Objective: To estimate cervical cancer screening rates using data extracted from the CAF Health Evaluations and Reporting Outcomes (HERO) system.

Methodology: The Master Patient Index (MPI) was used to identify all actively serving Regular Force females between January 1st 2015 and December 31st 2017. Scanned documents containing Papanicolaou test results were extracted from the CF Health Information System (CFHIS). Crude and age standardized screening coverage rates were calculated for all eligible CAF members, and analyses were stratified by both command and rank. STATA 13.0 was used for all analyses.

Results: The study period yielded over 28,000 person-years of data. The mid-point screening rate over this period was 64.9%, and was highest in the 30-39 and 40-49 age groups. Variations in rates were ob-

served by rank and command, with significantly higher screening rates observed in Royal Canadian Navy members (p<0.01) and non-commissioned members (NCM's) (p<0.05). Overall, cervical cancer screening rates showed a pronounced and steadily declining trend over time for all groups across the study period.

Conclusion: Cervical cancer screening rates amongst CAF members are currently below recommended guidelines and appear to be declining. These trends mirror those observed more widely in the general Canadian population, and may be a consequence of recent changes to guidelines for both cervical cancer and HPV screening. Implications of these trends on the future reproductive health of female CAF members are discussed.

5A01: Damage Control Resuscitation: Enhancing survivability of Canadian Armed Forces members on the battlefield

*Taylor, Allan, MD; *Forestier, Colleen, MD*

Canadian Armed Forces

Introduction: Significant changes to military prehospital care have occurred in the past two decades, resulting in profound improvements in battlefield wound survivability statistics. The two most important changes have been the development of the Tactical Combat Casualty Care (TCCC) program, and the development of Damage Control Resuscitation (DCR). TCCC refers to the immediate aid rendered by medical and non-medical personnel to the wounded, while DCR is a term used to describe an approach that includes TCCC but also incorporates far forward specialized care in preparation for possible surgical interventions. DCR principles were developed based on research done on battlefield injury cases from past conflicts, such as the Vietnam War as well as the more recent conflicts in Afghanistan and Iraq. Designed to improve survivability, DCR is a spectrum of medical interventions beginning at the point of wounding and lasting until patient has been handed over to definitive medical care. DCR concepts and treatment modalities have been designed to address the major causes of mortality including hypoxia, acidosis and coagulopathy and encourage interventions to be pushed farther forward on the battlefield. This has prompted new research into areas such as whole blood, component therapy and buddy transfusion. New doctrine, developed by NATO and other international allies, guides the incorporation of DCR into medical capabilities and sets out timelines for patients receiving this specialized care, although standards and capabilities differ from nation to nation.

Methodology: A literature search was conducted in order to find relevant publications which influenced the development of DCR policy. A review was also conducted of international doctrine that will influence Canada's future capability development. Other allied nations were surveyed to determine their current approach to the provision of DCR. Finally the Canadian Forces Medical Group approach to DCR was reviewed.

Results: Numerous publications related to DCR were found and analysed to produce a summary of the evidence leading to this capability. A review of various policies makes it clear that any nation that wishes to interoperate with others and satisfy NATO commitments must have a DCR capability.

Conclusion: In order to enhance battlefield survivability and interoperate with our allies, the CAF will have to continue to incorporate DCR into its medical capabilities as well as develop new approaches in a resource constrained environment.

5A04: Still CAREN: Still caring

Lambert, Anne-Marie, BSc[1]; Bridgewater, Courtney, MSc[2]; Holly, Janet, MSc[2]

[1]Department of National Defence; [2]The Ottawa Hospital

Brief Description: The Computer Assisted Rehabilitation Environment systems (CAREN) purchased by the CAF in 2009 are coming to the end of their lifecycle. The two systems have been used in a partnership with The Glenrose Hospital and The Ottawa Hospital Rehabilitation Center since 2011. Due to logistical issues and different types of military populations variations in CAREN use exist between the two sites. The program in Ottawa has a strong clinical emphasis with constant knowledge translation between health care providers involved in the patient care.

One might believe that such an expensive piece of equipment is used to optimize and enhance rehabilitation care for our high level tactical athlete. However, treatment of complex cases in the virtual reality (VR) environment provides insight for the therapist to develop more tailored home-based exercise programs (e.g. post-concussive syndrome/chronic pain).

A neurological treatment approach is required for both mild traumatic brain injury and chronic pain patients. Virtual reality allows the opportunity to test different sensory stimulus and evaluate patient responses. Changes in motor or cognitive function, production of patient symptoms, or sympathetic autonomic activation symptoms are used to identify sensory triggers evoked. The identified symptom triggers can be treated in the CAREN, in the clinic and at home with exercises. Patients learn to modulate their nervous system and how to pace in high stimulus environments.

Clinical Outcomes: Within session outcome measures are selected to assess the VR based intervention, including treatment time, recovery time, simulator sickness symptoms, and dizziness. Recovery time is the self-reported time to return to baseline symptom following the treatment session. Dizziness is rated on a 10-point Likert scale and symptoms of nausea, oculomotor, and disorientation is rated using the Simulator Sickness Questionnaire (SSQ).

Patient Population: Active Service Members, Members Transitioning to Civilian Life

Conclusion: Virtual Reality provides novel assessment and treatment opportunities. The CAREN system does provide unique features that cannot always be replicated in the clinic, but the lessons learned from the CAREN are also be generalized to clinical care and to other VR technologies for the provision of home treatment programs.

5B03: Developing Resilient Platelets for Transfusions Associated with Trauma Induced Coagulopathy

*Chan, Vivienne, PhD; Sarkari, Morteza, BSc (Student); Sunderland, Rachel, BSc (Student); *Kastrup, Christian, PhD*

University of British Columbia

Introduction: Platelets are an integral part of primary hemostasis and platelet transfusions are used to reduce bleeding during severe hemorrhage, including during Tactical Combat Casualty Care (TCCC). However, transfusions of blood components are insufficient to stop the most severe cases of hemorrhage. Uncontrolled bleeding may be further complicated by platelet dysfunction, such as during trau-

ma-induced coagulopathy and acidosis. In a step towards increasing the efficacy of platelet transfusions during acute severe bleeding, we asked whether the natural coagulability of transfusable platelets could be maintained during coagulopathy by loading them with liposomal thrombin.

Methodology: Thrombin was encapsulated into nanoliposomes and delivered to platelets isolated from fresh whole blood. Platelet coagulability was determined by measuring platelet activation, clot initiation, clot strength, and clot contraction.

Results: Encapsulating thrombin into nanoliposomes shielded the enzymatic activity of thrombin and caused minimal background platelet activation. Platelets loaded with liposomal thrombin (LT-PLTs) were more sensitive to collagen activation, and led to faster clot initiation, enhanced clot strength, and enhanced clot contraction. This increased coagulability of LT-PLTs persisted during acidosis, in the presence of antiplatelet drugs, hemophilia A plasma, and plasma isolated from patients with trauma-induced coagulopathy.

Conclusion: Platelet coagulability was enhanced by the delivery of liposomal thrombin, even in conditions where platelets normally become dysfunctional. This study is a first step towards engineering transfusable platelets that have increased efficacy for treating severe hemorrhage, and may have future applications in delivering other proteins to platelets and other cells or tissues.

5B04: Tranexamic Acid Applied Topically with Self-propelling Particles Stops Bleeding

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[1]University of British Columbia; [2]University of Washington; [3]Centre for Drug Research and Development

Introduction: Bleeding is the leading cause of preventable death following battlefield trauma. Tranexamic acid (TXA) is a potent and clinically used inhibitor of fibrinolysis which reduces bleeding, and is typically given intravenously following trauma; this precludes its use immediately following injury and in early phases of Tactical Combat Casualty Care (TCCC). Recent trials have shown that early administration of TXA increases its benefits to survival. Applying TXA topically could expedite its use, but topically applied hemostatic agents are rapidly flushed from wound sites by high blood flow. A formulation of TXA which can be applied at the point of injury, penetrate blood flow, and achieve primary hemostasis, could reduce mortality in TCCC. Here we show that by formulating TXA with previously developed self-propelling particles (SPP-TXA), it can be rapidly applied to the wound site, stop bleeding, and achieve therapeutic plasma concentrations within minutes of administration.

Methodology: To measure if SPP-TXA can inhibit fibrinolysis, an *in vitro* model of normal and hyperfibrinolytic clot lysis was used. To test if SPP-TXA could reduce bleeding *in vivo,* tails of mice were amputated, SPP-TXA was applied, and blood loss was measured. To test if SPP-TXA could improve survival following massive non-compressible junctional hemorrhage, a swine femoral artery model of junctional hemorrhage was used. Animals received 5 mm femoral arteriotomies followed by wound packing with gauze loaded with SPP-TXA with no subsequent compression. Over three hours, plasma concentrations of TXA, blood loss, and survival were measured.

Results: In our *in vitro* model of clot lysis, SPP-TXA significantly increased clot retention compared to non-propelling formulations in all conditions. Mice receiving SPP-TXA had lost significantly less blood following tail transection compared to mice who received TXA intravenously or as a topically applied solution. Sixty seven percent of pigs who received gauze loaded with SPP-TXA survived to three hours, which appeared higher than pigs receiving Combat Gauze in a previous published study. One hour post-injury, pigs that received SPP-TXA gauze had therapeutic plasma concentrations of TXA.

Conclusion: SPP-TXA was effective at inhibiting fibrinolysis and stopping bleeding in several models. Gauze loaded with SPP-TXA appeared similarly effective compared to current clinical standards, but additionally delivered a therapeutic dose of TXA. SPP-TXA could be very useful for achieving forming robust clots in situations in TCCC and prolonged field care. Additional studies are required to test SPP-TXA's safety and efficacy at treating bleeding over longer periods of time.

Poster Presentations

P115: Factors Impacting Care Provision for Physiatry Services in the Canadian Forces

*Gupta, Gaurav, MD[1,2]; Besemann, Markus, MD[1]; Paquet-Proulx, Emilie, DEC[1]

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Brief Description: For patients suffering with chronic pain there are numerous barriers to finding care. Given the nature of chronic pain, patients are often cared for longitudinally. In the current system this often saturates the ability of a given provider or clinic to continually accept new patients. In Canada this often results in long waitlists of between 6 months to 4 years, or entirely closed intakes. At the Canadian Forces Health Services Centre in Ottawa the current waitlist is approximately 9 months for a new patient to be seen and 4 months for patients to be seen in follow up. While expanding the knowledge of primary care practitioners, and also training new chronic pain specialists will help alleviate this burden, this process is longitudinal and will not address current needs.

In the interim, we sought to determine what factors impact the length of clinical assessments and associated administration such as report generation.

Outcomes: We have been prospectively collecting data on demographics, clinical issues, and clerical work associated with patient interactions. A Bayesian analysis will applied to the available data.

Patient Population: We expect approximately unique 200 records of follow ups and/or new consultations over a 3 month period to be available for an analysis to determine which factors are impacting the length of assessment and to what degree.

Conclusion: At this time data collection is ongoing, but will be complete within 60 days. Therefore no conclusions can currently been drawn. However, identifying these factors will allow us to identify, adopt and test the appropriate mitigation strategies to increase the efficiency of the clinical encounter. The long-term goal would be to decrease the time for required for a given clinical assessment, while still maintaining high quality, compassionate care for our military members suffering with chronic pain.

P116: Spinal Rehabilitation for Performance at Canadian Forces Health Services Centre Atlantic: Is it the missing piece of the rehabilitation puzzle in low back pain management?

*Glover, Selena, MSc; Trudel, Daniel, MSc; Godsell, Pauline, BSc; Ashman, Jason, BSc

Department of National Defence

Brief Description: The low back rehabilitation program, or Back Class, in Canadian Forces Health Services (CF H Svcs C (A)) has been an integral part of evidence-based care for low back pain (LBP) over the last 11 years. It continues to evolve to keep in line with current international best practice guidelines, which recommend exercise and education as a first line treatment for LBP[1-4]. A large proportion of members who are referred to the class are either inactive, deconditioned, and/ or not in their regular exercise routine for fear of re-injuring themselves. One of the main feedback points at the end of the program is that the 6 weeks is too short a timeline. A big challenge noted by these members is to maintain their exercise routine and progress to more challenging loads without ongoing structure and support.

The Spinal Rehabilitation for Performance (SR4P) program was introduced at CF H Svcs C (A) approximately one year ago. It was originally designed to address a gap in functionality by providing specificity to training, improving performance and ultimately increasing the operational readiness of service members. SR4P has provided the much needed next step for a proportion of members with LBP, while increasing collaboration between Personnel Support Programs and Canadian Forces Health Services staff.

This project aims to highlight initial findings of SR4P roll-out at CFB Halifax and 12 Wing Shearwater. It will outline the inclusion/ exclusion criteria of the Back Class and SR4P, and how the programs compliment each other in the rehabilitation continuum, within the biopsychosocial framework.

Clinical Outcomes: 1) Proportion of referrals to the Back Class and SR4P at CF H Svcs C (A); 2) Changes in functional scores; 3) Completion percentages of each of the programs; 4) Qualitative summary of reasons for non-completion of program.

Patient Population: Ill and injured CAF military personnel.

Conclusion: The insights gained though this descriptive study will highlight successes and challenges in the implementation of a turnkey collaborative program during its pilot phase of national rollout within the largest multi-lodger operational base in Canada. It will provide the groundwork for designing an exploratory study to look more formally at effects on recidivism rates of musculoskeletal conditions upon completion of R4P program.

P117: The Energy Cost of Various Infantry Tasks

*Mandic, Iva, PhD[1]; Ahmed, Mavra, PhD[1]; L'Abbe, Mary, PhD[1]; Goodman, Len, PhD[1, 2]; Jacobs, Ira, DrMedSc[1]

[1]University of Toronto; [2]Department of National Defence

Introduction: In this descriptive study, the metabolic cost of a standardized battery of infantry tasks was quantified using direct measurements of oxygen uptake in order to aid in future estimations of energy expenditure in military personnel in the field when such measurement techniques cannot be done.

Methodology: The energy costs of 46 infantry tasks covering a range of light, moderate and heavy work rates were measured using indirect calorimetry in 21 Canadian Armed Forces (CAF) members (15 male, 6 female). Mean Metabolic Equivalents (METs) were calculated for each infantry activity and compared with similar activities reported in the *Compendium of Physical Activities* and in published studies conducted in military personnel elsewhere.

Results: When comparing the calculated MET values to published data, it was often difficult to effectively match the military tasks completed in this study to the activities described in the *Compendium of Physical Activities*. Many of the infantry tasks (20%) were not found in the *Compendium* and similar activities often significantly underestimated the energy cost of the military tasks. This underestimation is likely attributable to the clothing weight discrepancy found between military personnel and the general population (participants wore clothing/equipment weighing 13.5±1.4 kg). In contrast, when comparing the infantry tasks in the current investigation with similar activities conducted in military personnel wearing similar clothing, no general underestimation was apparent.

Conclusion: This report has generated a compilation of the energy costs of common infantry tasks which can be used to estimate energy expenditure during field operations or training in the field.

P118: An Assessment of Indoor Air Quality aboard HMCS Winnipeg

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Department of National Defence

Introduction: The Directorate of Naval Platform Systems mandated the Deployable Health Hazard Assessment Team to conduct a series of indoor air quality assessments (IAQAs) aboard Halifax Class Ships of the Royal Canadian Navy. The first assessment was conducted aboard Her Majesty's Canadian Ship Winnipeg while sailing from Tokyo, Japan to Pearl Harbor, USA from 15 to 28 July 2017. The objective of this IAQA was to identify potential hazards that could impact the health of the crewmembers and confirm compliance with applicable standards.

Methodology: Particulate matter with diameters of 2.5 microns or less (PM2.5), 10 microns or less (PM10), inhalable dust, respirable dust, carbon monoxide, carbon dioxide, total volatile organic compounds, relative humidity and temperature were measured using direct reading instruments at 132 locations with high humidity, high crew density and/or machinery. Direct reading instruments were also used to assess the level of JP-5 and diesel fuel vapor, hydrogen sulfide, nitrogen dioxide (NO_2) and sulfur dioxide at specific locations. Detected high concentrations of airborne contaminants were then confirmed through analytical sampling. Surface and total airborne mould sampling was conducted at locations susceptible to mould growth.

Results: NO_2 concentrations in the Cruise Diesel Engine Enclosure (CDEE) and the Forward Auxiliary Machinery Room were above the Threshold Limit Values – Time Weighted Average exposure limits provided by the American Conference of Governmental Industrial Hygienists. Recommendations for further investigation and correc-

tive action were provided. Airborne mould concentrations above background levels were limited to the Solid Waste Handling Plant, the Ops AC Plant and the Recovery Assist, Secure and Traverse Equipment Room. Temperatures aboard the ship for all occupied compartments were within the recommended range of 18 to 29°C, except in the Aft Auxiliary Machinery Room, the Forward Engine Room, the Aft Engine Room, the CDEE and the Paint Locker. The Forward and Aft AC Plants had primary airflows below their design values. A majority of inspected ducts, in particular square ducts, showed significant accumulation of dust.

Conclusion: In conclusion, the majority of the compartments had air quality parameters within the respective guidelines and standards, with the exception of a few locations. The results of this IAQA are to be added to other planned IAQAs in order to obtain a robust set of data on the air quality aboard Halifax Class Ships. Ultimately, the resulting recommendations of engineering and administrative controls along with appropriate personnel protective equipment will protect crewmembers from airborne health hazards.

P119: Musculoskeletal Injury Recurrence Rates in Active Duty Personnel from the Atlantic and Quebec Regions

*Trudel, Dan, MSc; Thibault, Isabelle, BSc; Stefanov, Bonnie, MSc; Debouter, Kelly, MSc; Guimond, Renaud, MPT; Villeneuve, Kristie, MPT; Godsell, Pauline, BSc

Department of National Defence

Brief Description: Musculoskeletal dysfunctions are consistently the most common injuries reported by Canadian Armed Forces personnel. Current data from the Health and Lifestyle Information Survey 2013/2014 demonstrates that 51.7% of Regular Force personnel self-reported acute (19.4%) and/or repetitive strain injuries (32.3%) serious enough to limit their normal activities. This percentage is significantly higher than 43.1% reported in 2008/2009 (acute 20.5%, repetitive strain injuries 22.6%).

