

ABSTRACTS

2022

RÉSUMÉS



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HEALTH SERVICES

Podium Presentations

2D03: Supporting Military Families with Special Needs in Accessing Support Services: Building capacity for military family resource centres to provide equitable supports and services

Bourgoin, Orлана, MEd¹; Keith, Erin, EdD¹; Hill, Shannon, MEd²; Cramm, Heidi, PhD²

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Introduction: Canadian military families who have children with special needs can experience a myriad of barriers when trying to access specialized support services. Military lifestyle factors, such as frequent relocation, separation, and transitions, directly impact families' abilities to access needed services. Military Family Resource Centres (MFRCs) support military families navigating these unique challenges. However, as a charitable non-profit organization, each MFRC is unique and offers programs and services special to the population they serve based on their location and community. This research explores opportunities and constraints for MFRCs to work more collaboratively with each other in supporting military families with special needs to access support services equitably.

Methods: A reflexive narrative methodology was used through a critical lens as the qualitative approach. A systematic literature review was conducted, drawn from various sources, including but not limited to JSTOR, CIMVHR, Google Scholar, and publicly published data on the Military Family Services and MFRCs websites within the last 5 to 7 years. In addition to publicly accessible policy and program documents from MFRCs across Canada. The SPIDER tool provided focus and ensured critical areas of interest were included. A conceptual framework was created to categorize the results into four key areas of focus: Collaboration, Continuity of Care, Provincial Framework, and Increased Support.

Results: The search yielded 30 peer-reviewed sources; 13 Canadian-specific studies, 19 specific to military families, 4 MFRC specific documents and 10 specific to leadership styles and collaboration; Findings highlight four key challenges and barriers experienced by military families with special needs upon relocation: Collaboration, Continuity of Care, Provincial Framework, and Increased Support. Increased collaborative communication is needed to enable the creation of a program that supports interagency referrals and follows CAF families as they are posted across the country and abroad, coupled with consistency and accountability enacted through a special needs specialist "point-person" at each MFRC providing case management services to families in their community. Enhanced collaboration between MFRCs and community agencies can increase service provisions, decrease waitlists, provide evidence-based programs

to supplement gaps in services, and raise awareness of military families' unique and challenging lifestyles special needs.

Conclusions: The combination of relocations, separation, and risk creates continual stressors that directly impact the health and education continuity, accessibility, and quality of care for military families; there is a need to better understand how they amplify the challenges of families with special needs. MFRCs play a crucial role in providing equitable support to military families with special needs in accessing support services. This research will be valuable to leaders working in MFRCs to determine ways to enhance their ability to equitably assist military families with special needs in accessing the services they need.

PRIMARILY MENTAL HEALTH & WELL-BEING

Podium Presentations

2D01: Enhancing Post-traumatic Growth in a Couples Post-traumatic Stress Disorder Intervention: A qualitative analysis of couples' and therapists' successes and challenges

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Introduction: Post-traumatic growth (PTG) refers to the development of positive changes following exposure to trauma and focuses on three major domains: a greater sense of personal strength, changes in personal relationships, and a recognition of new possibilities or paths for one's life. Only a few studies have reported on the development of PTG during post-traumatic stress disorder (PTSD) therapy. Trauma-focused cognitive behavioral therapy (CBT) has been found to facilitate growth, and an increase in PTG has been found to be associated with a decrease in PTSD. However, there is a need to better understand PTG as a treatment goal and the ways it is developed and manifested in PTSD therapies. The current presentation focuses on a qualitative analysis of PTG content in sessions of cognitive-behavioral conjoint therapy (CBCT) in Israel. The study examines the manifestation of PTG in couples' reports, and the challenges faced by both therapists and clients in conceptualizing and promoting PTG.

Methods: Participants were 14 heterosexual dyads who received CBCT for PTSD at Bar-Ilan University in Israel. One member of each dyad had PTSD following a range of traumatic events. Participant ages ranged between 24 and 71. Participants were treated with CBCT for PTSD. This treatment protocol is a 15-session couples' therapy designed to treat PTSD and enhance relationship functioning (Monson

& Fredman, 2012). Qualitative analysis of Session 14, which focuses on the potential for individual and couple-level PTG, and Session 15, which starts with a review of the out-of-session assignments regarding PTG, was systematically preformed.