It is believed that a significant proportion of these injuries could potentially be exacerbations of previous injuries. If true, this supposition could point to key issues in the recidivism rates post-musculoskeletal treatment and could be an area to focus on to increase efficiency and reduce overall costs.

The aim of this analysis is to provide updated statistics on recurrence rates of musculoskeletal injuries in an active duty military population. Last year a poster was presented on rates from three bases in the Atlantic region. It was shown that 30.4% of all injuries in the Atlantic region were recurrences of previous injuries with the highest rate being for low back pain, which had an overall recurrence rate of 40.5%. This year has expanded collection to include the Quebec region as well and will report on data from seven bases covering all elements. A comparison in the Atlantic region to last year's data will also be completed.

Clinical Outcomes: A self-report questionnaire will be utilized to determine if the current injury for which the patient is presenting to Physiotherapy is a new event or a recurrence of a previous injury. Data will be stratified by base and body part injured and will report injury and recurrence numbers as well as injuries and recurrences expressed as a percentage of the total.

Patient Population: The questionnaire will be given to all patients presenting to the Physiotherapy section for a new assessment from

Sept 2017 to Sept 2018. This analysis will include all bases from the Atlantic and Quebec regions (Gagetown, Halifax, Shearwater, Greenwood, St. Jean, Valcartier, and Bagotville) and will cover all elements.

Conclusion: As this analysis is ongoing we do not have conclusions at this time.

P120: The Impact of Instituting Rehabilitation for Performance (R4P) at Canadian Forces Health Services Centre Atlantic: Preliminary trends and findings

*Trudel, Dan, MSc; Ashman, Jason, BKin; *Fagan, Eric, MHSc; Hannaford, Adam, BSc; Greig, Lyndal, BSc; Rowe, Peter, MSc

Department of National Defence

Brief Description: Musculoskeletal (MSK) dysfunctions are consistently the most common injuries reported by Canadian Armed Forces (CAF) personnel. Current data from the Health and Lifestyle Information Survey 2013/2014 demonstrates that 51.7% of Regular Force personnel self-reported acute (19.4%) and/or repetitive strain injuries (32.3%) serious enough to limit their normal activities. This percentage is significantly higher than 43.1% reported in 2008/2009 (acute 20.5%, repetitive strain injuries 22.6%). Last year we reported that 30.4% of all injuries assessed by Physiotherapy departments in the Atlantic region were recurrences of previous injuries, pointing to major issues in the recidivism rates post-MSK treatment. According to the 2013-2014 HLIS, patients reported that post Physiotherapy treatment they were only functioning at 85% of full capacity. While this is a significant improvement over pre-treatment values of 58.7%, it demonstrates that there is a need to bridge the gap between post-treatment and full functioning in our active military population.

The Rehabilitation for Performance (R4P) programs are designed to address this gap in functionality by providing specificity to training, improving performance and ultimately increasing the operational readiness of service members. It is purposely designed to provide standardized, evidenced based, region-specific, phasic and graduated exercise programming of sufficient duration and load to target central nervous system activation and motor learning; causing physiological change at the involved tissues through 4 phases: Phase 1 – Reset – Low Activation to induce 'alarm'; Phase 2 – Reinforce – Medium Activation to increase endurance; and Phase 3/4 – Reload – Moderate/High Activation to increase strength, power, and function. It is hypothesized that this training could have a positive effect on recurrence rates of MSK injuries.

We aim to present preliminary recurrence trends following the inclusion of R4P at CFB Halifax and 12 Wing Shearwater.

Clinical Outcomes: Injury profiles and recurrence rates have been collected in the Atlantic region since March 2017 and R4P was fully implemented in Halifax in Oct 2017 giving us 7 months of data pre-R4P. We will compare recurrence rates pre and post R4P implementation to determine if there are any preliminary trends in injury recurrence.

Patient Population: Ill and injured CAF military personnel.

Conclusion: R4P is an integral program required to complete the continuum from initial assessment of an injury to return to full function,

while increasing collaboration between Personnel Support Programs and Canadian Forces Health Services staff. Data is still being collected and therefore is not ready to be included in this abstract.

P121: The CAF Heat Related Illness Surveillance System: Development and validation of a mixed active and passive disease surveillance system

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Department of National Defence

Introduction: Heat-related illnesses (HRI) include the range of adverse physiological reactions that result from exposure to excessive environmental heat. The risk of HRI increases when an individual performs intense activity in the heat without adequate rest or hydration is not acclimatized to the environmental heat they are experiencing, the body is unable to expel excess heat, or when early symptoms of HRI go ignored or unrecognized.

HRIs pose a particular risk to Canadian Armed Forces (CAF) members as Canada's temperate climate is not conducive to heat acclimatization, and military activities entail strenuous physical activity, timed physical fitness testing, and the wearing of personal protective equipment. To support current CAF HRI prevention health policy, DFHP has developed the Heat-Related Illness Surveillance System (HRISS). The HRISS aims to catalogue all HRI events and gather complete, timely and actionable data that can be used to inform targeted interventions for the reduction of HRI in the CAF, their associated long-term health consequences, and their operational burden.

The objectives of the HRISS are to identify and quantify HRI events in the CAF and to identify common risk factors which may have contributed to the event.

The objective of this presentation is to increase awareness of the HRISS among leaders in Canadian military health and engage stakeholders in improving the user's experience and data collection.

Methodology: Passive disease surveillance methods were employed with the HRISS Event Reporting Form. Designed to capture key data pertaining to the individual along with environmental and organizational risk factors which have contributed to the HRI, the electronic form allows for facilitated data analysis. Active disease surveillance methods were employed with CFHIS and Blue Cross databases for the identification of HRI events by using clinical diagnosis and health insurance data. This allows for the identification of missing reports and for follow-up with the attending physicians.

Results: The HRISS is ready for its pilot trial in the summer of 2018. HRI rates and risk factors will be available for analysis by service element, age, sex, and rank.

Current clinical and administrative data are highly indicative of positive events with a 90.9% positive predictive value (95% CI, 97.3% – 84.5 %).

Conclusion: The HRISS combines sentinel surveillance forms and electronic health data in a mixed surveillance system which will be piloted in 2018. This significantly advances health surveillance in the CAF and will inform future occupational health hazard surveillance projects such as cold injuries, and toxic metal exposure.

P122: Blending Modern Neuroscience Education and Therapeutic Exercise in the Management of Non-specific Low Back Pain: Clinical review of collected data over a three year time frame at 42 Health Services Center (Gagetown)

*Boorman, Glen, BSc; Mullin, Laura Lee, BSc; Debouter, Kelly, MClSc

Department of National Defence

Brief Description: Non-specific low back pain (NSLBP) accounts for a large percentage of the low back pain population and has tremendous personal and socioeconomic impacts such as long term sick leave, lower quality of life and high socio-economic costs (1). Physiotherapy for NSLBP is often limited to a biomedical model with emphasis on either input mechanisms (peripheral elements like joints and muscles) or output mechanisms (motor control) without accounting for underlying pain mechanisms and present understanding of modern pain neuroscience (1). There is compelling evidence that an educational strategy addressing neurophysiology and neurobiology of pain can have a positive effect on pain related disability, catastrophization and physical performance (2). Exercise for NSLBP is a widely utilized intervention however there is no consensus with regards to the best type of exercise and the effect systematic reviews is not robust and inconclusive. Individuals who believe their pain is a sign of serious pathology or injury may become fearful and avoidant of physical activity that they presume worsens their presentation (3). Pain related fear is one of the strongest modifiable presentations of disability in low back pain. The purpose of this initiative is: 1) to blend therapeutic neuroscience education with exercise prescription which addressed cognitive and kinesiophobic aspects in an effort to reduce these domains of fear which would then; 2) enhance the therapeutic benefits of exercise treatments.

Clinical Outcomes: a) We utilized the StarT back screening tool as well as the Tampa Scale of kinesiophobia to capture pre-program and post program fear related cognitions.

b) We utilized the Oswestry low back pain disability questionnaire as a means to track perceived disability pre and post program

c) We utilized the straight leg raise, finger to floor and Vo2Max estimate (Balke treadmill test or Rockport 1 mile test) as objective measures to track movement and exertional related fear pre and post program.

Patient Population: CAF members with NSLBP presenting for Physiotherapy care at 42 Canadian Forces Health Services Center.

Conclusion: We collected data over a three year period and noted what appears to be a clear trend towards enhanced overall outcomes in the challenging subset of the low back pain population. Blending therapeutic neuroscience education and re-assurance guided therapeutic exercise is often challenging for the clinician tasked with treating patients with NSLBP. Our program addresses this challenge and it appears to be a viable program which could be utilized CAF wide to enhance the therapeutic benefits of exercise programs.

P123: Development of Broad-spectrum Antiviral Drugs

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Introduction: In contrast to antibiotics, antiviral drugs are highly spe-

cific, rendering them largely useless in the face of outbreaks arising from unknown or newly emerging pathogens. Access to a broad-spectrum antiviral agent could permit prophylactic usage to quell the spread of the disease in a situation where CAF members are exposed to an unknown viral pathogen. This would provide breathing space for the roll-out of more traditional antiviral drugs designed for that pathogen. The most promising step in viral infection for broad-spectrum action is the initial viral attachment. Here we will present progress in designing and synthesizing new drugs inspired by the natural compound EGCG.

Methodology: This is a chemistry-driven project. Using EGCG as a starting point, we have designed and synthesized a series of unnatural compounds that mimic its action, but with greater potency (sub-micromolar IC50 values) and broader spectrum activity. This involved identifying several general chemical scaffolds, decorating them with the groups necessary for recognizing the viral coat proteins, and testing these compounds against a range of different viruses. While promising, these compounds are predicted to undergo rapid metabolism when used in vivo, so now we are redesigning their structure to build in better stability, while also further improving their potency.

Results: We have found that labile ester linkages can be replaced with more stable ketone functionalities. We are also in the process of replacing metabolically unstable gallate groups with isosteres that should mimic their action, but not undergo rapid metabolism. Results from the latest compounds will be presented.

Conclusion: This is a recently funded project (March 2018), so this poster will be a progress report. To date we have identified key features that provide broad-spectrum antiviral activity through inhibition of viral attachment. In the future, we will optimize these structures to obtain compounds with the proper drug-like properties that will allow them to be tested in animals, and eventually in humans. Successful compounds could be developed as valuable prophylactic drugs in the field for the CAF when there is risk of exposure to viral pathogens.

P127: The Correction of Hypoxemia in Healthy Subjects and Chronic Obstructive Pulmonary Disease Patients Wearing a Gas Mask with Automated Oxygen Titration (FREEO2)

*Bourassa, Stéphane, PhD (Student)[1,2,3]; Lellouche, François, PhD, MD[1,3]; Bouchard, Pierre-Alexande, [1,3]

[1]Université Laval; [2]Université de Montréal; [3]Centre de Recherche Institut de cardiologie et pneumologie de Québec

Introduction: Hypoxemia may occur in subjects wearing a gas mask due to exposure to different toxic substances or to a pre-existing respiratory insufficiency. Oxygen management may become a major logistical issue during medical extractions. This study assessed the automated oxygen titration with FreeO2 to maintain stable oxygenation in healthy subjects with induced hypoxemia or in subjects with chronic obstructive pulmonary disease (COPD) while wearing a gas mask.

Methodology: *In healthy subjects,* hypoxemia was induced with an air/nitrogen mixture leading to 14% FiO2 of inspired gas. The design of the study was a randomized crossover evaluation of the following conditions: induced hypoxemia without a mask; induced hypoxemia with a mask; corrected hypoxemia with a mask (with FreeO2, SpO2 target was set at 96%). *In COPD patients*, the design of the study was a randomized comparison of three conditions: unmasked, A-filtered cartridge (masked), and B-filtered cartridge (masked). The two filtered

cartridges had their own distinct respiratory resistance. None of the COPD patients were hypoxemic at baseline (when breathing ambient air without a mask). Our measurements were on the Oxygen flowrate, SpO2 and heart rate which were continuously recorded with the FreeO2 device. Capillary blood gases were collected at the end of each studied condition.

Results: We included 14 healthy subjects and 9 COPD patients. In healthy subjects, at inclusion, SpO2 when breathing ambient air without a mask was 97.3±1.0%. During induced hypoxemia, mean SpO2 measurements with and without a mask were 89.8±5.2% and 88.6±6.0% respectively. After hypoxemia correction, mean SpO2 was 95.1±2.9% and mean oxygen flowrate was 1.34±0.67L/min. None of the COPD patients received long-term oxygen therapy. SpO2 without a mask was 93.1±2.6%. Most of these patients did not receive oxygen at baseline, one arrived hypoxemic after walking to the research laboratory and received oxygen therapy to re-saturate. Mean SpO2 with a mask was 94.1±2.4% (cartridge A) and 93.8±2.3% (cartridge B). In most COPD patients, oxygen administration when wearing a mask was minimal (no oxygen or less than 0.5L/min). Free-O2 delivered on average 0.47±0.98 L/min of oxygen flow rate with the filtered cartridge A compared to 0.08±0.98 L/min with the filtered cartridge B.

Conclusion: This study demonstrates that induced hypoxemia was correctable using a gas mask, and a prescribed SpO2 target was continuously maintained when combining a gas mask and the FreeO2 system.

P135: What Gets Measured Gets Managed – An Amyotrophic Lateral Sclerosis Case Study

*Godsell, Pauline, BSc[1]; Campbell, Amanda, BSc[1]; Parker, Kim, MSc[2]; Smith, Cher, BSc[2]; Swift , Alex, MD[1]; Robichaud , Lynne, BSc[1]; King, David, MSc[1]; Mountford, Cathy, MD[1]; Trudel, Dan, MSc[1]; Besemann, Markus, MD[1]

[1]Department of National Defence; [2]Nova Scotia Rehabilitation Centre

Brief Description: Canadian Armed Forces (CAF) members diagnosed with amyotrophic lateral sclerosis (ALS) expect the same professionalism and intensity from their hybrid civilian-military multidisciplinary rehabilitation team as they have experienced throughout their military training and career. ALS is a relentlessly progressive neurodegenerative disease characterized by motor neuron loss resulting in weakness, wasting, twitching, cramps, stiffness, loss of dexterity, activity limitation and eventual death. The evidence base for the management of ALS, given the poor prognosis and rapid disease course, is weak. As such, it is vital to identify and follow the best expert recommendations available while also documenting and presenting cases such as this one in order to inform best clinical practices within our Canadian community.

This poster will illustrate our team's comprehensive journey to date, highlighting the challenges and accomplishments related to the delivery of quality, patient-centered care based on the World Health Organization framework for health and disability, the International Classification of Functioning, Disability and Health.

Clinical Outcomes: Impairment:

Muscle weakness measured by limb muscle strength using hand-held dynamometry (HHD).

Ventilatory muscle strength using vital capacity measures.

Activity limitation:

Changes in function using the ALS Functional Rating Scale (ALSFRS-R) and the Community Balance and Mobility Scale (CB&M).

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 maintain participation in meaningful activities. The insights gained through this CAF member's ALS journey could be applied to select patients in civilian populations, with similar clinical profiles, and in other countries with similar demographics and resources.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

1A02: The Soldier On Program: Identifying the right time for participation following an injury or illness (2 of 5)

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Introduction: As part of their commitment to providing support to ill/injured military personnel, the Canadian Armed Forces (CAF) has developed a comprehensive approach in their multi-faceted model of treatment and care following a traumatic injury. One integral initiative is the Soldier On program, which supports both actively serving military personnel and veterans in overcoming their physical and/or mental health injury through the promotion of physical activity and sport.

Methodology: In order to assess the role of Soldier On in helping to meet the needs of injured members, an exploratory qualitative study, based on semi-structured, in-person interviews (n=75), was conducted with program participants at events across Canada. The interviews were recorded and transcribed, and thematic analysis of the data was conducted using the qualitative software program MAXQDA.

Results: Analysis of the findings to date does suggest that there are key periods in time following an injury or illness where participation in a Soldier On event would likely help to maximize the impact and benefit of the experience, such as prior to a medical release. Alternately, the data highlights the potential risk of involvement at certain points where participation may not be especially positive or advantageous, such as the acute injury phase. Early knowledge of the program is noted to increase the likelihood of capturing participants at an appropriate point. Strategies to increase outreach and awareness will be discussed.

Conclusion: Overall, the Soldier On program has been found to play a significant role in the recovery, reintegration, and rehabilitation of actively serving CAF members and veterans. Results of this study will further help to provide insight into identifying the best point in time following an illness or injury to capture an individual for participation in the program.

1A04: Qualitative Study Results: Well-being of spouses of ill or injured military members and Veterans (4 of 5)

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Department of National Defence

Introduction: Military members experience multiple demands and risks associated with the military lifestyle. These include the risk of becoming mentally ill or physically injured, which can have life-long implications. Moreover, following members' illness or injury, families must confront the unexpected needs of ill or injured members and associated responsibilities while coping with the stress of living a military lifestyle. In some cases, the illness or injury can contribute to spousal psychological distress. This study was conducted to gain insight on the experiences of spouses of ill or injured Canadian Armed Forces (CAF) members and recent veterans.

Methodology: Using a qualitative approach, semi-structured interviews were conducted with a sample of 22 ill or injured members or veterans who had either recently been medically released or were in the process of medically releasing from the CAF. The semi-structured interviews were carried out either in person at several locations across Canada or over the telephone. During the interview, spouses of releasing members and veterans were asked to describe their current physical and mental health, their caregiving experiences, and the impact of their military spouse's illness or injury on the quality of their spousal relationship and on their psychological well-being.