Expected Results: Our findings supported the three major domains of PTG mentioned in the literature. In addition, they documented a new perspective on living with PTSD. Regarding partner's roles, the first role was validating the partner's PTG. The second partner's role was in helping to point out positive changes in the partner's PTG. This role became especially evident when one of the partners had difficulty in locating such changes, but not only then. Some clients and therapists struggled with holding the distress and PTG simultaneously. Clients worried that if they talked about PTG, then their distress would be dismissed. Therapists seemed to be apologetic about bringing up PTG in a context meant to be about minimizing distress.

Conclusions: Special attention must be given to addressing both PTSD and PTG, for couples as well as for therapists. Supervision should include an awareness of therapists' perceptions of PTG and the factors that facilitate it.

3D02: Young Children's Experiences of Parental Deployment within Australian Defence Force Families

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Introduction: Children from Australian Defence Force (ADF) families experience frequent and lengthy parent absences due to deployment and training episodes. This can cause a range of responses in young children, including regressions as they respond to family stresses and transitions. Globally, research about how children experience and understand parental deployment had been limited to secondary data from parents and occasionally interactions with high school and primary school students. To address this gap, my PhD research entitled 'Young children's experiences and understandings within an ADF family' sought to listen directly to 2-5-year-old children's voices within these families.

Methods: Mosaic and narrative approaches were employed to co-construct data and privilege young children's voices that had been previously marginalised within the literature. Data was collected with 11 families, representing 19 children, with six of the children used for in-depth case studies. These families represented three geographical states and four military bases. Children's voices were gathered through informal chats, conversations, art and craftwork, puppet and role play, observations, rhymes and raps, and children's photographs. The study also listened to parent's and educator's voices as sources of knowledge and to assist with interpretation of the children's data and by sharing family photographs. Thematic

and narrative analysis was employed to analyse the data, then a socio-ecological framework was applied.

Results: This presentation examines children's experiences of parental deployment. These included: stressors and responses, ongoing and frequent transitions, family mobility, their own responses to parental deployment, other family members responses to deployment, increased family stress, parental fatigue, family role flexibility, and various forms of communication with the absent parent. The children also experienced protective factors within their socio-ecological microsystem and exosystem, family narratives, meta-narratives within the military and broader community, ritual and acculturation, development of coping strategies, and models for individual and family resilience.

Conclusions: Recommendations for the ADF, educators and family workers have been presented in a thesis and journal publications. They have been used by organisations to inform policies and support impacting ADF families with young children. Significantly, the findings have acted as a catalyst to gain funding, build and evaluate free, online, research-based early childhood resources. These resources assist parents, early childhood educators and family workers to address the impacts of these experiences and support young children's understanding of Australian military family life. These findings will be of interest to other researchers wanting to research with young children from military families.

3D03: Understanding the School Transition Experiences of Adolescents Living in Canadian Military Families

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Introduction: Frequent relocation has been documented as the most distinguishable feature of the military lifestyle. In 2017, an estimated 10,000 Regular Force families relocated within Canada, 8,000 of whom relocated to new provinces or territories. With each move, military families must transition their children between schools and educational systems. With each new move, military-connected students may experience curricular gaps and/or redundancies, disruptions to friendships, and missed opportunities to participate in extracurricular activities. For adolescents, these challenges may become particularly amplified. To date, the American research has provided the foundation for what is known about the school transition experiences among military-connected students. Given key contextual differences that exist between the United States and Canada, as well as current limitations with Canadian data, it is unclear to what extent the American findings are representative of the Canadian experience. Informed by an

ecological school transition framework (Rous et al., 2007), a larger qualitative study is being conducted to understand and support the school transition experiences of adolescents living in Canadian military families. This presentation will report on the adolescent findings from Phase One.