Results: Interview transcripts were analyzed using Grounded Theory. Spouses of ill or injured members and veterans described a range of stressors related to the health of their military spouse and their transition experience. One key stressor was the need for caregiving across a variety of domains (e.g., help with tasks, managing schedules, medical treatments). Spouses believed that the illness or injury contributed to relationship problems and decreased relationship quality. Moreover, spouses described how stressors related to the illness or injury as well as challenges related to the transition to civilian life negatively impacted their overall psychological well-being and quality of life.

Conclusion: Findings from this qualitative study highlight some of the lasting impacts of illnesses or injuries of military members on families, including caregiver burden, decreased spousal well-being, and an impaired quality of spousal relationship. By gaining a greater understanding of the experiences of families of ill or injured members and veterans, especially in the context of the transition to civilian life, the military organization can ensure that support services and programs are consistent with the needs of military families.

1B02: Prevalence of Prescription Opioid use Amongst Canadian Armed Forces Members in 2016: A claims data analysis

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Introduction: Prescription opioid medications play an important role in the treatment of pain. Opioid use can introduce harm, and concerns have been raised about the appropriateness of opioid prescribing practices in Canada. Given recent developments, many health care authorities in Canada have implemented prescription monitoring programs (PMPs) for opioids. The Canadian Forces Health Services (CFHS) has collected and analyzed preliminary data on opioid dispensing patterns, but requires more detailed information in order to develop a suitable PMP to mitigate prescription opioid risks for its personnel. This study was conducted to determine the prevalence of prescription opioid use in the Canadian Armed Forces (CAF) in 2016.

Methodology: Prescription claims records contained within the Me-

davie Blue Cross database were analyzed for Regular Force CAF members between the ages of 18-60 years who were dispensed an opioid in 2016. Relevant claims were identified using codes for opioids specified in the World Health Organization's Anatomical Therapeutic Classification System. Measures of prescription use were then calculated using methodology described in a recent Ontario report, and included the number and characteristics of individuals dispensed opioids, the types of dosage forms dispensed, and opioid dosing in milligrams of morphine or equivalent (MEQ).

Results: A total of 27,084 opioid transactions were identified among 11,690 personnel. One in six CAF members were dispensed an opioid with 81% of users being male and 56% of users being junior non-commissioned members. Among 10,887 individuals dispensed an opioid for pain, almost all received an immediate-release (IR) formulation (99%, n=10,829), with long-acting products dispensed less frequently (4%, n=463). Codeine combination products were the most frequently dispensed IR opioid for pain (59%, n=6400) followed by hydromorphone (19%, n= 2076). The majority of dispensed opioids (84%, n=20,686) had MEQs in the lowest risk category. A total of 11,273 new user prescriptions (86%) contained less than 50 MEQ compared to 320 prescriptions (3%) that were for more than 90 MEQ. The median days' supply of IR opioids dispensed for new users was five.

Conclusion: This study provides an overview of prescription opioid use in Regular Force CAF personnel in 2016. While the results do not allow for evaluation of associated health outcomes, the scope and magnitude of opioid usage patterns within the CAF are now better understood. Additional analysis should be undertaken to compare prescription opioid usage against established practice standards and evidence-based clinical practice guidelines.

4A05: Battle Injury, Non-battle Injury and Disease among Canadian Armed Forces Personnel in Afghanistan, 2004-2012: A novel program of operational and population health research

Hawes, Robert, PhD (Cand); Thériault, François, PhD (Cand); Lu, Diane, MD, PhD

Department of National Defence

Introduction: The Canadian Armed Forces (CAF) combat mission in Afghanistan (2004-2011) presented a substantial challenge to the health and readiness of our nation's military, leaving many lessons to be learned from nearly a decade of conflict. The ubiquity of modern communications permitted, for the first time, the digital capture of health events, battle injuries and total service days for each CAF soldier, sailor and aviator in a theatre of war. However, the impact of battle injury, non-battle injury and disease on the CAF combat mission in Afghanistan has not been previously described, nor have the long-term sequelae of war on the operational and medical readiness of the Canadian military.

Methodology: Three primary sources of medical data from the Afghanistan combat missions will be combined: a) Directorate of Health Services Operations (DHSO) database, b) U.S. Department of Defence Trauma Registry (DoDTR), and c) Defence Research and Development Canada (DRDC) Casualty and Protective Equipment Analysis (CASPEAN) database. Medical and occupational outcomes (i.e. duty limitations, hospitalizations, aeromedical evacuations and in-theatre mortality) will be presented by demographic and occupational factors, seasonality, mission phase and the mechanism and severity of injury. Data from the CAF Health, Evaluations and Reporting Outcomes (HERO) system will then be used to evaluate the 15-year sequelae of Afghanistan-related medical events on health behaviours, medical release, and in-service mortality of CAF personnel. Multilevel survival models will be applied to understand the relationship between demographic, occupational and operational factors and the likelihood of experiencing a combat-related health outcome.

Results: This program of research represents the most comprehensive investigation into the injury, disease and mortality outcomes of CAF personnel who served in Afghanistan. A depiction of the epidemiology and morbidity of in situ disease and injury will a) provide empirical support for calculating casualty rates and estimates of force strength in future missions, b) inform operational planning and the deployment of health resources, and c) guide the development of ballistic and non-ballistic injury prevention initiatives.

Conclusion: Collectively, these studies will provide much-needed support for institutional policy, health resource allocation and preventive medicine during combat operations. The subsequent discussion will focus on the security and privacy applications of the work, and comparisons to previous research findings from allied nations in Afghanistan.

4B04: Project ERIC: Exposure based rehabilitation in immersive contexts – A novel high-tech way to personalize exposure-based treatment of PTSD

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Introduction: This project offers a novel way to provide exposure in a virtual world. Novel VR exposure based therapies are increasingly relying on immersion and gamification. Typical head mounted display systems allow for a immersive world that allow subjects to explore sensations, feelings, memories and interact with the elements that remind them of distant past. We developed a novel VR based interactive systems that is built on layers of immersiveness in a virtual world. The project is exposure based and focuses on immersion and guided imagery with personal pictures.

Methodology: Sometimes people cannot get to an imaginary state properly and if they can the therapist cannot exactly see what they see so the patient has to describe both his feelings and the imaginary vision he or she experiences. This has impact on the state of immersion or can break the spell. In close corporation with the Military Mental Health Care Unit the Royal Netherlands Army Simulation Centre developed a Proof-of-Concept using VR. The subject can be immersed in a self-chosen safe and virtual world. In this world he will be seated to a table that holds a series of control elements (radio, tokens to reduce fear, visual and verbal 3D-contact with therapist through a virtual TV). The subject is tasked to work on a picture book, organizing a series of self-chosen pictures and supply them with cognitive and affective stamps. The therapists will help ordering and rating the cognitions to the (hot-spot) pictures and will follow eyes gaze with tracker. The subject will learn to tolerate traumatic affect, provide cognitive association to the hot spots and self-control exposure. Expose will be step-wise offered while relaxation exercised can be entertained in the virtual world. Several elements are available to practice control while increasing exposure, e.g. battle breathing, or relaxation exercises. Text- to speech allows to captivate connotations to the pictures. Sessions are protocolized to allow subjects to control exposure in the

immersive virtual contact.

Results: This work-in-progress is aimed to optimize personalization for the subject with PTSD. The feedback on the PoC so far confirms our expectations.

Conclusion: First results are promising but further development is necessary. Future thoughts are the implementation of biofeedback, controller-free interaction, event logging and more. During this further development the Military Mental Health Care Unit and the Dutch Research Institute for Applied Science will be involved for validation. Results in veterans with PTSD will be shared during the presentation.

5A02: Canadian Armed Forces Health Indicators Report 2018, Part I: Objectives, methods and results from chronic disease and musculoskeletal injury

Hawes, Robert, PhD (Cand); Thériault, François, PhD (Cand); Diane, Lu, MD, PhD

Department of National Defence

Introduction: The Canadian Armed Forces (CAF) Surgeon General's Integrated Health Strategy (2017) highlighted the need for evidence-based health indicators to manage, monitor and improve the health profile of Canada's military personnel. In support of these efforts, the Directorate of Force Health Protection (DFHP) has developed a series of health indicators to address the need for timely, robust and actionable information. The CAF Health Indicators Report 2018 provides more than fifty health indices arranged into five categories including a) demographics, b) medical readiness, c) health resource use, d) chronic and musculoskeletal conditions, and e) health behaviours. The first part of this presentation will focus on the overarching objectives and methodological devices used in the development of the CAF Health Indicators Report, and communicate the results of our health indicators related to chronic disease and musculoskeletal injury.

Methodology: The CAF Health, Evaluations and Reporting Outcomes (HERO) system integrates individual and population-level data from across CAF including clinical and mental health diagnoses, pharmacy, radiology, laboratory, audiometry, physiotherapy, dental and health measures data. Demographic and occupational-related databases are added to facilitate the computation of health statistics over time and across CAF commands. Incident and prevalent cases of chronic disease and injury are computed using time-series Poisson regression, and informed by appraisals of disease burden and duration from expert opinion and the research literature. Estimates are age- and sex-standardized to the CAF 2017 mid-year population, where applicable.

Results: In 2017, there were 65,964 Regular Force personnel employed in the CAF (85.3% male, 14.7% female) with 68.7% of personnel less than 40 years of age. Past-year prevalence rates of chronic conditions varied by age, sex and CAF organizations, and include hypertension (6.5% overall), asthma (4.7%), diabetes (0.9%), carpal tunnel syndrome (1.8%), sleep apnea (4.4%) and tinnitus (6.8%). Diagnoses for musculoskeletal conditions were also common, including low back pain (12.4%) and neck pain (2.4%).

Conclusion: The development of the CAF Health Indicators Report enables timely information to CAF commands, clinic managers and health professionals. Well-conceptualized health indicators encourage evidence-based health policy decisions, and allow for the evaluation of population health interventions over time.

5A03: Canadian Armed Forces Health Indicators Report 2018, Part II: Medical readiness, behavioural health and health resource use

Hawes, Robert, PhD (Cand); Thériault, François, PhD (Cand); Lu, Diane, MD, PhD

Department of National Defence

Introduction: Operational excellence is a central component of the Quadruple Aim framework adopted by the Surgeon General's Integrated Health Strategy (2017). Improvements to force posture and readiness tracking are key to the development and maintenance of Canada's military. The Canadian Armed Forces (CAF) Health Indicators Report 2018 includes measures of medical readiness at the CAF command and sub-command level to inform senior leadership, health care professionals and health promotion activities. The second part of this presentation will describe indices related to medical readiness, mental and behavioural health status, and the use of health services among CAF Regular Force personnel.

Methodology: The Directorate of Force Health Protection (DFHP) has developed a robust population health surveillance system by routinely extracting and linking data from CAF health and administrative databases. Key health indicators were then developed to measure health behaviours (e.g. predicted tobacco use and obesity status), mental and physical disorders (e.g. depressive episodes, alcohol use disorders), health service utilization (e.g. personnel referred for specialist care), and medical readiness (e.g. personnel with an assigned medical category of G3O3 or above). Time-series Poisson regression was then used to estimate the past-year prevalence of these indicators for CAF Regular Force personnel.

Results: Among CAF Regular Force personnel enlisted in 2017, we estimated population prevalence rates for a variety of health conditions including current tobacco use (21.3%), obesity (30.6%) and moderate or high risk of dental caries (20.1%). Past-year prevalence of diagnoses for depressive disorders were higher among personnel in the Canadian Army (5.2%) than in the Royal Canadian Navy (5.0%) and Royal Canadian Air Force (4.3%), whereas alcohol disorders were more prevalent among Navy personnel (2.3%) than Army (1.7%) or Air Force (1.2%). The twelve-month prevalence of referral for physiotherapy services was 4.8% for upper body injuries, 6.4% for trunk and spine conditions and 7.9% for lower body injuries, while specialist referrals for audiology (3.1%), orthopaedics (2.9%) and dermatology (2.0%) were also common. Medical readiness (defined as G101-G303) was positive for 84.7% of CAF Regular Force personnel, temporarily affected for 11.8% and permanently impacted for 3.6% of the population.

Conclusion: Triangulation with other health information, including health surveys and administrative databases is critical in understanding the determinants and outcomes of health conditions on the medical readiness of CAF personnel. The presentation will conclude with time allotted for audience feedback and discussion regarding the CAF Health Indicators Report.

6A01: Risk Propensity and Sexual Behaviours in Canadian Armed Forces Recruits

McCuaig Edge, Heather, PhD; Beswick-Escanlar, Vincent, MD

Department of National Defence

Introduction: Recent reports indicating that rates of sexually trans-

mitted infections (STIs) among young male Canadian Armed Forces (CAF) members are higher than civilians prompt a need to understand CAF members' sexual behaviours, and the factors that could influence them. While CAF members could be more prone to engage in certain types of risk (e.g., recreational risk) as expected with their career choice, they may also be more prone to engage in behaviours that could compromise their health and safety. This study explored the relationship between recreational and health and safety risk propensity, and sexual behaviours among CAF recruits.

Methodology: Participants included 8,686 Regular Force recruits (85% male; 78% non-commissioned member recruits; mostly aged 20 to 24 years) who completed a baseline health survey between 2013 and 2015. Recruits reported their number of sexual partners and frequency of condom use in the previous year, and their history of an STI diagnosis. They also completed measures of recreational risk propensity (e.g., likelihood of taking a skydiving class, going camping in the wilderness) and health and safety risk propensity (e.g., likelihood of drinking heavily at a social function, riding a motorcycle without wearing a helmet).

Results: Among sexually active recruits, 40% had more than one sexual partner in the previous year, 46% who were not in exclusive relationships always used a condom, and 6% reported ever having received an STI diagnosis. Preliminary hierarchical regressions controlling for age, sex, and rank suggested that number of sexual partners was positively associated with greater recreational and health and safety risk propensity. Less frequent condom use was positively associated with health and safety risk propensity but negatively associated with recreational risk propensity. Preliminary logistic regressions suggested that the odds of having received an STI diagnosis increased with health and safety risk propensity, but was not associated with recreational risk propensity.

Conclusion: Recruits with a higher propensity to engage in health and safety risks were more likely to report having engaged in risky sexual behaviours. Although openness to recreational risk is unsurprising and can be desirable in military members, health and safety risk propensity can lead to health compromising behaviours, which could in turn impair fitness for operations. By better understanding how risk propensity can contribute to unsafe sexual practices, the CAF could develop screening tools to identify segments of the recruit population that could benefit from targeted interventions and health promotion programming, such as screening and intensive behavioural counselling.

6A02: Sexuality and Intimacy Rehabilitation for the Military Population: A Case Series

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Introduction: Managing intimate and sexual relationships is an important issue within the military due to the high likelihood of experiencing sexual functioning and intimacy problems following trauma. As many as 80% of service members with post-traumatic stress disorder (PTSD) and more than 60% of those with traumatic brain injury (TBI) report clinically-relevant sexual difficulties. Amputation and genitourinary trauma often leads to sex and intimacy problems due to pain, positioning issues, testosterone deficiency, self-image and body image challenges, and lowered self-esteem. Although men and women indicate that a satisfying sexual relationship is important to overall quality of life, clinicians hesitate to initiate discussions of intimate relationships with patients.

The Occupational Therapy (OT) Department at Walter Reed National Military Medical Center (WRNMMC) has developed a sex and intimacy intervention that addresses aspects of education and treatment. The purpose of this case series was to evaluate the efficacy of OT sessions in restoring sexual health and intimacy.

Methodology: For this case series, participants of the OT Sexuality and Intimacy (OTSI) intervention program consented to a retrospective chart review of their medical records and a semi-structured interview. All interviews were audiotaped, transcribed and sequentially analyzed to identify efficacy, outcomes, and reproducibility of the OTSI program.

Results: This case series consists of three subjects, two male and one female. At the time of treatment, they were all married and ranged in age from 27 to 47 years old. They each completed between 4 to 15 OTSI treatment sessions.

The impact of the intervention on the patients' quality of sexual activity and intimate social participation, overall quality of life, and satisfaction with their role as a sexual and intimate partner was paramount to their overall wellbeing. Analysis of interviews revealed distinct themes, including: a change in the definition and understanding of sexual activity, adapting sex routine to accommodate pain/injury, improved communication of sexual goals and desires, importance of addressing body image challenges, increased focus on quality time, communication, role identity with intimate partner, an altered understanding of intimacy and sexual activity, and education regarding emotional regulation.

Conclusion: This case series raises awareness of the social, emotional, and behavioral needs of traumatically injured service members working to reengage in sexual and intimate participation. It also supports the importance of implementing a sex and intimacy OT intervention program and serves as a pilot for future prospective investigations regarding the full impact of addressing this activity of daily living.

6B01: A Longitudinal Qualitative Research Study of Well-being for Canadian Armed Forces Members during the Military-to-civilian Transition: A study protocol

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Introduction: The purpose of this longitudinal qualitative study is to better understand the mental health and well-being of CAF members/Veterans, the determinants of mental health and well-being, and the effectiveness of supports during the peri-release period of MCT.

Methodology: This study will be informed by the interpretive/constructivist paradigm, which assumes that experiences and meanings are socially constructed through day-to-day interactions.

At the outset of the project, participants will complete a sociodemographic questionnaire. In-depth, semi-structured interviews will be conducted 0 to 6 months prior to the end of the participant's service

with the CAF, approximately 6 to 9 months after service ends, and again another 6 to 9 months after that. After each of the interviews, participants will also be asked to complete the World Health Organization Quality of Life survey (WHOQoL-Bref).

Recruitment will be stratified to create as robust and representative of the CAF population as possible. Our objective is to recruit approximately 100 CAF members for this research project with a realistic representation of French and English speaking CAF Members (approximately 75% English and 25% French), of males (85%) and females (15%), of officers (20%) and non-commissioned members (80%), and across service branches. Our sample will also aim to include 15 reservists with Class C experiences.

Results: Data analysis and data collection will proceed simultaneously in this study. Each interview will be transcribed verbatim and coded guided by grounded theory methodology developed by Strauss and Corbin, using MAXQDA, a qualitative analysis software program. Interviews will be subjected to open, axial, and selective coding to organize the data, establish common themes within the interviews, and theorize the data.

Sociodemographic variables will be subjected to a descriptive analysis. The qualitative variables will be described using percentages, and the quantitative variables using means and standard deviations.

The WHOQOL-Bref scores will be calculated using the methods described in the reference literature (WHO, 1996). We will compare the scores at Times T1, T2 and T3 using Student's t-test and the Wilcoxon matched-pairs test. We will develop a mixed linear model to account for the correlations between the data on the same individual from Times T1, T2 and T3. The independent variables will be the time and the type of release.

Conclusion: This longitudinal qualitative study on the mental health and well-being of military Veterans during MCT will make an important contribution to advancing the research base around the Canadian experience and the determinants which influence it.

6B03: The Canadian Armed Forces Health Survey: What do we need know about it?

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Introduction: The Health and Lifestyle Information Survey (HLIS) was a population-based health survey conducted by the Department of National Defence-Canadian Armed Forces (DND-CAF) every four to five years, last administered in 2013-2014. In 2019, Statistics Canada (StatCan) will be conducting the Canadian Armed Forces Health Survey (CAFHS), modeled after the HLIS, in order to obtain estimates at the Base/Wing level to inform local programs and initiatives. The objectives of this cross-sectional survey are: 1. To collect information on the prevalence of a wide variety of health conditions and to monitor the health status of DND-CAF personnel, 2. To use this information in the development and evaluation of policies and programs aimed at sustaining a healthy and deployable force.

Methodology: In order to identify priority issues for interventions aimed at individual garrison level, 33,000 Regular Force and 4,000 Reserve Force members will be sampled for CAFHS. This voluntary survey will be the first StatCan electronic health questionnaire completed by DND-CAF. To avoid seasonal bias, collection will be done in two three-

month waves beginning January 2019 and April 2019. Qualitative testing in April 2018 involved the administration of 21 cognitive interviews to recruited test participants at three bases.

Results: The majority of questions for CAFHS were taken from existing StatCan health surveys and from HLIS 2013-2014. Questionnaire content was revised from HLIS to improve the efficiency of the survey, and to optimize the quality of information obtained with input from DND-CAF stakeholders, including those working in health promotion, mental health, oral health, and occupational health. To reduce respondent burden and improve response rates, survey questions were preferentially removed to shorten self-completion time to approximately 45 minutes. The major content changes related to the mental health, physical activity, injury and military physical activity sections including the addition of new sections examining sleep, sexual behaviours and social support.

Conclusion: The CAFHS will be the first DND-CAF electronic health survey administered by StatCan. Given its large sampling size, it will provide important information at the Base/Wing level allowing for targeted local program initiatives. This will guide the development and evaluation of policies and programs aimed at sustaining a healthy and readily deployable force in support of the Strong Secure and Engaged DND-CAF Policy.

6B05: Brain Bootcamp: An integrated behavioral health intervention for military members with reduced executive cognitive functioning

Jones, Chelsea, MSc[1,2]; Pike, Ashley, PhD[2]; Brémault-Phillips, Suzette, PhD[2]

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Introduction: Canadian Armed Forces (CAF) service members experience higher rates of mild traumatic brain injury (mTBI) and psychosocial risk factors such as mental health diagnoses, sleep disturbances, alcohol consumption, and post-concussion symptoms than Canadian civilians. A common symptom of mTBI and more severe traumatic brain injuries (TBI) is impairment of executive cognitive functioning (ECF). ECF can also be negatively impacted by the aforementioned psychosocial factors which may exist independently or in tandem with a mTBI/TBI. Associated challenges ECF can significantly compromise the performance, engagement, and deployability of CAF service members. To address challenges with ECF, a CAF Occupational Therapist created and delivered Brain Bootcamp; an integrated behavioral health intervention for CAF service members who sustained an mTBI or TBI. While anecdotal reviews of the program were favourable, its impact on ECF in individuals with mTBI/TBI and/or mental health diagnoses, was yet to be determined. This study aimed to determine if Brain Bootcamp improves cognitive performance, reduces mTBI/TBI-related symptoms, and increases external aid utilization in CAF service members who have reduced ECF.

Methodology: A secondary analysis was conducted of clinical outcomes collected from 55 participants who participated in the Brain Bootcamp program from 2013 to 2018. Measures used to determine change prior to and following engaging in the program included the Montreal Cognitive Assessment (MoCA), Rivermead Post-Concussion Symptom Questionnaire (RPQ), an External Aids Utilization Survey (EAUS), and Participant Program Evaluation. Paired sample t-tests, two-way mixed ANOVA, and a chi-square test of independence were utilized to analyse data.

Results: Statistically significant changes pre- and post-interven-

tion were observed, including improved cognitive performance, reduced self-reported mTBI/TBI symptoms, and increased external aid utilization. Comorbid mTBI/TBI and mental health conditions were noted in 60.5% of the participants. The time since injury was not a factor in the outcome measure scores pre and post intervention. Participants with a moderate or severe TBI were observed to have the most drastic decrease in perception of mTBI/TBI related symptoms post-intervention.

Conclusion: Integral to engagement in daily tasks, interpersonal relationships, and professional activities, reduced ECF can compromise effectiveness and increase risk to CAF service members. Conversely, improvements in ECF can benefit CAF service members, their families, military units, and whole of the organization. Widespread delivery of Brain Bootcamp by Occupational Therapists as part of an interdisciplinary ECF management plan for SMs with mTBI/TBIs, mental health, and various other conditions may be warranted; further research is indicated.

Poster Presentations

P129: The CMOP-E Model: A bridge between military and veteran well-being strategies

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Introduction: Supporting the wellbeing and health of serving members, Veterans and their families is a priority for both the Canadian Armed Forces (CAF) and Veterans Affairs Canada (VAC). Attentive to the WHO definition of health as "a state of complete physical, mental and social well-being," each organization has developed holistic well-being strategies. Most notably, these include CAF's 2017 "Total Health and Wellness Strategy" (inclusive of the emotional, familial, intellectual, physical, spiritual and social well-being domains), and VAC's 2016 "A Well-Being Construct for Veterans' Policy, Programming and Research" (inclusive of domains of employment or other meaningful activity, finances, health, life skills and preparedness, social integration, housing and physical environment and cultural and social environment). While the initiatives are independently comprehensive, identification of a theoretical model that might align with and provide a crosswalk between both strategies may be helpful, particularly given the current emphasis on the military journey and support for serving members and veterans across the life course and transitions. The objective of this project was to identify a theoretical model aligned with both military and veteran-centric priorities that might act as a crosswalk between the strategies, and inform practice and policy of both organizations.

Methodology: A literature review, consultations with international experts and key stakeholders, and critical analysis of identified theoretical models was conducted. In keeping with the domains included in CAF and VAC well-being strategies, it was determined that a bio-psychosocial-spiritual model would be most appropriate.

Results: Of the bio-psychosocial-spiritual models isolated in the literature, the Canadian Model of Occupational Performance and Engagement (CMOP-E) (Polatajko, Townsend & Craik, 2007) was found to offer a framework for holistically approaching wellbeing across the military life course. Aligned with VAC and CAF strategic initiatives, the CMOP-E includes key elements inherent in both strat-

egies and can act as a crosswalk between them. It offers a framework by which to consider multiple intersecting elements associated with activities related to wellbeing, be it prevention, promotion, or recovery along the life course.

Conclusion: The CMOP-E, its constructs and bio-psychosocial-spiritual approach align well with the well-being and total health and wellness constructs presented by VAC and CAF. As a model, the CMOP-E offers a potential means by which to align the vision of both organizations and bring greater coherence to their joint mandates, while respecting their distinct priorities, practices and policies across the military journey.

P130: The Spiritual Well-being Domain: Isolating outcome indicators

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Introduction: The spiritual domain is one of several domains of the Total Health and Wellness Strategy. Outcome indicators associated with spiritual and religious (S/R) wellbeing are needed to better understand the S/R health and wellness of serving members and their families. While indicators have been identified both within the general and military populations, there is yet to be consensus regarding S/R indicators to use with specific populations or at various periods of the life course. Determination of common S/R indicators among serving members, veterans and their families would make it possible to demonstrate their wellbeing in this domain, as well as S/R resources that might facilitate wellbeing and resilience.

Methodology: A literature review and consultations with international experts was conducted to isolate outcome indicators associated with the S/R domain of well-being.

Results: While no universally accepted measurement framework was identified, several authors isolated S/R outcome indicators that apply to well-being and wellness. These indicators applied to physical, social, cultural, and other human dimensions (cognitive, behavioural, volitional); most indicators related to the impact of S/R beliefs and practices on personal, relational, mental and social health and life. S/R outcome indicators most frequently noted included: 1. Positive *relationships* with self, others, creation, and the Sacred, 2. *Morals, core beliefs and values*, 3. A sense of freedom, *agency*, will, intrinsic motivation, 4. *Growth*, 5. Values- and ethics-based *behaviours*, 6. One's *worldview* or orienting system, 7. *Meaning and purpose*, 8. *Spiritual struggle and coping*, 9. *Knowledge*, learning, 10. Striving toward one's *potential*, 11. Individual and communal experience, *ritual, S/R practices* (compassion, gratitude, forgiveness), 12. *Hope*, 13. Respect for the *diversity of beliefs*.

Conclusion: Numerous S/R outcome indicators that apply to well-being and wellness were identified through a review of the literature, each of which may be considered along a continuum (e.g., optimal to suboptimal). Further validation of S/R outcome indicators is yet needed. Identification of S/R outcome indicators would be beneficial in helping serving members, veterans, families and service providers identify their wellness and well-being at any point across the military journey in the S/R domain. Isolation of S/R outcome indicators can help inform the policy and practice of both the Canadian Armed Forces and Veterans Affairs Canada as they make efforts to support the total health and well-being of those who serve and have served.

P131: Using Machine Learning to Investigate Sympathetic Activation of the Autonomic Nervous System during the Treatment of Mild Traumatic Brain Injury, Chronic Pain, and Post-traumatic Stress Disorder Study: Background and implementation

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[1]The Ottawa Hospital Rehabilitation Centre; [2]Carleton University; [3]The Ottawa Hospital Research Institute; [4]Department of National Defense

Introduction: The Ottawa Hospital Rehabilitation Centre (TOHRC) Virtual Reality lab treats military and civilian patients suffering from a complex medical triad of traumatic brain injury, chronic pain, and post-traumatic stress disorder. Over half of rehabilitation patients experience one or more of these complex medical conditions, often associated with intractable symptoms which do not respond to traditional treatment options, and impairing their ability to function effectively at work and in the community. Using a Computer Assisted Rehabilitation Environment (CAREN) this research will collect and consolidate a series of non-invasive whole-body biological measurements from patients during immersive therapy sessions in the CAREN Virtual Reality facility. High-performance computing and machine learning will be used to develop and deploy real-time estimators of SAANS. These systems will allow clinicians to create individualized treatment plans for patients, thereby maximizing rehabilitation benefits and avoiding costly setbacks in patient treatment.

Methodology: For 6 months data will be collected on all patients that consent to the study, and come to the CAREN for treatment. This will include a convenience sample of civilian, currently serving members and veteran participants.

The data collected will include movement data (VICON motion capture and ground reaction forces), heart rate, breathing rate, and a measure of blood pressure variability. Treating clinicians will record their observations of patient signs and symptoms, as well as changes to movement patterns - which will be the gold standard estimator of SAANS.

The data will be analyzed using bulk retrospective data analytics, using SOCIP resources.

Results: The data collection solutions for this project will be presented. These solutions include categorizing clinical observations, creating a solution for real-time observation recording, synchronizing data collection from electrocardiogram, breathing bands, pressure pulse wave, and the CAREN (both movement data and what is occurring on screen).

Conclusion: The completion of this project will further our understanding of how to treat patients with complex rehabilitation needs resistant to current treatment methodologies. The goal is to deploy a real-time estimate of patient SAANS, to tailor treatment exposure for all patient groups, within a VR environment or in the traditional clinical setting.

P137: Canadian Armed Forces and Veteran Data Available at Statistics Canada

*Hohban, Lori; *Hoover, Melanie

Statistics Canada

Brief Description: Statistics Canada has a number of contemporary population-based health surveys and administrative data sources available to researchers. In addition, information about upcoming military surveys and how to access military data at Statistics Canada (StatCan) will be provided.

Existing StatCan studies:

1. the Canadian Forces Cancer and Mortality Study (CFCAMS), an administrative data linkage that examines causes of death and cancer incidence in a cohort of individuals with a history of military service in Canada's Regular Force;

2. the Life After Service Survey (LASS), formerly known as the Survey on Transition to Civilian Life (STCL), which is a national longitudinal survey that collects information on the transition from military to civilian life, general health and well-being, and other related information. A retrospective tax linkage study has also been conducted with this cohort as a complementary administrative data study;

3. the Canadian Armed Forces Transition and Well-being Survey (CAFTWS) which was a study to understand the transition to civilian life and its impact on the health of released military members;

4. the Survey on Sexual Misconduct in the Canadian Armed Forces (SSMCAF) which collected information about the prevalence and nature of inappropriate sexual behaviour in the military and the reporting of inappropriate sexual behaviour to authorities;

5. the Canadian Forces Mental Health Survey (CFMHS) which collected information about the mental health status and the need for mental health services in the military;

6. and the Canadian Community Health Survey – Canadian Forces Supplement (CCHS-CF) which collected information on mental and physical health and well-being and the factors that affect their health and use of health care services.

Outcomes: These studies focus on a variety of topics such as but not limited to, mental and physical health, deployment experiences, general well-being, transition to civilian life, and access to physical and mental health resources of military personnel. These studies have differing methodologies, target populations, and objectives which will be displayed in the poster session.

Patient Population: The target populations for these studies include regular and reservist Canadian Armed Forces members, Veterans, and their families.

Conclusion: The poster session will include brief descriptions of existing and upcoming studies and where future research is heading to meet stakeholder data requirements.

P141: Sleep Stage Disruptions in Persons with Mild Traumatic Brain Injury

*Mollayeva, Tatyana, MD, PhD[1,2]; Colantonio, Angela, PhD[1,2]; Cassidy, David, PhD[1]; Vernich, Lee, MPH[1]; Moineddin, Rahim, PhD[1]; Shapiro, Colin M., PhD[1,3]

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Introduction: Polysomnography (PSG) studies of patients with mild traumatic brain injury (mTBI) have documented changes in sleep stage

distribution relative to healthy controls; results from four earlier studies focused on mTBI were not consistent, and the mechanisms underlying changes in sleep architecture in mTBI are not understood fully. We investigated sleep architecture and the deviation from the norm in an average person with an established diagnosis of mTBI and ongoing symptoms post-injury. Using published values for normal sleep stage distribution we sought to 1) assess the magnitude of changes in sleep stages in a sample of mTBI patients compared with sex-and age-specific normative values; 2) examine associations between factors known to modify sleep stage distribution and changes in mTBI sleep stages; and 3) describe sex differences, if any, in changes in sleep stages compared with population norms.

Methodology: We conducted comprehensive clinical and neuroimaging examinations of forty participants diagnosed with mTBI (mean age 47.54±11.30 years; 56% males) and all participants underwent one full-night PSG. We used the 2012 American Academy of Sleep Medicine recommendations for recording, scoring, and summarizing sleep stages. Our primary outcomes of interest were percentage of time spent in N1, N2, N3 (stages 3 and 4, regarded as N3 by new scoring criteria, were investigated separately), and REM sleep. We compared participants' sleep stage data with normative data stratified by age and sex to yield z-scores for deviations from population norms. We employed stepwise multiple regression analyses to determine factors associated with deviations in sleep stage duration from normative age- and sex-matched values.

Results: Mean duration of nocturnal wakefulness was higher and consolidated sleep stage N2 and REM were lower in mTBI patients than the norm ($p<.0001$, $p=.018$; $p=.010$, respectively); observed changes were present in both males and females. In multivariable regression analysis, several covariates accounted for the variance in the relative changes in sleep stage duration. The magnitude of the relative changes in sleep stage duration were associated with symptoms and signs experiences by persons, including insomnia, cognitive, emotional, circulatory and respiratory systems symptoms, and those falling within nervous system.

Conclusion: Sleep is a tightly regulated process of sleep stages, disruption of which has deleterious consequences. Future studies are needed to contribute to the understanding of broad neural networks that interact to produce sleep stages in healthy and mTBI persons.

VETERANS

HEALTH POLICY

Podium Presentations

4C04: Pre- and Post-release Income of Regular Force Veterans: Life After Service Studies 2016

*MacLean, Mary Beth, MA; VanTil, Linda, MA; Poirier, Alain, OCAD; McKinnon, Kristofer

Veterans Affairs Canada

Introduction: This study of Veterans income is part of the Life After Service Studies program of research aimed at understanding the transition from military to civilian life. This report describes income trends pre- and post- release, for Regular Force Veterans and their families.

Methodology: Statistics Canada produced aggregate tables from a linkage of records on military releases, Veterans Affairs Canada client status and tax files for 42,645 Regular Force Veterans released from 1998 to 2014. Veteran income (before tax) was examined for the pre-release year, the average 3 year period after release and up to 16 years post-release.

Results: Average income in the year prior to release was $65,470, increased in the release year, and then declined the year after to $62,040. Post-release income reached pre-release income after three years post release and continued to increase.

The average decline in income from the pre-release year to the first three years post release for the Regular Force cohort was 3%. However, female and medically released Veterans experienced much larger declines; 21% and 19% respectively.

Of the 15% of Veteran families that experienced low income at least one year post release, the majority were not VAC clients. However, higher rates of low income were experienced by Veterans released as recruits (38%), involuntarily (37%) or with less than 2 years of service (37%).

The vast majority (93%) of the Veterans had labour-market earnings post release. The highest average earnings were among those how had been in medical occupations and the lowest were among those who had been in the combat arms prior to release. The largest employer was the public service, accounting for over one-third of Veterans. Changing employers was common as less than half of Veterans had the same employer during the first three years post-release.