Methods: Phase One of the study is guided by interpretative phenomenological analysis (IPA). Using a demographic survey and semi-structured interviews, data were collected from ten adolescents. Three participants identified as male, while seven participants identified as female. Seven adolescents experienced an interprovincial school transition, while three adolescents relocated intraprovincially. While six adolescents were formally diagnosed with a special need, five of these adolescents had an individualized education plan (IEP) that offered school-based accommodations.

Expected Results: Guided by a six-step IPA framework, three main themes emerged from the data: (1) school transitions for military-connected adolescents are easier when their social transition is quick; (2) interprovincial relocations can amplify academic challenges; and (3) there is a need for increased educator awareness about the military lifestyle, particularly within communities that have a smaller military presence.

Conclusions: Aligning with the priorities outlined in *Strong, Secure, Engaged*, which include improving supports and services offered to Canadian military families during times of relocation, this study is both timely and meaningful. Given the lack of Canadian data that currently exists, this study will make significant contributions across academic, military, and educational sectors.

3D04: Mental Health and Risk-taking Behaviours among Canadian Youth in Military-connected Families: A cross-sectional study

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Introduction: Children and youth in military-connected families are exposed to a unique triad of factors that coincide with parental military occupation and lifestyle during their development that may negatively impact their mental health and wellbeing. However, there is a lack of evidence about their health, health behaviours, and wellbeing in Canada, especially for adolescents. The objective of this study was to compare the mental health, life satisfaction and risk-taking behaviour between youth in military and non-military connected families in a contemporary sample of young people.

Methods: This cross-sectional study used health and wellbeing data from the 2017/18 Canadian sample of the

Health Behaviour in School-aged Children survey, a nationally representative survey of school-attending youth in grades 6–10. Questionnaires administered in classroom settings collected information about parental service in the military and indicators of wellbeing, hopelessness, emotional problems, prosocial behaviour, low life satisfaction, and overt risk-taking behaviours. Multivariable Poisson regression models estimated the association between military family connection and each indicator, accounting for survey weights and clustering by school. Effect modification by grade and sex was investigated.

Results: This study included 16,737 students; 9.5% reported having a parent and/or guardian in the Canadian military. After adjusting for grade, sex and family affluence, youth with a family connection to the military were 28% more likely to report low wellbeing (95% CI 1.17-1.40), 32% more likely to report persistent hopelessness (95% CI 1.22-1.43), 22% more likely to report emotional problems (95% CI 1.13-1.32), 42% more likely to report low life satisfaction (95% CI 1.27-1.59), and 37% more likely to report overt risk-taking (95% CI 1.21-1.55). However, youth with a family connection to the military were as likely to engage in prosocial behaviour (RR 1.00 (0.92-1.09)). The association between being connected to the military and low wellbeing was stronger in younger students (grades 6 to 8) compared to students in grades 9 to 10. The associations between being connected to the military and negative mental health were generally similar in boys and girls.

Conclusions: Youth in military-connected families reported worse mental health and greater engagement in risk-taking behaviours than youth in non-military connected families. The results indicate a need for additional supports to improve the mental health and wellbeing of youth in Canadian military-connected families. We also observed similar rates of prosocial behaviour for youth in military-connected families, suggesting normal socioemotional development despite the increased risks of emotional and behavioural problems.

3D05: The Creation and Evaluation of Young Children's Research-based Programs and Resources to Support Strengths and Build Resilience in Australian Military and Veteran Families

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Program/Intervention Description: Until 2021, resources for young children from Australian Defence Force families, and their parents, educators and family workers were scarce, meaning these potentially vulnerable children were not being properly supported. Research revealed the lack of age and culturally appropriate resources meant parents felt alone and unsupported. Early childhood educators struggled to adapt resources designed for older children. Philanthropic and university funding allowed

the creation of free, research-based online resources for young children (2-8 years), their parents, educators, and family workers called the 'Early Childhood Defence Programs'. These were written using a Creative Commons licence in partnership with an expert Steering Committee, including military parents, family workers, veterans, and educators who support or have supported children from military families, and education and psychology researchers. The program features learning modules and research-based children's storybooks. Before a formal evaluation, academic peers, and experts in the field read and edited the draft resources.