Veterans who completed the VAC Rehabilitation program replaced only 50% of their labour-market earnings. Younger Veterans with disability who had much lower labour-market earnings replacement than their non-injured counterparts. Many with low disability assessments had poor earnings recovery and many with high disability assessments had high earnings recovery.

Conclusion: In general, Veterans experience little decline in income post-release and few experienced low income post-release. Some groups, such as older Veterans and senior officers, were unlikely to experience low income. However, there were several groups that warrant further research and policy consideration including females, younger, and medically released Veterans and Veterans who participated in the Rehabilitation program.

HEALTH SERVICES

Podium Presentations

4C02: How U.S. News Media Frame Military Veterans on Twitter

Parrott, Scott, PhD[1]; *Albright, David, PhD[1]; Dyche, Caitlin, PhD (Student)[2]; Steele, Hailey Grace, MA (Student)[1]

[1]The University of Alabama; [2]The University of Michigan

Introduction: Military veterans represent about 13 percent of the adult population in the United States, or more than 18.8 million people. Nevertheless, we know little about how the mass media portray this important section of the American population. In the present study, a quantitative content analysis examined how regional newspapers in each of the 50 states in the USA used a popular social media tool (Twitter) to communicate information about military veterans to the masses. We asked, "How do regional news media in the United States frame military veterans on Twitter?"

Methodology: A quantitative content analysis examined how regional newspapers in all 50 states framed military veterans on the social media platform Twitter. Coders documented the presence or absence of key characteristics in 1,460 tweets that employed the terms veteran or veterans. Data were examined using hierarchical cluster analysis.

Results: Three frames emerged. The most prevalent frame, labeled *charity case,* highlighted instances in which veterans received assistance from businesses, health-care providers, fundraisers, and charitable organizations. The second frame, *hero,* contained references to honor, specific mentions of World War II, and content that would elicit pride from audience members. The third frame, *victim,* highlighted instances in which veterans were mistreated by the military and/or society, experienced mental health issues, appeared in reference to politics, and served during the Gulf War conflicts.

Conclusion: The results presented here raise questions concerning media processes (how media content is produced) and effects (how the media affect audience members). By better understanding the processes behind media content, activists could challenge the predominant media frames concerning military veterans. Advocates for veterans could encourage alternative frames, including storylines related to employment and resiliency. The media are often most powerful when people lack experiential knowledge to contradict inaccurate information contained in media messages. The prevalence of people who have a first-hand connection to a military veteran is expected to decrease as the veteran population ages and moves further into the era of volunteer military service. Further, we need to understand how veterans perceive their own social identity, plus the role of the mass media and public attitudes in shaping those perceptions.

Poster Presentations

P143: High Users of Primary Care Services among Canadian Armed Forces Veterans

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Introduction: High users of healthcare are a small proportion of the population who account for a disproportionately large amount of

costs and utilization. The social determinants of health (SDOH) both predispose patients to becoming a high user and affect patient trajectory once they are in the high user group. High users of healthcare among Canadian Armed Forces (CAF) Veterans were examined using Veterans Affairs Canada (VAC) health expenditures, but they have not been examined in the provincial health care systems. This study will examine the well-being characteristics associated with high use of primary healthcare services among CAF Veterans.

Methodology: Secondary analysis of the 2016 Life After Service Survey will be conducted, which is nationally representative of over 56,000 CAF Regular Force Veterans released from service since 1998. It contains self-reported data on health, disability, and the determinants of health using questions from Canadian population health surveys. Characteristics of high users (top 5%) of primary healthcare services, measured as self-reported family doctor visits in the previous 12 months, will be compared with the rest of the sample, the non-high user group. Variables will be selected from a composite well-being framework that examines well-being in seven subordinate domains; embedded in which are the SDOH. For each selected variable, analysis will include descriptive frequencies, chi-square goodness of fit tests, and bivariate unadjusted odds ratios. Subsequently, multivariate logistic regression modeling will be used to identify the most significant indicators associated with being a high user of primary care. In addition, subgroup analysis of female and male Veterans will be conducted to apply a gender lens to health systems research.

Results: The hypotheses will be tested that indicators of poor well-being across several domains are associated with high use of primary healthcare services. The results will also produce a model for identifying the most significant indicators associated with high use among CAF Veterans.

Conclusion: This study has implications for improving high user care for Veterans within provincial and VAC healthcare systems, including the prioritization of upstream interventions related to the SDOH. This may lead to health system efficiency, decreased costs and utilization, and will help ensure that the right Veteran receives the right care at the right time.

PRIMARILY MENTAL HEALTH & WELL–BEING

Podium Presentations

1C02: Results of a Pilot to Engage a Whole-of-Community Approach to Suicide Prevention

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[1]Queen's University; [2]Veterans Affairs Canada

Introduction: Suicide is a tragedy that touches many in the serving military, Veteran (former military), and public safety personnel (PSP) communities. As noted in the 2017 VAC-CAF Joint Suicide Prevention Strategy, suicide prevention requires whole-of-community engagement. In May 2018, the Canadian Institute for Military and Veteran Health Research (CIMVHR) piloted a Roundtable to begin the process of bringing together Veterans, families and public and private sectors. A key objective was to engage participants in identifying opportunities and challenges for participating in suicide prevention.

Methodology: Participants were invited from across Canadian public and private sectors. The objectives were to (1) start a discussion on suicide prevention in serving military, Veterans, and public safety personnel; (2) share suicide prevention knowledge and practices; (3) start developing a participatory "whole-of-community" approach; and (4) explore next steps. Six experts summarized current evidence on suicide prevention. Two Veterans provided lived-life perspectives. Then small groups were formed to discuss two questions: 1) How can you put this information into action to help prevent suicides? 2) What more do you feel that you need to know?

Results: The expert presenters summarized evidence for suicide prevention frameworks and planning, including epidemiologic findings. Evidence is better developed for military serving members and Veterans, but is evolving rapidly for PSPs in new research studies. Seven themes emerged for whole-of-community engagement in suicide prevention: Provide education, training, and information for practitioners; Improve support for transitions across the life course; Provide support for identity challenges across transitions; Promote whole-of-community communication, collaboration, and knowledge sharing; Policy considerations for suicide prevention; Evolve whole-of-community approaches to care for suicidal persons; and Reduce barriers to services. Participants wanted more information in several areas, including: Ways to help people who need care; Roles of families; Leveraging standards for public safety personnel; Understanding differences between men and women; Developing methods for improving narrative-listening skills among health-care providers; Finding ways to efficiently turn research findings into actions; and Identifying opportunities and challenges for suicide research.

Conclusion: The roundtable demonstrated that multiple community sectors are keen to participate in suicide prevention and find value in working together. The discussions identified a variety of opportunities and challenges for all elements of the community to participate in suicide prevention. Participants reported that the meeting was valuable and asked for further development of whole-of-community engagement.

1C03: The 2017 Veteran Suicide Mortality Study: Estimating the magnitude of suicide in Canada's Armed Forces Veteran population

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Introduction: Suicide in Veterans of the Canadian Armed Forces (CAF) is a top public health concern for Veterans Affairs Canada (VAC). However, studying suicide in the Veteran population has been challenging due to a lack of a Veteran identifier in national mortality databases and VAC's inability to access all Veteran death records in Canada. To overcome these obstacles, VAC epidemiologists worked in collaboration with the Department of National Defence (DND) and Statistics Canada (STC) to link over 200,000 former CAF personnel's military records to national death records. In the largest data-linkage Veteran suicide study to date, the 2017 Veterans Suicide Mortality Study aims to estimate the risk of suicide in Canada's CAF Veteran population compared to the Canadian General Population (CGP), examining risk by sex, age group, and trends over time.

Methodology: Military career data from DND's pay system was used to identify Regular Force and Reserve Class "C" Veterans who released from the CAF as of 1976, which was when the pay system first came into effect. At STC, this list of Veterans was linked primarily by SIN to death records in the Canadian Vital Statistics Database, which was available

for deaths up to and including 2012 at the time of data linkage. Deaths due to suicide were identified by ICD-8, -9 and -10 codes. Standardised Mortality Ratios (SMRs) were calculated by sex, age group, and time period to estimate the risk of suicide in Veterans compared to CGP.

Results: Overall, male Veterans were at a statistically significantly higher risk of death by suicide compared to the CGP (SMR: 1.36, 95% CI: 1.30-1.44). This risk decreased with age, with Veterans under 25 years of age at highest risk (SMR: 2.42, 95% CI: 2.09-2.81). Female Veterans were also at a higher risk of death by suicide compared to the CGP (SMR: 1.81, 95% CI: 1.40-2.31); both younger and older Veterans were at similar risk. For both male and female Veterans, the risk of suicide remained elevated, but did not change significantly over the study period.

Conclusion: Veterans who released from the CAF between 1976 and 2012 were at a significantly higher risk of death by suicide compared to CGP. At particular risk were young male Veterans, and female Veterans overall. Findings from this study are being used to inform suicide prevention activities, while further analyses will be conducted to investigate risk factors associated with suicide in the Veteran population.

1C05: Difficult Adjustment to Civilian Life, Suicidal Ideation and Sense of Group Identity in Canadian Armed Forces Veterans: Life After Service Studies 2016 survey

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[1]Veterans Affairs Canada; [2]Department of National Defence; [3]McMaster University; [4]Memorial University; [5]University of Victoria; [6]University of Prince Edward Island; [7]None; [8]Queen's University

Introduction: The risk of suicide is higher in CAF (Canadian Armed Forces) Veterans than the Canadian general population (CGP). Suicidality is understood to be caused by incompletely clarified, complex interacting combinations of multiple well-being factors and suicidal depression. The years immediately after release from service are thought to be a time of increased vulnerability. Military-civilian transition is associated with feelings of abandonment. Social isolation and social connectedness insufficiency is associated with adverse health, premature non-suicide death and suicide. This study examined for the first time the prevalence and associations of past-year suicidal ideation, perceived difficult adjustment to civilian life and weak sense of group identity in CAF Veterans in the first 3 years after release from service.

Methodology: The 2016 Life After Service Studies survey representatively sampled Regular Force Veterans who were released from service recently in 2012-2015 (0.6-3.6 years after release) and earlier in 1998-2012. The linked dataset included socioeconomic and military characteristics and well-being indicators in multiple domains. Group identity was assessed as sense of local community belonging and feeling part of a group with shared attitudes and beliefs. Multiple logistic regression was used to identify associations.

Results: Compared to the age-sex adjusted Canadian general population, prevalences were higher in recently released CAF Veterans for suicidal ideation (10.9% versus 3.3%) and weak community belonging (51.6% versus 37.9%). Prevalences were also higher in recently released compared to earlier released CAF Veterans for suicidal ideation (10.9% versus 7.2%), difficult adjustment (42.7%

versus 29.6%) and weak community belonging (51.6% versus 39.9%). The prevalences of difficult adjustment and weak sense of local community belonging decreased with years since release from service. The majority of those with suicidal ideation (93%) had weak group identity. Measures of group identity were independently associated with difficult adjustment and suicidal ideation in adjusted regression models.

Conclusion: This is the first report of associations between suicidal ideation and weak sense of group identity in CAF Veterans during the first 3 years after release from service. Suicidal ideation was more prevalent in CAF Regular Force Veterans released since 1998. Perceived difficult adjustment to civilian life and weak group identity were more prevalent in the earliest years after release, supporting the hypothesis that this is a vulnerable MCT period. Weak sense of group identity was associated with suicidal ideation and difficult adjustment independently of other factors, suggesting the potential of fostering social connectedness in easing adaptation to post-service life and suicide prevention.

3B04: Deployment Experiences as Potentially Morally Injurious Events, and their Impact on Post-traumatic Stress Disorder and Depressive Disorder Symptom Severity (4 of 4)

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Introduction: The impact of exposure to military deployment-related events on mental health outcomes, such as posttraumatic stress disorder (PTSD) and major depressive disorder (MDD), is well-documented. However, less is known about the impact of military deployment-related events that are deemed potentially morally injurious on the development and severity of PTSD and depressive symptoms. This study aims to replicate and extend the findings of Nazarov et al.'s 2018 study using a sample of treatment-seeking Canadian Armed Forces members and veterans.

Methodology: At intake to the Parkwood Operational Stress Injury (OSI) Clinic, participants completed a number of self-report measures including the PTSD Checklist-5 (PCL5) and the Patient Health Questionnaire-9 (PHQ-9) screening tools; and a measure querying exposure to thirty unique deployment-related potentially traumatic experiences. Logistic regressions will be used to determine the impact of three potentially injurious traumatic events (feeling responsible for the death of a Canadian or ally member, seeing ill or injured women or children and being unable to help them, and having difficulty distinguishing between combatants and non-combatants) on PTSD and depressive symptom severity, respectively.

Results: To date, a total of 325 Canadian Armed Forces (CAF) members and veterans who were deployed outside of Canada at least once have completed the PCL5, PHQ-9, and deployment experiences questionnaires since December 2015. Data collection and analyses are ongoing. Over half the study sample (N = 172) reported seeing ill or injured women or children and being unable to help them; while 44% (N = 143) reported having difficulty distinguishing between combatants and non-combatants. Only 13.9% (N = 45) reported feeling responsible for the death of a Canadian or ally member. Of the 325 respondents, 65.9% met PCL5 criteria for probable PTSD, while 64.5% (N = 209) met PHQ-9 criteria for probable MDD. Further analyses to determine the

impact of endorsing potentially morally injuries events on PTSD and MDD symptom severity is ongoing.

Conclusion: Exposure to deployment-related events that are potentially morally injurious is common amongst CAF members who are deployed overseas. Understanding the impact these events may have on PTSD and depressive symptom severity has clinical relevance, as it may be equally important to address the possibility of moral injury while processing the traumatic events in treatment.

3B06: Heaven to Earth: An empirical, phenomenological, and theological contribution to understanding Canadian CF-18 fighter pilot air-to-ground combat experiences (Operation IMPACT)

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Université Laval

Introduction: CF-18 fighter pilots conducted 251 airstrikes in support of the coalition air campaign Op IMPACT over Iraq and Syria (Government of Canada - Department of National Defence, 2016). Vulnerable to a combination of unique stressors associated with air-to-ground combat, fighter pilots were also exposed to public media accusations of moral violations resulting from civilian casualties. No research to date has been conducted specifically on combat experiences and mental health outcomes of active fighter pilots (Royal Canadian Air Force, 2016). The research question guiding this inquiry is as follows: What insights into Canadian fighter pilot, air-to-ground, combat experiences would help military stakeholders make decisions contributing to pilot well-being as pilots prepare for and engage in future air campaigns?

Methodology: The interview sample, controlled for vulnerability, was taken from a small, homogenous, cohort of CF-18 fighter pilots, stationed at CFB Bagotville, who supported Op IMPACT. Six transcribed pilot interviews became the pilot corpus text analyzed for this inquiry. Using a mixed method approach within the phenomenological genre of the qualitative research tradition, I attempted to discern the meaning pilots attributed to salient emotional recollections of their combat experience (A. Giorgi & Giorgi, 2018).

Results: An initial analysis led to the following preliminary observations: *first,* pilots found their combat experiences exhilarating, the culmination of their training to date; *second*, expectations that pilots experiencing some PTSD symptoms and did not want to talk about them or their combat experiences were wrong; and *third*, pilots shared their subjective, combat experiences with me, the researcher, that they would not share with military mental health support personnel during formal debriefings. Applying an empathic reading to the corpus, "stress" was identified as the reflective, core, phenomenological theme recalled during pilot interviews. Next, applying a critical reading, "shame/honour" were identified as deeper, unreflective, core, phenomenological themes embedded in the phenomenon of stress.

Conclusion: This inquiry brings military leaders, military support personnel working with pilots, and other interested stakeholders into contact with a sampling of pilot combat experiences. My intent is 1) to inform and guide policies and practices improving support for pilots as they prepare for and engage in future air campaigns; and 2) to expand mental health research targeting the uniqueness of fighter pilots in the CAF community.

4C01: The State of Knowledge on Homelessness among Women Veterans: A systematic review of the literature

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Introduction: Veterans' homelessness is a growing concern in Canada. There are 697,400 veterans in the general population, approximately 2,950 of whom are estimated to be shelter users, which is one form of homelessness. Veterans have been estimated to make up 2.2% of the homeless population (ESDC, 2016). Most of the existing literature pertaining to homeless women veterans has focused on the USA homeless women veterans' population. Unfortunately, we know little about the experience of homelessness for the Canadian homeless women veterans. The primary goal of this systematic review is to assess and summarize existing research on homelessness among female veterans to understand their unique experiences and identify what is known about how to address this problem. Secondary goals of this review are to identify major gaps in the existing knowledge base for the homeless women veterans, and to provide recommendations for future research.

Methodology: The stages for systematic review proposed by Cooper (1984) were employed for this review. Electronic databases (CINAHL, PsycINFO, ScienceDirect, Scopus, ProQuest Dissertation and Theses), Canadian Homeless Hub and the Journal of Military, Veteran, and Family Health were searched for relevant research studies up to the search date (February 14th 2017). Data were abstracted on study design, sample, intervention, outcome and topic from studies meeting inclusion criteria. To meet the inclusion criteria, articles needed to focus on homeless women veterans and be written in English. The following terms were used; homeless veteran, homeless female veteran, and homeless women/woman veteran.

Results: Initial Search resulted in 95 articles. Thirty three were duplicates, and 62 articles were reviewed for relevance. Thirty relevant studies were included. A relatively small number of studies have been identified through this systematic review of literature. Most research on homeless women veterans has been done in US. Most of the reviewed studies were observational. Few studies were experimental. No Canadian studies have been found on homeless women veteran's population. Given the lack of knowledge regarding this population, exploratory qualitative studies needed to be employed first to understand the experience of homelessness for Canadian women veterans.

Conclusion: Most research on homeless women veterans has been done in US. Most of the reviewed studies were observational. Few studies were experimental. No Canadian studies have been found on homeless women veteran's population. Given the lack of knowledge regarding this population, exploratory qualitative studies needed to be employed first to understand the experience of homelessness for Canadian women veterans.

4C03: Veterans' Perspectives on Operational Stress Injuries: Personal and environmental influences

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University of Calgary

Introduction: Military personnel who have been deployed often

experience Operational Stress Injuries (OSI), which are associated with mental illness, psychosocial difficulties, and moral injuries. Consequently, veterans with OSI often experience a loss of identity and struggle with the transition to civilian life. Veterans' voices are essential to understanding how to heal OSIs, but no research has focused on OSI from veterans' perspectives nor sought to understand the possible connections between their mental, emotional, psychosocial, and spiritual components of wellbeing.

Aim: To develop a model of OSI and wellbeing from the perspectives of post-combat veterans.

Methodology: In this Glaserian grounded theory study, we recruited veterans with mixed military backgrounds from local and governmental organizations from February 2017- May 2018 to understand their experiences with OSI and wellbeing. To date, we have purposively sampled 16 of approximately 20 veterans for individual interviews, which were audio-recorded, transcribed, coded, and constantly compared to discover underlying theoretical categories.

Results: Preliminary results indicate that OSI transcends PTSD; instead, mental health, moral distress, a loss of identity, and an inability to transition were connected and experienced simultaneously. Veterans' pre-combat training incorporated a radical reprogramming of "self," which permanently transformed them into soldiers. This transformation was congruent with who they wanted to be and provided them with techniques to survive battle and complete the mission. Going to combat did not exclusively deteriorate their mental health; rather, it was the combination of morally injurious experiences, that fractured their sense of self, the mission, and their trust in the military which contributed to declining mental health. When injured soldiers transitioned out of the military, their difficulties became acute and veterans described feeling as if they were living in "limbo" because of feeling alienated from both military and civilian life, and more importantly, from themselves. Transitioning to civilian status was a nullifying experience—a "death of self"—as they felt they lost their identity, purpose, and meaning in life, which created a broad sense of hopelessness and helplessness. Veterans suggested that effective treatment must not focus exclusively on mental health symptomology, but also address their moral distress, lack of identity, and fractured sense of self.

Conclusion: This unique study offers a comprehensive understanding of veterans' wellbeing that incorporates mental, emotional, psychosocial, and spiritual dimensions. It will provide healthcare professionals with a model for efficiently addressing veterans' needs and perhaps the needs of those in para-military organizations, such as first responders.

5C02: Defining Post-traumatic Stress Disorder in Primary Care: Veterans and military families

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Introduction: Post-Traumatic Stress Disorder (PTSD) is a mental health disorder that impacts approximately 7% of the population, with rates among military veterans estimated to be 14%. It is associated with poor overall and mental health and increased risk of suicide. Despite it being so common, there are major gaps in knowledge regarding PTSD, particularly within primary care.

Methodology: This study will use data from the Manitoba Primary Care Research Network (MaPCReN), a provincial network within the national multi-disease Electronic Medical Record based repository, the Canadian Primary Care Sentential Surveillance Network (CPCSSN). This project has two main objectives: 1) to develop and validate an algorithm to identify PTSD; and 2) Utilize free-text information to increase our ability to understand the primary care experiences of veterans and military families. We will develop an EMR-based reference standard for PTSD by evaluating health condition lists (problem lists) and visit billing codes in the MaPCReN data repository. We will then apply natural language processing (NLP) and machine learning tools to unstructured free-text in the primary care EMR's to identify and validate a diagnosis of PTSD. We will also apply NLP tools and algorithms to refine existing analytic models that identify patients who are 'Veterans' or 'Family of a Military Service Member' with inclusion of structured, semi-structured and unstructured free-text contained in primary care EMR's.

Results: By utilizing these definitions, we will estimate the prevalence of PTSD in the MaPCReN database and within the Veterans and Military Family Cohort. Furthermore, we will compare care delivered to patients identified with diagnosis of PTSD between the general population and those identified as being a Veteran or Family of Military Service Member; as well as between Veterans or Family of Military Service Member with PTSD diagnosis versus those without a PTSD diagnosis.

Conclusion: PTSD is a complex chronic disease, often presenting in subtle and varied ways. To date, little is known about PTSD care in primary care settings. The algorithms and techniques developed will provide much needed insight into PTSD identification, particularly for Veterans and military families. The success of this study will support new ways to approach and use EMR data to advance research and PTSD care by describing at risk cohorts of patients. Further understanding of the epidemiology of PTSD will inform strategies to optimize the care for these patients.

5C04: The Prevalence and Severity of Mental Health Disorders in UK Veterans and Non-veterans

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Introduction: Ensuring there are appropriate services to support the mental health needs of veterans is a UK government priority, yet there has been little published research which has compared the mental health of veterans to those who have never served in the military. This study aims to address this issue by examining the prevalence and severity of common mental disorders (CMD), PTSD and alcohol misuse in veterans compared to non-veterans while accounting for important socio-demographic characteristics such as employment status and social grade.

Methodology: This study uses a large representative sample of UK veterans taken from the 2014 King's Centre for Military Health Research cohort (KCMHR). This veteran sample is matched on age and gender with two separate large, nationally representative UK datasets:

Understanding Society study (UKHLS) to allow for comparisons in CMD (both surveys use the ghq-12 to assess CMD)

Adult Psychiatric Morbidity Survey (APMS) to compare PTSD and alcohol misuse (both surveys use the PCL-C to assess PTSD and AUDIT to assess alcohol misuse).

UKHLS and APMS surveys who have ever served in the military are excluded from our analysis.

Prevalence of CMD, PTSD and alcohol misuse are calculated, and adjusted logistic regression analyses used to compare veterans and non-veterans in working and non-working groups after accounting for socio-demographic characteristics. The prevalence of individual symptoms for these mental health problems are also compared. Finally, we conduct separate logistic regression analyses for our veteran (KCMHR) and non-veteran (APMS/UKHLS) samples to examine the association between sociodemographic characteristics and mental health.

Results: After adjusting for age and gender, overall veterans are more likely to have CMD than non-veterans (AOR 1.47, CI 1.29-1.69). This was also found amongst those in employment (AOR 1.68, CI 1.44-1.97), unemployed (AOR 1.88, CI 1.02-3.45) and retired (AOR 2.42, CI 1.13-5.58). The mean GHQ-12 score is significantly higher for veterans (1.99, CI: 1.88-2.11) than non-veterans (1.47, CI: 1.38-1.57). Feelings of uselessness, worthlessness and a lack of confidence appear to be more common amongst veterans. Being long term ill or disabled and no-longer being married are more strongly associated with poor mental health for veterans than non-veterans.

Comparisons of PTSD and alcohol abuse are currently underway.

Conclusion: Early findings indicate that CMD are more prevalent and severe amongst veterans than comparable non-veterans. The remaining analysis will be conducted in July.

Poster Presentations

P145: Development and Evaluation of the Expressions of Moral Injury Scale: Military version

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Introduction: There is consensus that military personnel can encounter a far more diverse set of challenges than researchers and clinicians have historically appreciated. Moral injury (MI) represents an emerging construct to capture behavioural, social, and spiritual suffering that may transcend and overlap with mental health diagnoses (e.g., post-traumatic stress disorder and major depressive disorder). The Expressions of Moral Injury Scale—Military Version (EMIS-M) was developed to provide a reliable and valid means for assessing the warning signs of a MI in military populations.

Methodology: Drawing on independent samples of veterans who had served in a war-zone environment, factor analytic results revealed 2 distinct factors related to MI expressions directed at both self (9 items) and others (8 items). These subscales generated excellent internal consistency and temporal stability over a 6-month period. When compared to measures of post-traumatic stress disorder, major depressive disorder, and other theoretically relevant constructs (e.g., forgiveness, social support, moral emotions, and combat exposure), EMIS-M scores demonstrated strong convergent, divergent, and incremental validity. In addition, although structural equation modelling findings supported a possible general MI factor in Study 2, the patterns of associations for self and other-directed expressions yielded evidence for differential validity with varying forms of forgiveness and combat exposure.

Results: The EMIS-M provides a face valid, psychometrically validated tool for assessing expressions of apparent MI subtypes in research and clinical settings.

Conclusion: Looking ahead, the EMIS-M will hopefully advance the scientific understanding of MI while supporting innovation for clinicians to tailor evidence-based treatments and/or develop novel approaches for addressing MI in their work.

P146: Moral Injury in Older Adult Military Veterans Seeking Mental Health Services

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Introduction: Moral injury involves acts that violate or contradict an individual's core beliefs about what is ethically acceptable, such as perpetrating, witnessing, or failing to prevent perceived moral transgressions or experiencing betrayals by those in positions of leadership. Morally injurious events can lead to psychological distress and impairment including intense guilt and shame, reduced ability to trust others, and difficulty with forgiveness. In the past few years, research has begun to operationalize the term moral injury, examine the impact of moral injury on the mental health of military veterans, and examine the implications of moral injury for psychological treatment. Research has yet to examine moral injury in older adults. Older adults present with unique mental health needs, symptom presentations, and other factors (e.g., stage of life) compared to younger adults. Continuing to understand the unique needs and symptom presentation of older adult veterans is important for providing effective evidence-based assessment and treatment services. The goal of the current study is to add to the growing literature on moral injury and operational stress injuries by examining moral injury in older adult Canadian military veterans who presented for mental health services at an Operational Stress Injury Clinic.

Methodology: Participants will include older adults (>65 years of age) who presented for services at a specialized tertiary care mental health centre for military veterans. Participants completed the Moral Injury Events Scale as well as self-report measures of mental health symptoms (e.g., Quick Inventory of Depressive Symptomatology, Posttraumatic Stress Disorder Checklist) as part of a battery of measures at intake.

Results: Moral injury scores and the relationship of those scores to other mental health symptoms (e.g., symptoms of depressions, symptoms of posttraumatic stress disorder) will be presented.

Conclusion: Implications for assessment and intervention with older adults military veterans will be discussed.

P147: Do Psychological Therapies Provided by the UK's National Health Service Services Meet the Needs of Veterans?

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Introduction: Once UK military personnel leave the Armed Forces, the responsibility for their physical and mental care falls to the National

Health Service (NHS). Given that the prevalence of mental health problems is greater amongst UK veterans than in the general population, and that under the Armed Forces Covenant the UK government are obligated to ensure the wellbeing of its veterans, it is crucial to establish whether the treatment needs of this population are being met.

To ensure that we have services that meet the needs of the veteran population we must know if generic treatments offered by NHS services are as effective for those who have served in the military as they are for the general public. Currently, the majority of UK veterans with mild to moderate mental health problems, such as non-severe post-traumatic stress disorder (PTSD), anxiety disorders and depression, are likely to receive psychological treatment in generic NHS Improving Access to Psychological Therapies (IAPT). There is, however, no data examining whether these generic treatments are effective for veterans and whether the outcomes differ to non-veterans.

Methodology: This study will examine nationally collected data from NHS IAPT services gathered between 2014 – 2017 to compare the mental health and treatment outcomes of these health seeking veterans and non-veterans. Specifically, this study will:

1. Determine how sociodemographic characteristics and diagnoses differ between veterans and non-veterans.

2. Establish if symptom severity and co-occurrence of disorders differs between both groups.

3. Compare treatment outcomes for veterans and non-veterans by diagnoses and across different sociodemographic groups.

Results: The following analysis will be conducted when IAPT data is released to us on July 2018.

- Sociodemographic characteristics, welfare needs, diagnoses and mean scores on baseline psychological measurement tools will be compared. Univariable and multivariable logistic regression analyses will be used to examine the association between veteran status and sociodemographic and welfare characteristics.
- Adjusted logistic regression analyses will be used to examine the association between veteran status, individual diagnosis and caseness status at baseline. The proportion with comorbid disorders will be compared, with multinomial logistic regression analyses examining whether veteran status predicts total number of mental health conditions.
- Caseness status will be assigned pre and post treatment. Sociodemographic factors associated with transition from case to non-case will be explored using univariable and multivariable logistic regression.

Conclusion: This research will produce highly sought-after information on how veterans differ from non-veterans in terms of their access to and benefit from generic mental health services.

P148: PTSD Symptoms in Veterans with Dementia: A case study

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Introduction: Posttraumatic Stress Disorder (PTSD) is a mental health condition often associated with exposure to military trauma. Recent evidence has found that Veterans with PTSD may have a higher risk of developing dementia. PTSD may worsen or re-emerge following the onset of dementia leading to symptoms such as re-experiencing traumatic memories, nightmares, hyperactivity, suspiciousness and aggression.

In long-term care environments, triggers such as hearing different languages, seeing ailing bedridden patients, and loud noises are present and may exacerbate PTSD symptoms in Veterans with dementia. These triggers often go unnoticed by healthcare providers who cannot differentiate between PTSD and dementia symptoms versus dementia only. The purpose of this research study is to investigate and better understand PTSD symptoms from the perspective of Veterans with dementia, their caregivers, and their healthcare providers in Veteran long-term care facilities.

Methodology: A case study method will be used for this research. Each case, or triad, will include a Veteran with PTSD symptoms and dementia, a caregiver, and the healthcare providers in a long-term care facility. One triad will be recruited from a Veteran long-term care facility in Ontario.

Data collection will include interviews, observation, and document review. Semi-structured interviews will be conducted with a Veteran who is experiencing PTSD symptoms and dementia, along with their caregiver and healthcare providers (Personal Support Workers, Registered Nurse and Nurse Practitioner/ Physician). Unstructured non-participant observation will be conducted in each of the long-term care facilities focusing on the Veteran with PTSD symptoms and dementia in their physical and social environment. The third form of data collection will involve using documents related to the case, including patient charts and standardized assessments.

Results: Thematic analysis will be used as an overall strategy to identify, analyse and report patterns within the data. Analysis will be done inductively to develop an understanding of the themes in the case.

Conclusion: This study will provide foundational information to contribute towards understanding and identifying PTSD symptoms in Veterans with dementia who are living in a Veterans long-term care facility. This study can also help raise awareness among healthcare providers working in long-term care facilities.

P149: Establishment of Montreal Cognitive Assessment Normative Data for Canadian Armed Forces Veterans with Operational Stress Injuries

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Introduction: Empirical evidence suggests that cognitive dysfunction frequently co-occurs with psychological disorders, such as a decline in processing speed in major depressive disorder, and attention and memory in posttraumatic stress disorder (PTSD; Horner & Hamner, 2002; McDermott & Ebmeier, 2009). The Montreal Cognitive Assessment (MoCA) is a validated cognitive screening measure designed to identify individuals with cognitive dysfunction indicative of mild cognitive impairment and/or dementia, and is frequently used in primary care settings to determine whether a diagnostic assessment with further cognitive testing is necessary (Geldmacher & Kerwin, 2013; Lonie, Tierney, & Ebmeier, 2009; Nasreddine et al, 2005). Many studies have

derived comparative norms for this measure in different populations, finding education and age to be correlated with scores (Kenny et al., 2003; Rossetti et al., 2011). However, few studies have examined typical results when a psychiatric diagnosis is present.

Methodology: This study aims to establish normative data for Canadian Armed Forces (CAF) veterans who presented to a specialized outpatient mental health clinic and were subsequently diagnosed with a psychiatric disorder. The specific goals of the study are 1) to establish norms for a Canadian Veteran psychiatric help-seeking population, and 2) to identify typical patterns of MoCA subtest scores as they differ by type of psychiatric illness (e.g., depression vs. PTSD).

Results: Data collection is ongoing. Using preliminary data from 195 participants, the majority (88%) of whom are male, the average MoCA score was 26.1 (range 17-30). The average subtest scores were as follows: visuospatial/executive score was 4.3/5, naming 3.0/3, attention 5.6/6, language 2.3/3, abstraction 1.6/2, delayed recall with no cue 3.0/5, and orientation 5.8/6. Analyses to identify patterns of MoCA subtest scores by clinical diagnosis (PTSD only, depressive disorder only, both PTSD and depressive disorder, and by substance use status) are currently underway.

Conclusion: The average MoCA score for our preliminary mental health treatment-seeking CAF veteran cohort was 26.1, which is considered the cut-off score for healthy controls, suggesting that approximately 50% of the studied population would be flagged for further evaluation. This finding suggests that normative data for CAF veterans with operational stress injuries may be different than general or other clinical populations. Further analyses will be conducted to better establish these norms within a larger sample.

P150: Exploring Harm Reduction among Canadian Veterans Experiencing Homelessness

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Introduction: The use of substances, particularly alcohol, is substantially higher among people experiencing homelessness than the general population (Podymow, Turnbull, Coyle, Yetisir, & Wells, 2006). In Canada, veteran homelessness is an increasing concern and it is estimated that there are 2,950 veterans experiencing homelessness (Gaetz et al., 2016). Furthermore, veterans often use substances, particularly alcohol, to cope with the transition from military to civilian life (Ray & Forchuk, 2011). A strategy that has been shown to reduce the negative harms of substance use and facilitate housing stability is harm reduction (MacNeil & Pauly, 2010). Given the little research in Canada on veteran homelessness, exploring how veterans perceive harm reduction may be important to address this group's unique housing and health needs.

Methodology: This study was a secondary analysis on data collected from *The Canadian Model for Housing and Support of Veterans Experiencing Homelessness,* which evaluated a veteran-specific housing model in four Canadian cities (Forchuk & Richardson, 2015). In total, 78 veterans were enrolled in the primary study and qualitative data was collected via focus groups with veterans, staff, and stakeholders in three cycles at each of the four sites from 2012-2014. For the secondary analysis, a thematic analysis was conducted on the veteran focus group data, whereby transcripts were analyzed for themes related to harm reduction. Quotes were extracted and

organized into themes that captured the veterans' understanding of harm reduction.