Evaluation Methods: The programs have been evaluated by volunteer civilian parents whose partners were military or veteran members, educators and family workers using a mixed-methods approach. Participants were recruited through social media, news media stories and emails. Online surveys were used to measure participants' self-rated knowledge, confidence and competence when supporting children from defence or veteran families. Participants were able to provide anecdotal information about children's engagement with the resources and any changes they recommended. Additionally, other partner organisations that support military families in Australia and internationally were invited to view the resources for potential use.

Results: While 350 participant registrations to date are encouraging, engagement in both the before and after surveys is disappointingly low (under 50), meaning they are not statistically significant. Research occurred during the COVID-19 pandemic, which affected families, early childhood educators and family workers. However, overwhelmingly, the evaluations are positive and show a very significant improvement in participants' knowledge, confidence and competence. The suggestions for improvement have been useful, including ways to make the online resources user-friendly, and ways to update and adapt terminology. Additionally, organisations have requested permission to link our resources on their site and have invited further collaboration.

Conclusions: By now, the research team was hoping for more evaluative data but the use of experts when writing and editing the programs potentially reduced these. The evaluations have improved the programs before public release. Significantly, organisations that support military families want to use these resources that use a strengths-based, resilience-based approach to support these potentially vulnerable children.

5D01: PSPNET Families—Developing an evidence-based virtual well-being hub for families of public safety personnel

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¹Queen's University

Introduction: While there are an increasing number

of resources available to Public Safety Personnel (PSP) experiencing mental health impacts, PSP organizations and families have few family-centred, trauma-informed mental health prevention resources that have been developed with the culturally competent lenses of occupational risk and requirement. PSP sectors have ranked PSP families resources as missing, highly important, and necessary.

Methods: In response to this priority, we are developing an evidence-based virtual wellbeing hub for families of PSP, PSPNET Families. This project will connect the benefits of population health promotion/prevention approaches to PSP families wellbeing. We draw on universal design to integrate a response-to-intervention approach to shape primary, secondary, and tertiary prevention resources designed to meet the needs of PSP families. This responsive continuum of resources will embed a spiral curriculum design that incorporates an accessible, primary layer of mental health promotion and psychoeducation for adult family members acknowledging the commonly shared occupational requirements of PSP families. Secondary prevention supports will focus on the emotional and relational consequences of those occupational risks and requirements for PSP couples. Tertiary prevention will offer a self-directed internet-delivered cognitive behavioural (iCBT) intervention for significant others and spouses of PSP to improve wellbeing among those who are seeking a low intensity individual intervention.

Using framework analysis, we emerged a conceptual model organized around unique PSP families lifestyle demands—steady exposure to erratic and dynamic schedules and potentially psychologically traumatic events, coupled with protective and disruptive impacts on family identity and community belonging. These anchors provide contextual resonance while enabling fluidity across levels of prevention, regardless of where users enter the wellbeing hub. Development of primary and secondary prevention material is guided by a significant amount of evidence synthesis, consultation with an international team of families researchers, and research with family members with lived experience. The tertiary prevention material is based on further adaptation of evidence-based programming adapted for and evaluated with PSP.

Expected Results: A developmental evaluation of PSPNET Families will be conducted through independent users' activities will be tracked via google analytics, and users will be invited to complete surveys assessing the navigability, reliability, and usefulness of the content.

Conclusions: PSPNET Families bridges extant and emergent evidence to create a state-of-the-art wellbeing hub for families, whose day to day lives are shaped by the occupational risks and requirements of their loved ones being "on the job".

Ongoing evaluation will inform future iterations and policy and programming to redress identified gaps.

5D02: Exploring the Occupational Lifestyle Experiences of the Families of Public Safety Personnel

Richmond, Rachel, PhD(Cand)¹; Norris, Deborah, PhD²; Mahar, Alyson, PhD³; MacDermid, Joy, PhD⁴; Dekel, Rachel, PhD⁵; Cramm, Heidi, PhD¹

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Introduction: Public safety personnel (PSP) are regularly exposed to physical and psychological risks. Despite recent attention on operational stress injuries among these personnel, there has been considerably less attention paid to the ongoing ways in which the risks and requirements associated with these occupations impact family life, and correspondingly, how families respond and adapt to these lifestyle factors. This review sought to identify and describe the experiences of families of public safety personnel as they navigate through the occupational risks and requirements of public safety work.