Results: The overarching theme that emerged was that veterans' perceptions of harm reduction were influenced by the interface between military culture and homeless serving culture. Various subthemes were also revealed including (a) Regimented Structure, (b) *Peer Support*, (c) Congruent Recovery Journeys, (d) *Location: Close Enough to Services, Far Enough from Harm, and* (e) *Harm Reduction is Housing Stability and Housing Stability is Harm Reduction*. These themes have demonstrated that veterans are a unique group with specific housing and addiction needs. Veterans considered harm reduction as an essential component of housing, as it helped to create stability in their lives

Conclusion: This study has shown that veterans have unique housing and addiction needs that are distinct from the general homeless population. Furthermore, harm reduction may be an effective part of the solution to veteran homelessness. The findings of this study may inform the development of policy to shape the way in which nurses, institutions, and the government address this groups' housing and addiction needs.

P151: Homeless Indigenous Veterans in Canada and the Current Gaps in Knowledge: A systematic review of the literature

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Introduction: The objective of this systematic review was to assess the current literature on homelessness among Indigenous veterans to understand their unique experiences, to identify the gaps in the existing knowledge base, and to provide an insight into future research.

Methodology: This study searched electronic databases including CINAHL, PsycINFO, ScienceDirect, Scopus, The Homeless Hub and the Journal of Military, Veteran, and Family Health for relevant research articles up to the search date (February 14th 2017). Search terms included "Indigenous", "First Nations", "Native", "Aboriginal", "homeless", "homelessness" and "veterans". References within key articles were also searched. To meet inclusion criteria, articles needed to focus specifically on homeless indigenous veterans, and be written in English. Grey literature was also explored in order to supplement the search and provide further contextual underpinnings but these were not subject to review or analysis.

Results: The initial search resulted in 32 research articles. No previous systematic reviews were identified, making this review the first of its kind. Ten articles did not focus on Indigenous veterans and only focused on homeless veterans in general, eight did not investigate homelessness but did focus on Indigenous veterans, six did not focus on veterans, three explored Indigenous veterans and homelessness but independently of each other, three articles were duplicates, and one article which had not been published at the time of the search and therefore the full text could not be accessed. This left only one study that met inclusion criteria and it had been conducted in the United States. The study identified that homeless Indigenous veterans were more likely to abuse alcohol and spent a greater number of days intoxicated but were less likely to abuse drugs and experience psychiatric problems compared to white homeless veterans.

Conclusion: There is currently an inadequate amount of research to

draw concrete conclusions, thus further investigation from Canadian researchers is desperately needed. However, only one paper was identified indicating that this is not solely a lack of Canadian literature, but also a lack of research conducted by the international community. Through identifying the gaps in the literature, this review encourages greater emphasis on future research and potential for policy change. Stakeholders that would benefit from further research would include Veteran Affairs Canada, homeless-serving and housing agencies, mental health and addiction services, provincial and municipal representatives, and Indigenous groups.

P152: To What Extent have Dog Training Schools been Successful in Pairing Veterans with Psychiatric Service Dogs?

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Introduction: Our research team quantified the effectiveness at 6 months following provision of psychiatric service dogs (PSD) among 23 veterans with PTSD. This exploratory case study documents and compares the characteristics of 7 dog training schools regarding their pairing processes between veterans affected by PTSD and a PSD (admission, training and follow-up).

Methodology: A 3-step data collection was completed between 2015 and 2017: 1) records of informal communications with 31 veterans involved since the admission (emails, phone calls), 2) phone interviews with 7 dog trainers 3 months after dog attribution, and 3) face-to-face meetings with officials or trainers of 7 schools (BC=2, AB=1, ON=2, QC=1, KS=1) conducted by 6 members of the research team during which a cross-sectional questionnaire was completed. Qualitative thematic analysis was applied to the interview transcripts with QDA Miner Lite Version 5.

Results: Key differences were reported between training schools in four specific areas: 1-selection of the PSD-veteran dyads and coordinating communication; 2-training methods, including the bonding process and the PSD's profile and task requirements; 3-the PSD's unique features that promote pairing; and 4-challenges during training, including drop-out motives. All schools paid particular attention to the bonding process. All schools reported PSD's tasks such as intervening when the veteran showed traits of anxiety or dissociation, ensuring greater personal space in public, intervening during nightmares and applying physical pressure when required. Some schools reported training the PSD in standard tasks, while others put the training emphasis on the veteran's personal needs. Five veterans (16%) dropped out early during the admissions process (3 for undisclosed reasons and 2 for a lack of communication or trust). Two veterans (6.5%) dropped out during training (1 for unmet expectations regarding the level of the dog's training and 1 because of second thoughts about acquiring a PSD). During follow-up, three veterans (9.7%) returned their PSD (1 for allergies and 2 for undesired dog's behavior).

Conclusion: 23 veterans (74.2%) were still successfully paired with their PSD 6 months after having completed training. In contrast to other studies with different types of services dogs and clienteles, this case study reveals that most dropouts (5/8; 62.5%) occurred before training started, and predominantly involved 4 of the training schools studied. The quality of communication between the veteran and trainers as well as knowledge of PTSD symptoms that may influence it (e.g. avoidance, manifestations of anxious or irritable behaviours) are potential determinants of a successful pairing with a PSD.

P153: AUDEAMUS Service Dog Program: An evidence-based curriculum supporting the health and well-being of Veterans

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Brief Description: It is established that Operational Stress Injury (OSI) resulting from military duty is a serious concern in Canada. OSI refers to psychological struggles resulting from operational duties, with Post-Traumatic Stress Disorder (PTSD) being the most common form. Service dogs are increasingly incorporated as part of clinical supports for persons traumatized in the line of duty who suffer from PTSD and other injuries. When paired with a veteran, highly skilled and effective certified service dogs can serve to enhance coping with relationships, daily functions, work through task-based training and bridge connection to one's self and others through the human-animal bond. At present, there is a need for evidence-based curriculum within the psychiatric service dog (PSD) field in Canada. AUDEAMUS, Inc., a bilingual, injured veteran-run, Canadian not-for-profit organization which began in 2016, has developed an evidence-based curriculum that is holistic, measurable and focused on the therapeutic effects of psychiatric service dogs on veteran health.

Clinical Outcomes: The AUDEAMUS curriculum adheres to military pedagogy, adult education principles and is evidence-informed by the One Health model and gender and trauma-informed care principles. Identified in its logic model, short, medium and long-term program outcomes guide the training and peer-on-peer support provided. Working closely with the veteran's mental health professional, the intended outcomes include improved psychological functioning, family and social relationships, and reduced use of medications, substance use, and maladaptive symptoms such as stress, anxiety, aggression, and nightmares. Emphasis is placed on an eventual return to a career path, positive functioning, and peer mentoring.

Patient Population: AUDEAMUS serves veterans that have an OSI or PTSD with the aim to complement their existing health treatment plan. To date, 80 veterans have been matched with an AUDEAMUS service dog. An additional 25 veterans remain on a waiting list. Program implementation is showing early signs of success. For example, 30 veterans have completed the AUDEAMUS program, 10 are in the peer trainer development program, 3 are in postsecondary school, and 5 have returned to full time work.

Conclusion: Leading by example, the AUDEAMUS program is working to develop a program based on an evidence-based curriculum in the PSD field in Canada. This is being done by 1) developing a veteran-centered, pedagogically sound curriculum and training materials, 2) involving and integrating the latest veteran and PSD research evidence, and 3) working collaboratively with health professionals to support the mental health needs of veterans.

P155: Partners Supporting Transition

*Tibbetts, Chrystal, BA

Office of the Veterans Ombudsman

Introduction: To understand the current Canadian research on transition from military to civilian life, the Office of the Veterans Ombudsman (OVO) conducted a qualitative research project *Transitioning Successfully: A Qualitative Study* and presented the findings at the 2017 CIMVHR Forum. It delved into the lived experience of medically-released Veterans who self-identified as having successfully transitioned to civilian life. A major finding of this research was that spouses were considered to be one of the greatest sources of support for transitioning members. *Partners Supporting Transition* further examines this relationship by exploring the lived experience from the perspective of the partners of Veterans who have successfully transitioned.

Methodology: This small qualitative study will be conducted in two phases; an online survey and in-depth focus groups. A sample of 10-20 volunteer participants will be used. Participants will self-identify as partners of Canadian Veterans who released, either medically or non-medically, between 2006 and present day and self-identify as having successfully transitioned. Participants will be screened based on their demographic profile so as to achieve a representative sample (branch of service, gender, officer, non-commissioned member, dual service families, years of service, medical or non-medical release.

The online survey will consist of a variety of questions related to the experience of the transition process for partners of Veterans. Questions would be related to the 7 areas of interest identified during the *Transitioning Successfully: A Qualitative Study*; the transition process, transition programs and services, health and disability, employment and education, income and financial well-being, family, peer and social support; and, military culture. Also included are demographic questions and consent/desire to participate in Part II of the study.

The focus groups will be facilitated to allow for in-depth conversations and data gathering. The desired participation rate would be 5-10 participants divided between 2 focus groups. Questions would be much more specific than the online survey so as to spark in-depth conversation between participants.

Results: This research project is currently in its early stages. As such, results and findings will only first be available at the 2018 CIM-VHR Forum. It builds, however, on the findings from the previous qualitative study that examined the lived experience of Veterans.

Conclusion: The results of the study be used to help identify and better understand the factors that contribute to or make more challenging the transition process for partners of Veterans who have successfully transitioned.

P156: Enhancing Mental Health Treatment: The "Treatment Overview" Group

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Edmonton Operational Stress Injury Clinic

Brief Description: For over two years the Edmonton Operational Stress Injury Clinic (EOSIC) has offered a rotating schedule of seven 90 minute weekly group learning sessions. The sessions cover the basic skills that would otherwise be taught in individual sessions at the beginning of treatment. The Treatment Overview (TO) series provides clients who are on a waiting list weekly with clinic contact, and allows graduating clients to refresh their basic skills, learn recovery maintenance techniques, and make easy, gradual, transitions out of the clinic. The TO series is also used as an exposure treatment for clients with avoidance to crowds, and as a transition to treatment groups. The skills covered in TO are:

Anxiety Management: Diaphragmatic breathing, cued muscle relaxation, mindfulness, multi-sensory imagery, cognitive behavior therapy, gradual exposure strategies for reducing reactions to triggers.

Sleep hygiene: Sleep cycles, pre-sleep routines and returning to sleep after awakenings, bed and bedroom associations, sleep compression, and nightmare reduction.

Depression Management: Physical, environmental, behavioral, and cognitive self-help methods, brief overview of the role of anti-depressants.

PTSD: The DSM-5 diagnostic criteria, the main treatment methods (Prolonged Exposure, Cognitive Processing Therapy, Eye Movement Desensitization and Reprocessing, and Cognitive Behavior Therapy), how to maintain gains following graduation.

Medication/Substances: How pain medications work. How benzodiazepines, alcohol and marijuana affect clients' ability to benefit from PTSD treatment. Questions and answers about medications with a clinic psychiatrist.

Anger Management: When anger is normal and constructive, the physiology of anger, assertiveness techniques, cognitive behavior therapy, and the identification of underlying causes of anger.

Pain Management: What pain is, the uses of: distraction, muscle relaxation, knowing or assigning the meaning of pain, and mood, in the management of pain, the use of medications in pain management.

Clinical Outcomes: Clinical outcome studies are in the preliminary stages. Client satisfaction surveys and clinician feedback indicate that clients feel they greatly benefit from this service.

Patient Population: The patients served are clients in the EOSIC: military Veterans, serving and Veteran RCMP members, serving military, and family members of these clients. The clients have been referred for treatment of post-traumatic stress disorder, depression, and other operational stress injuries.

Conclusion: Feedback from participants and their clinicians suggests that the TO education series provide clients with basic and useful symptom management information prior to starting treatment. Clients who have been in the TO series appear to find later group therapy less threatening. The series also allows clients a transition between treatment and discharge from the clinic.

PRIMARILY PHYSICAL HEALTH & WELL–BEING

Podium Presentations

3C05: Diabetes Prevalence in Canadian Veterans

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Introduction: The prevalence of diabetes in Canadian Armed Forces (CAF) and Royal Canadian Mounted Police (RCMP) veterans may differ from the general population as the result of operational experience, including physical fitness expectations and occupational exposures. This study provides the first longitudinal overview of diabetes prevalence in veterans using administrative data from the Ontario public health system.

Methodology: A dynamic retrospective cohort of Canadian veterans who released from the CAF or the RCMP between January 1, 1990 and March 31, 2013 and resided in the province of Ontario was previously established using databases held at the ICES. The end of follow up was March 31, 2014. Cases of diabetes in this cohort were identified using a previously validated algorithm using both inpatient and outpatient administrative health data. The prevalence of diabetes was calculated by age group, sex, age group at release, time since release, and calendar year. Age groups were chosen to facilitate comparison with the general population (<50, 50-64, 65 and older).

Results: The cohort included 23,818 Veterans. The majority were male (86%), 48% left the CAF or RCMP before 2000 and all were followed for a median of 9 years. Overall, 4.5% of veterans met the diabetes case definition in the first five years following release. Diabetes prevalence rates differed by sex, age, and calendar year. For example, in 2012, the prevalence of diabetes was 12.6% and 8.0% in male and female veterans aged 50-64. In 2012, the prevalence estimates for men and women over 65 were 20.3% and 14.1%, respectively, compared to 3.6% and 3.2% in men and women under 50. Diabetes prevalence was 2 to 4 times higher in 2012 compared to 2000, depending on age group and sex.

Conclusion: Our study suggests diabetes prevalence rates in veterans may differ from rates in the general population and from those reported in studies of veterans using self-reported measures. Regardless, diabetes prevalence in veterans is increasing and this information can be used to inform health policy and to ensure that the long-term health needs of Canadian veterans are met.

MIXED MENTAL & PHYSICAL HEALTH & WELL–BEING

Podium Presentations

1A05: An Analysis of Well-being among Spouses of Recently Medically Released Veterans Using the Canadian Armed Forces Transition and Well-being Survey (5 of 5)

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Department of National Defence

Introduction: Results of previous studies suggest that ill or injured Canadian Armed Forces (CAF) veterans who are medically released experience greater difficulty adjusting to civilian life. Moreover, a pilot study demonstrated that illness among service members/veterans can contribute to caregiver burden and psychological distress among military spouses. However, dyadic research; that is, research examining bidirectional associations between the characteristics of ill or injured service members/veterans and their spouse has been limited. To address this limitation, this study examined the relationship between the well-being of recently medically-released CAF veterans and the well-being of their spouse.

Methodology: The CAF Transition and Well-being Survey was administered to about 1,400 recently released CAF veterans and 600 spouses by Statistics Canada on behalf of the Department of National Defence in 2017. The goal of the survey is to develop a better understanding of the transition to civilian life, especially among veterans who were medically released, and provide information to help improve programs and services offered to service members and their families during this important phase of the career. The survey included Regular Force veterans who were released in 2016 with two or more years of service, as well as participating spouses.

Results: In order to examine the direct impact of veterans' physical and psychological health on spousal well-being and caregiver burden, only the dyad data (i.e., paired data matching medically-released veterans with their spouse) will be used for the purposes of this analysis. Regression analysis will be used to examine the crossover effects of illness or injury among CAF veterans on spousal well-being.

Conclusion: Findings from this survey will help highlight not only the unique experiences of CAF members and veterans transitioning to civilian life due to their illness or injury, but also the lasting effects on well-being of their significant others. By gaining a greater understanding of the experiences of families transitioning to civilian life and the impacts of illness or injury, the Department of National Defence/CAF and Veterans Affairs Canada will be better equipped to provide support to military families at different stages of the military to civilian transition.

1C01: Life Course Well-being Framework for Suicide Prevention in Canadian Armed Forces Veterans

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Introduction: The risks of suicidality, meaning suicidal ideation and behavior, are higher in Canadian Armed Forces (CAF) Veterans (former members) than in the Canadian general population. Prevention of Veteran suicides is a top priority for government. In response to the Prime Minister of Canada's 2015 mandate letter, the Ministers of CAF (Canadian Armed Forces) and VAC (Veterans Affairs Canada) announced the Joint Suicide Prevention Strategy in 2017. Suicide prevention requires whole community engagement, but it can be difficult for many to find their role. This paper describes the evidence-based theoretical framework that informs Veteran suicide prevention.

Methodology: The framework was devised to be easy to understand and consistent with published theories and empiric evidence. Evidence examined includes published suicide research, a review of findings from epidemiological studies of suicidality in CAF Veterans released since 1976, participation in CAF expert panels in 2009 and 2016,

and literature reviews conducted at VAC since 2009.

Results: Many theories have been proposed for suicide but none has been fully validated. Common to all is the understanding that suicide causation is multifactorial and varies individually such that factors interact rather than lie along linear causal chains. Evidence indicates that Veterans are influenced onto, along and off suicide pathways by variable combinations of mental illness, stressful life events in multiple areas of well-being; personal vulnerability factors including suicidal diathesis formation, impulsivity and acquired capacity; access to well-being supports; access to lethal means; and imitation. The framework has three core concepts: a superordinate, composite well-being conceptual framework; the life course view; and the suicide pathway from ideation to behaviour.

Conclusion: The framework is consistent with existing theories and empiric research evidence and unlikely to preclude new findings about the causes of suicide and effectiveness of suicide prevention activities. No single factor causes suicide, so suicide prevention requires a multidimensional approach to suicide prevention that addresses determinants of all the domains of well-being in the areas of prevention, intervention and postvention at the levels of individuals, vulnerable subpopulations and whole populations. The framework therefore promotes both mental health care and attention to other well-being determinants of suicide. More remains to be understood about reasons for the higher risk of suicide in CAF Veterans. In the meantime, the framework is expected to help with the challenging question, "What can *we* do?"

1C04: Operation Deep Dive: Preliminary lessons from a longitudinal study of community risk factors for suicide and death from self-harm among veterans

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[1]University of Alabama; [2]University of South Alabama; [3]America's Warrior Partnership; [4]Charleston Southern University; [5]University of Rochester; [6]University of Rochester

Introduction: *Operation Deep Dive,* funded by the Bristol-Myers Squibb Foundation, conducted by America's Warrior Partnership (AWP) and The University of Alabama (UA), seeks to better understand the interplay between individual, organizational, and community risk factors leading to suicides and early mortality due to self-harm among all those who have served in our armed forces. We are using a 4-year, mixed-methods, Community-Based Participatory Research (CBPR) model. For this presentation we will discuss developments from Phase: 1) current knowledge of sociocultural aspects of suicide, especially those applicable to veteran suicides, 2) lessons regarding challenges/ issues of engaging with communities and Medical Examiner/Coroner offices, 3) present progress on/findings from a 2-year retrospective examination of veteran suicides, and 4) present the development of methods for the *sociocultural autopsy*, a variant of the traditional psychological autopsy that incorporates expanded social and community factors relevant to a veteran's community trajectory (social networks, involvement with organizations, place of residence, use of local services - veteran or otherwise, etc.).

Methodology: Phase 1 (Year 1) uses a CBPR approach in 7 AWP-affiliated US communities. We will discuss recruitment of Community Advisory Boards (CABs), outcomes an updated systematic literature review (specific approach under development) regarding sociocultural risk factors, community engagement with veterans, and military to civilian transition (MCT), and the recruitment of 7 non-AWP communities with similar demographics for **Phase 2** (Years 2-4) comparison sites.

Results: Literature review results will be presented, as will a description of each community and its veteran population and related services. We will present progress on a 2-year retrospective determination of the # and causes of veteran suicides in each community. This review will use ME/Coroner records, information from the community, Department of Defense (DOD) data individuals' service records and Veterans Affairs (VA) data on health/mental health services. These deaths will be geo-mapped to determine different geo-cultural contexts or specific geographic locations that affect the likelihood of suicide.

Conclusion: The data will explore the impact of military discharge status on the suicide among former veterans, the relationship between military service experience and suicide, and the suicide rate among veterans who are not receiving VA services. Our community partners will play an active role in developing community support, energy, and success of this initiative. This data will be quantitatively and qualitatively evaluated at the county level from an academic, psychological, clinical, socio-cultural, and geo-spatial lens. Results may result in improved effectiveness for veteran suicide prevention efforts.

2C02: Re-establishment to Career, Home and Community: The critical forgotten factor of successful veterans transition

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Introduction: Focus on "re-establishment" of veterans will improve mental and physical health and conditions for veterans and families. Historical experience demonstrates that re-education, re-training, and re-employment to reinforce a sense of purpose and citizenship reduced the need for long-term compensation and solved a multitude of ills, when combined with temporary income support and grants for housing and entrepreneurial investments so as to "re-establish" veterans (Gregg, 1948). These foundational principles, delivered in a systematic manner, have been replaced with a patchwork insurance regime to "rehabilitate" spread across Federal and Provincial jurisdictions and even dispersed within Federal departments. A concerted effort to re-employ veterans has been replaced with ad hoc efforts, which have not been a priority. Additionally, previous transition programs benefitted from a society that understood the value of military service and had popular exemplars of veteran success; that is no longer the case.

Methodology: Historical analysis of veterans' transition programs, results, and successful transition case studies, compared to current veteran transition experience. An examination of the foundational principles of the Veterans Charter created for World War II, but based on adverse experience from World War I, demonstrates the importance of return to work as a means to ensure successful transition for disabled and able-bodied alike. Overviews of case studies of veterans (Gregg, Hoffmeister, Pearson, Hobbs, etc.) to demonstrate results and to validate the veteran value proposition to counter stigma. Subsequent research will examine entire unit cohorts. Contrast of the formal and informal efforts of re-establishment after World War II to current efforts. Examination of current Veterans Hiring Programs at Canadian based multi-nationals.

Results: "A number of disciplines study concrete obstacles to successful transition; however relatively little has been published about intangible systemic obstacles." (English, Dale-McGrath, 2013). Veterans experience difficulty partly due to the lack of sense of purpose. (Belanger, 2012). Successful World War II programs prioritized re-establishment and return to self-reliance over compensation. (Neary, Granatstein, 1998; Keshen, 2004; Neary 2011). Re-establishment provides a sense of purpose. After World War II, Canadian public policy priority shifted from "re-establishment" to "insurance". The peace dividend ended with Somalia, Yugoslavia, and Afghanistan but re-establishment did not return as a priority (Pedlar, Thompson, 2011). Failure to prioritize "re-establishment" is a significant intangible obstacle (Veterans Transition Advisory Council, 2017).

Conclusion: Successful veterans' transition has not been extensively studied. New primary and secondary research reveals that re-establishment is critical to transition success (Morton, Wright, 1987). Re-establishment should return as a priority.

2C03: Communities Serve: A systematic review of need assessments on U.S. veteran and military-connected family populations

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Syracuse University

Introduction: Military veterans and their families face a multiplicity of challenges once they transition from service, from education barriers to homelessness. As American private and public-sector organizations have become more engaged on this issue, many have published need assessments on the veteran and military family populations in their respective geographic areas to inform and drive service delivery. This systematic review summarizes findings on veterans' issues from across the U.S., highlighting gaps within the existing literature, and provides recommendations for strengthening future veteran needs assessments.

Methodology: A literature search on veterans' need assessments in the United States was conducted on scholarly and U.S. Federal Government databases using ISI Web of Science, ProQuest, Scopus, JSTOR, Google, and the U.S. Departments of Defense, Labor, Veterans Affairs, and the Small Business Administration. We used the key search terms *veteran, military,* and *need assessment*, in addition to related terms regarding the U.S. veteran and military population. Studies meeting the inclusion criteria were subject to a rigorous qualitative coding process based on PRISMA guidelines involving multiple reviewers and input from expert scholars of veterans' issues. Finally, we analyzed the coded data according to the eighteen topics areas selected, ranging from education to homelessness.

Results: A total of 61 relevant studies and publications were identified which met the study criteria. Veterans across the United States reported difficulties in accessing VA health and benefit services, particularly for women's and mental health needs. Women veterans face a unique set of challenges with regards to employment, health, housing, and military sexual trauma. Although issues of mental health, employment, and homelessness among veterans have generally improved, veterans still suffer from cultural stigmas associated with PTSD & military service, and from high living costs. We found that the veterans' issues literature tends to underrepresent certain veteran sub-groups and particularly the poor, ethnic and gender minorities, military children, and National Guard/Reserve members in its studies. Similarly, the literature focuses heavily on major cities but did not include studies in over a third of U.S. states.

Conclusion: The need assessment literature points to inequities among states, sub-groups, and issues of study which impairs effective and targeted service delivery for veterans and their families in the U.S. Public and nonprofit organizations should work to design policies and modes of service delivery which improves access to services and address the unique needs of minority and women veterans and those living in rural areas.

3C01: Chronic Conditions in Veterans: Life After Service Studies 2016

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Veterans Affairs Canada

Introduction: The Life After Service (LASS) program of research is designed to enhance understanding of the transition from military to civilian life. LASS 2016 is the most recent of these studies, and includes Veterans' health status for many chronic conditions.

Methodology: LASS 2016 included a telephone survey conducted by Statistics Canada of Regular Force Veterans released from 1998 to 2015. The study had a 73% response rate, and utilized the 91% who agreed to share their data with Veterans Affairs Canada (n=2,755). Cross-sectional weighted data was used in the analysis, to account for the stratified design and incorporate sources of potential bias. Comparisons of health status indicators were made to Canadians using age-sex adjusted rates and 95% confidence intervals.

Results: Regular Force Veterans reported double the prevalence for several chronic conditions, compared to Canadians. These include arthritis (29% vs. 14%), depression (20% vs. 8%), and anxiety (15% vs. 6%). Post-traumatic stress disorder was reported by 14% of Regular Force Veterans, compared to 2% of Canadians. Regular Force Veterans reported similar prevalence of other chronic conditions, compared to Canadians, including diabetes (7%), asthma (6%), heart disease (5%), and Chronic Obstructive Pulmonary Disease (3%).

Conclusion: The higher prevalence of several chronic conditions among Regular Force Veterans compared to Canadians is evidence for the need for supports specific to Veteran needs. Details of their characteristics can provide direction for programming to meet these needs, and ultimately improve the health and well-being of Veterans in Canada.

3C04: Profile of Female and Male Veterans in Canada

MacLean, Mary Beth, MA; Clow, Barbara, PhD; Ralling, Alexandra, BSc; Sweet, Jill, MA; *Poirier, Alain, OCAD; Pound, Teresa, BSc; Buss, Jason, MSc; Rodd, Bronwyn, MA; MacKinnon, Allan, MBA

Veterans Affairs Canada

Introduction: In Canada, females account for 15% of the estimated Veteran population of 670,000 and constitute a larger proportion of reserve force Veterans compared to regular force Veterans. Sex- and gender-based analysis (SGBA) is essential in designing appropriate and inclusive policies, and planning effective and cost-effective programs and services. An important step in this type of analysis is an examination of differences and similarities in populations by sex.

Methodology: This study uses the Life After Service Studies 2010, 2013, and 2016 surveys and income tax record linkage data covering Veterans released since 1998, to disaggregate demographic, service characteristics, and well-being indicators by sex. Over 40 indicators were examined by sex across seven domains of well-being: health, purpose, finances, life skills, social integration, housing and physical environment, and culture and social environment. VAC program data (2015-16) for Canadian Armed Forces (CAF) and war service (WS) Veterans, and their survivor(s), by program was disaggregated by sex. Programs included disability, low income and health care benefits, as well as, rehabilitation and related financial benefits.

Results: In 2016, while females accounted for 15% of the overall Veteran population in Canada, only 10% were in receipt of benefits from VAC, 14% compared to 9% among CAF Veterans and 17% compared to 12% among WS Veterans. However, female Veterans were more likely to participate in rehabilitation, related earnings loss benefits, low income benefits and long-term care.

Females were more likely to have been in administrative, medical, and transferable occupations at release, to have been medically released, to need help with activity limitations, have seen a doctor, be hospitalized, to have been diagnosed with mental health condition, to work part-time, to experience low income and have larger reductions in income post-release. Females were less likely to be working, to be satisfied with their main activity, and to agree that their military skills were transferable to their civilian work.

Conclusion: Male and female Veterans differed in demographic and military service characteristics and well-being. Females were worse off compared to males in the domains of health, purpose, and finances. Overall, female Veterans were underrepresented as clients of VAC, however, among more recently released Veterans female reserve force Veterans were more likely to be clients than males. These differences have implications for policy and program design, as well as for further research.

3C06: Measuring the Well-being of Veterans

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Veterans Affairs Canada

Introduction: Based on a Veteran well-being construct (2016) and the Well-being Surveillance Framework (2017), Veterans Affairs Canada (VAC) has begun to report on Veteran well-being with a focus on policy implications. An accepted set of high-level indicators were identified which are being used to report on the well-being of the Veteran population. Analysis of these indicators over time, using data from the Life After Service Studies (LASS) and other sources, will allow VAC to understand trends and identify areas where Veterans are facing challenges and where gaps exist. The evidence will focus on the policy implications and will inform VAC's policy and research priorities.

Methodology: The majority of data used in this analysis comes from the three cycles of the LASS (2010, 2013 and 2016). The outcome is a report on the findings with respect to the well-being of the Canadian Veteran population based on the measurement of an accepted set of high level indicators.

Results: Results of this analysis will focus on the well-being of Veterans in the seven domains and will include similarities and differences that exist between men and women and between service types.

Conclusion: Veteran well-being will be measured and trends in well-being identified leading to evidence-based decision making, sound policy development, improved effectiveness of VAC programs, and ultimately the improved well-being of Veterans and their families.

5C03: Post-traumatic Stress Disorder is not Associated with Bronchodilator Response in Post-9/11 Veterans

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Introduction: Several studies support an association between post-traumatic stress disorder (PTSD) and asthma in a variety of settings. Both conditions have been reported following combat deployment to Iraq and Afghanistan (post-9/11), but their relationship in this cohort remains unknown. The goal of the present study was to determine the relationship between probable PTSD and an objective marker of clinical and subclinical asthma – i.e., bronchodilator response (BDR).

Methodology: 188 post-9/11 veterans (40.0±9.9 years; 16.5% female) referred to our clinic for post-deployment health concerns completed spirometry testing before and after a bronchodilator. BDR was defined as an improvement of ≥12% and 200 mL in forced expiratory volume in one second (FEV1) or forced vital capacity (FVC) after bronchodilator administration. Probable PTSD was defined as a score ≥ 50 on the PTSD Checklist questionnaire (PCL-C). PTSD symptom domain burden was calculated separately for each of three domains: "re-experiencing" (possible range 5-25), "avoidance" (range 7-35), and "increased arousal" (range 5-25) by summing the relevant items from the PCL-C. Multivariable logistic regression was used to determine the relationship of probable PTSD and BDR with adjustment for age, sex, body mass index, and smoking pack-years. Bivariate associations between PTSD symptom domain burden and bronchodilator response (% change for FEV1 and FVC) were also tested with Pearson's correlation coefficients.

Results: Among the 188 post-9/11 veterans, 61.7% had probable PTSD and 20.2% had a BDR. PTSD symptom domain burden scores for re-experiencing, avoidance and increased arousal were 14.3±6.0, 21.8±8.4, and 18.3±5.6, respectively. Probable PTSD was not associated with BDR (adjusted odds ratio = 1.11, 95% confidence interval = 0.53 – 2.32). None of the three PTSD symptom domain burden scores were associated with bronchodilator responsiveness of FEV1 (r = -0.099 to -0.062, all p values > 0.17) or FVC (r = -0.063 to -0.042, all p values > 0.39).

Conclusion: In contrast to reports in the literature of PTSD being associated with symptoms of asthma, in our specialty clinic sample of post-9/11 veterans exposed to combat, probable PTSD was not associated with BDR. Evaluation of separate PTSD symptom domain burden scores also did not reveal any association with objective measures of BDR. Clinicians should utilize objective measures of lung function when evaluating cardiopulmonary symptoms in combat veterans with PTSD.

Poster Presentations

P144: Epidemiological Studies of the Porton Down Veterans: A ten-year update of mortality and cancer incidence, 2005-2014

Venables, Katherine, MD[1]; Carpenter, Lucy, PhD[1]; Keegan, Thomas, PhD[2]; Brooks, Claire, MSc[1]; Archer, Gemma, PhD[3]; Fear, Nicola, PhD[3]; Sharp, Marie-Louise, PhD[3]; *Gribble, Rachael, PhD[3]

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Introduction: The health effects of chemical warfare agents are of public interest because the agents continue to be deployed, e.g. in Syr-

ia, and in Salisbury, England. Although the immediate toxic effects of these agents are well-known, the long-term health outcomes after low level exposure are unclear. Studies set in war zones or after terrorist incidents are subject to biases and uncertainties. We will study mortality and cancer in a cohort whose exposures are low, but well-documented.

Methodology: Our study will be set within the Porton Down Veterans Cohort, set up in 2003. It consists of 18,276 men who, while serving in the UK armed forces, took part in 1941-89 in the 'human volunteer programme' of chemical warfare agent research at Porton Down. Their exposure(s) at Porton Down were abstracted (Keegan et al. Ann Occup Hyg 2009;53:83-97). A comparison cohort of 17,600 other servicemen was assembled and both cohorts were followed until 2004. The Porton Down Veterans had no overall excess of cancer compared to other veterans (Carpenter et al. BMJ 2009;338:b655). They had a 6% excess of all-cause mortality which could not be attributed to any specific exposure at Porton Down (Venables et al. BMJ 2009;338:b613). We will update follow-up to 2014.

Results: We estimate, based on the age structure of the veterans, and the national population age-specific mortality rates, that there will be an additional approximately 8,000 new deaths from both cohorts combined, making a total of about 22,200 deaths for analysis, greatly increasing the study's statistical power. A proportionate number of additional cancer registrations is expected. Plans for the study are under way. Funding has been obtained from the Medical Research Council (MR/R002932/1) and the necessary research ethics and data access permissions are being sought.

Conclusion: This update to the Porton Down Veterans cohort study will enable us to examine mortality and cancer incidence after low-dose chemical warfare agent exposure in more detail than heretofore and also to explore new questions that have arisen since the original study results were published.

P154: Service Animal Legislation in Canada

Gillett, James, PhD

McMaster University

Introduction: Veterans who use service animals to assist with their care and activities in their daily life are protected by legislation that ensures access to public and private spaces normally off limits to animals. Without such legislation, daily necessities like shopping, transportation, and employment would be impossible for veterans who rely on a service animal. This presentation analyzes the development of service animal legislation, current similarities and differences across provinces, and the implications of the current laws for veterans with service animals.

Methodology: This research uses a comparative legal research methodology. With this approach, legislation from different jurisdictions across a specific issue or problem is compared in relation to a series of related factors. In this study, the legislation pertaining to service dog use is compared across four dimensions: (1) the functionality of the legislation; (2) the structural components of the legislation; (3) the conceptual foundations underlying the legislation; and (4) the historical development of the legislation. This methodology is valuable when contrasting laws across legal jurisdictions. It allows for an in-depth analysis of laws pertaining to the use of service dog across provinces.

Results: Currently, all provinces in Canada have laws pertaining to the use of service animals. Even though each provincial legislation addresses a similar issue - that being protecting the rights of individuals who rely upon a service animal - across jurisdictions the laws are quite different. Key differences in the legislation include the structure of the law itself, the key function or objective that the law is meant to achieve, and its conceptual basis (for instance, the definition of 'service' or how it is demonstrated or proven). The difference across legislation is related to their unique historical development within distinct provincial social contexts.

Conclusion: The legal landscape of service animal legislation in Canada is quickly changing. There is an increase in the use of service animals to assist people with disabilities. In the case of veterans with PTSD and other types of mental and physical disabilities, laws governing the use of service animals is essential for their care and ability to function. The lives of veterans and their service animals could be improved with further research into ways of improving and making more consistent the legal frameworks used in Canada in this area. This research could serve as the evidence base from which to make informed decisions about reforming laws pertaining to service animal use across provinces.