Methods: This qualitative systematic review was conducted in accordance with the Joanna Briggs Institute methodology for systematic reviews of qualitative evidence. Six databases (Embase, MEDLINE, Web of Sciences, CINAHL, PsycINFO, and Sociological Abstracts) were searched with the consultation of librarians to identify qualitative studies written in English that examined the experiences of PSP family members. All returns were entered into Covidence where duplicates were removed. Two screeners independently screened first by title/abstract, then for full text against the inclusion/exclusion criteria, and finally conducted a critical appraisal of all included studies. Any conflict was discussed and resolved in group settings. Data extraction was completed by RR in MAXQDA and discussed with HC and RD to establish rigour. A meta-aggregation approach was then used to synthesize and analyze the data.

Results: From 17121 retrieved articles, 17 were included in the analysis from 2005 to 2021 originating from six countries, with the majority from the USA. Familial data were primarily from female heterosexual partners of male PSP, with only three including the voice of PSP children. Despite searching for five public safety sectors, qualitative data from the family was only present for police, paramedic, and firefighter sectors, resulting in no representation from corrections or communicator families. This presentation will explain the main lifestyle factors that impact PSP families and the strategies they implement to cope.

Conclusions: The occupational risks and requirements of PSP spill over into the home and impact families. By identifying and synthesizing these experiences across public safety sectors, a first step has been taken to understand these families. Next

steps in this area should involve confirming and deepening the understanding of the experiences of these public safety families and developing programs and resources to address their specific needs. More research needs to concentrate on underrepresented populations such as correctional and communicator families as well as children, as these voices are still rarely present and not yet understood.

5D03: Public Safety Personnel Family Resilience: A narrative review

Cox, Marilyn, MA¹; Norris, Deborah, PhD²; Cramm, Heidi, PhD¹; Richmond, Rachel, MA¹; Anderson, Gregory, PhD³

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Introduction: The families of public safety personnel (PSP) are unique from the general population given that they must adapt to the many demands associated with PSP careers such as shiftwork, trauma exposure, and dangerous work environments. Research on the effect of these cumulative demands on PSP has received increased attention but less is known about the experiences of families. The primary goal of this review was to synthesize and explore existing research to identify what is unique about PSP families and develop an understanding of the relationship between work demands and family processes. The narrative review was a means to summarize and interpret a diverse body of literature on PSP families and a synthesis from the military family resiliency literature was used to interpret the findings. It has served to identify significant gaps in the literature where research is needed.

Methods: A narrative review allowed the research team to address a diverse body of literature on PSP families that incorporated a variety of research methods from different disciplines. Articles were selected based on keyword searches in 15 databases and imported into MAXQDA for further analysis. Fifty-four articles met inclusion criteria and were coded to map major themes. Thematic analysis facilitated the interpretation, merging, and reframing of the evidence.

Results: A synthesis for military family resilience was adapted for PSP families which addressed the contextual factors of structural interference, emotional interference, and risk of PSP injury. The prominent issues associated with each of these factors identified in the literature were summarized and interpreted. Meaning-making, collaboration, a sense of coherence, and communication were identified as themes associated with intrafamilial processes. Extrafamilial themes included public perceptions, a lack of recognition for family roles, and the need for information and education for PSP families.

Conclusions: The interdependence of PSP family members and the availability of social support are intrafamilial factors

that enhance family capabilities; however, there is also a need for PS organizations and communities to be cognizant of the variability and vulnerability of PSP families and provide extrafamilial support. A more comprehensive body of research representative of all PSP sectors focused on the relational aspects of resilience is needed to advance an appreciation of the demands and capabilities within the context of PSP families to inform intervention strategies.

6D01: Evaluation of a Family Psychoeducation for Military Veteran Families

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Program/Intervention Description: Operational stress injuries (OSIs), including post-traumatic stress disorder (PTSD), are prevalent among (military) Veterans, and the effects are experienced in their families too. The development of evidence-based services for families of Veterans with OSIs is critical, partly because family functioning both affects and is affected by OSIs. Few such programs have been implemented, however, particularly in Canada, and those that have are not scientifically evaluated. Research suggests that brief systems-focused family psychoeducation is useful in the treatment of OSIs, e.g., leading to increases in targeted PTSD knowledge and skills and enhancing resilience. In 2021, a family psychoeducation online group intervention was piloted with Veterans and their families receiving clinical care by a specialized publicly funded mental health clinic. The purpose of this intervention was to enhance resilience for Veterans and their families who are experiencing OSIs, using a systems focused approach targeting couples.

Evaluation Methods: This qualitative study evaluated pre and post intervention resilience using dyadic semi-structured de novo interviews with couples (n=7 dyads). Phenomenological thematic analysis of pre- and post-intervention interviews was facilitated using MAXQDA software. Research ethics approval was obtained.

Results: The results demonstrated themes compatible with resilience theory: *bouncing forward* (i.e., personal growth after adversity) or *bouncing back* (i.e., returning to pre-adversity functioning). Pre-intervention thematic analysis demonstrated 4 primary themes framed through bouncing back and 3 primary themes framed through bouncing forward. Themes of demonstrating resilience as bouncing back included low self-efficacy, barriers to communication, emotional dysregulation, and lack of social supports. Pre-intervention themes that supported participants in bouncing forward included rock bottom as a motivator for change, social support, and professional support. Post-intervention findings

were that resilience was seen in themes of bouncing forward and included high self-efficacy, improved communication, and emotional regulation. Additional themes related to intervention content and delivery included new knowledge and resources, the importance of relationships in care, logistics, and target audience. The evaluation demonstrated a change in pre- and post-intervention resilience, with an increase in participants' behaviours and beliefs that supported them and their perceived ability to bounce forward after experiencing adversity.

Conclusions: This study demonstrates the success of systems-focused psychoeducation and helps emphasize the relevance and importance of ongoing development of innovative care that addresses the needs of Veterans and their family members.

6D02: A Systematic Review of Suicidality amongst Military Family Members: Prevalence and Associated Factors

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Introduction: Suicide is a public health concern for all Canadians, including Canadian Armed Forces personnel (past and present). In Canada and the United States, there has been increased prevalence of suicidality in active-duty military personnel and veterans in comparison to the general population. Suicidality involves thoughts (i.e., ideation), behaviours (e.g., attempts, self-harm/injury), and death by suicide. Often, family is seen as a protective factor against suicidal ideation in military personnel and Veterans, however, less attention has been paid to suicidality among military and veteran family members, such as spouses, partners and children. To date no systematic review has focused on suicidality in military and Veteran families. The aims of this systematic review are to: 1) identify and evaluate literature associated with rate and prevalence of suicidality in military or Veteran families as well as any mediating or associative factors available; and 2) identify gaps in the literature informing recommendations for future suicide prevention and intervention research.

Methods: A systematic search was conducted in CINAHL, MEDLINE, PubMed, Embase, Web of Sciences, PsycINFO, and Sociological Abstracts in English using database-specific subject headings and keywords related to suicidality, military/Veteran, and families. Original research published in English from January 2007 to February 2022 were independently appraised, and data extracted, by two reviewers. The JBI Quality Assessment Tools were used to assess methodological quality and bias.

Expected Results: Twenty-two studies met the inclusion criteria. Thirteen studies reported on prevalence/rate and/or associative factors of suicide in children of military or Veterans, and nine focused on military spouses. Sixteen studies were rated at strong, four at moderate, and two were weak level of evidence. This study is currently underway; therefore, prevalence/ rate and mediating or associative factors will be reported in the upcoming months.

Conclusions: This is the first systematic review of research investigating the prevalence/rate of suicide in military family members. The intention of this study is to serve as a guide for future research and programming for military families.

6D04: An In-depth Qualitative Approach to the Psychosocial Determinants of Health and Well-being for Veteran Families in the United Kingdom: Preliminary results from the United Kingdom Veterans Family Study

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Introduction: International literature concerning the psychological health of veterans families focuses on negative psychological outcomes of family members as a consequence of the veteran's PTSD or other psychological distress. Conversely, there is minimal research regarding psychological outcomes in families of UK veterans and how the psychological health and wellbeing of veteran families is determined by psychosocial factors. This study was devised in order to understand how the local community contributes to veteran families' psychological health and wellbeing, how families access, or are barred from accessing support for their needs, and to identify the likely future needs of veteran families living in the UK.

Methods: Fifty-one semi-structured (of a planned 80) interviews were conducted with spouses/intimate partners of veterans ($n = 29$), and adult children of veterans ($n = 22$). Participants were recruited with advertisements through veterans' family support services and charities, and on social media. Transcribed interviews were analysed with an inductive approach under a thematic framework of three main themes: support, wellbeing, and current and future needs.

Expected Results: Under the theme of support, participants identified five subthemes: 1) family and friends as the main source of support, 2) lack of availability of bespoke/relevant services, 3) barriers to initially reaching out to services, 4) difficulty in accessing relevant services, and 5) perceptions of poor service quality. Regarding wellbeing, participants identified and discussed nine life domains that were impacted: health, relationships, social integration, employment, education, housing, finances, life skills, and values. Current and

future needs were identified as falling into two subthemes: emotional needs, and practical needs.

Conclusions: The psychological health and wellbeing of veterans families is established by a complex relationship between support, wellbeing, and need. Whilst the mental health of the veteran may be an important contributory factor, families of veterans in the UK experience a number of psychosocial determinants. The results of this study contribute to closing the knowledge gap concerning psychological outcomes in UK veteran families, and could be implicated in improving programs and initiatives that support veteran families across the UK.

6D05: Strongest Families Institute: A qualitative and quantitative review of eMental Health services to support military, Veterans and their families

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Program/Intervention Description: Military and Veteran families (MVF) share distinctive military cultural connections through common life experiences and transitions including frequent relocations, regular absences from loved ones and living with the persistent risk of injury or death of family members. These unique lifestyle conditions place MVF members at risk for mental health decline, especially during the pandemic. With the growing need for mental health services, MVFs need timely access to evidence-based programs, with embedded military cultural competency. Although advances have been made to provide health professionals with military-specific competency model supporting work with MVF in Canada, competency within programs continue to be limited. Strongest Families Institute (SFI) provides MVF with evidence-based mental health services targeting child behavioural challenges, and anxiety and depression challenges experienced by children, youth, and adults. SFI telephone support coaches receive military cultural competency training via its military associated staff, to customize care meeting the MVF needs including pandemic adaptations and companion app development (providing program skills, regardless of location/wireless connection). SFI has helped about 800 MVFs (including OUTCAN families) and is an example of how eMental Health services can and have been meeting the mental health needs of the MVF community.

Evaluation Methods: SFI collects data through its proprietary eplatform IRIS, facilitating data collection to assess overall effectiveness, also feasibility as a long-term COVID-19 recovery solution. SFI uses several validated outcome measures pre and post-intervention, and other metrics to report on impacts, adherence, and satisfaction. Analysis will include effect size reports and family stories.

Results: SFI's innovation demonstrates improvement in mental health and well-being of MVF including improved family relationships and parental stress. SFI statistics for MVF show 92% outcome success rate in overcoming presenting problems, 6% attrition rate and high client satisfaction. Data analysis is pending and will include reports on effect size demonstrating impact on several domains. SFI's commitment to provide family-centric care, offers a continuum of wrap-around support for families from children to youth to caregivers (adult anxiety and depression – ICAN program). Feedback indicates ICAN has been particularly helpful to MVF, especially the OUTCAN community and families impacted by COVID-19.

Conclusions: Uptake and utilization of SFI services by MVF over the past eight years demonstrate need, with over 800 referrals from across Canada/OUTCAN. The outcome success and high satisfaction ratings both with programming and suggests program acceptability, convenience, and effectiveness. Equipping MVFs with evidence-based skills to manage their unique challenges, leading to long term mental wellness and resilience.

6D06: Resilient Parents...Resilient Communities: A three-year mixed methods implementation study to build family-centred resilience in serving military, Veterans and their families

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Introduction: A new vision is championed by the Canadian Armed Forces and Veterans Affairs Canada to build resilience in military members and retired Canadian Veterans, and their families (MF). Our team tested two made-in-Canada, bilingual, evidence-based, resilience-building programmes at the Edmonton Military Family Resource Centre (MFRC) to good effect. Based on the positive response from MF and their service providers, our team is keen on supporting the expansion of resilience-building programming. The overarching aim of this research is to co-design a pan-Canadian military family-centred resilience-building programme that builds community capacity and sustains resilience-building programming with four specific objectives: (1) Understand the evidence and landscape in Canada on military family-centred resilience-building programme facilitators and barriers to implement an evidence-based programme that builds resilience in MF (Year 1); (2) Prioritize facilitators, barriers and solutions to co-design a programme implementation plan, and inform military family-friendly policy (Years 1, 2); (3) Evaluate the programme implementation on a local scale for impact in MF and service providers (Years 2, 3) and; (4) Expand or scale up the military family-centred resilience-building programme on a national scale to facilitate pan-Canadian community resilience-building hubs (Year 3).

Methods: Our research approach will be founded in collective community impact and participatory action research. To help advance this vision, we will work with MF, service providers and leaders in decision- and policy-making from government and non-government organizations–MFRCs, community and other military organizations– with interest in family-centred resilience-building throughout a three-year research project. Purposive/snowball sampling will be applied to counter sampling bias, and ensure diverse perspectives in sex, gender, urban/rural, age, role, years of experience/service, discipline, child/youth age, sex, gender, neurodiversity. Using interviews, focus groups, surveys and World/Conversation Cafés, our study will draw on the evidence and insights from English- and French-speaking stakeholders. Qualitative data analysis will happen before quantitative data analysis, and both will help determine the elements of resilience-building programme implementation.

Expected Results: This study will uniquely contribute to family resilience by determining relevant solutions for the implementation of military family-centred resilience-building programming across Canada. Left unaddressed, military life adversities may continue to impede the fulfillment, health and wellness of MF, and limit the widespread community capacity in tailoring resilience-building programming to MF.

Conclusions: Implementing a pan-Canadian family-centred resilience-building programme with MFRCs as hubs will strengthen community resilience in delivering an evidence-based programme, in turn informing military family-centred decision- and policy-making.

Poster Presentations

P101: Understanding Available Support for Public Safety Family Members

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Introduction: Public safety personnel (PSP) are regularly exposed to physical and psychological risks at their job, and this has been shown to spill over into their family domain. As a result, conflicts often arise in the lives of PSP – in their jobs and in their families. The purpose of this study was to conduct a systematic review regarding the families of PSP, and the ways in which they are shaped by the operational risks associated with PSP professions.

Methods: A systematic review was conducted search in six databases (Embase, MEDLINE, Web of Sciences, CINAHL, PsychINFO, and Sociological Abstracts) with the consultation of librarians, for the literature relating to public safety families

from the perspective of the PSP across five sectors (fire, corrections, police, paramedics, and communications). Two screeners independently screened first by title/abstract, then for full text against the inclusion/exclusion criteria, and finally conducted a critical appraisal of all included studies. Any conflict was discussed and resolved in group settings. Included studies were analyzed using a meta-aggregation method where applicable, and categorized as 'factors', 'actors', and 'impactors' based on familial presence. Factor studies described family constructs distal to the PSP. Actor studies described situations in which the family were involved to help their PSP. Impactor studies had families as the key beneficiaries of the study.

Results: Of the 17121 results, fifty studies were included ranging from 1979 to 2021, with 43 were published after 2000. They came from 14 countries, with the majority originating from the USA. Of the five targeted sectors, half of the included studies were of police, 12 corrections, six fire, three paramedic, four multi-sector, and no representation from the communication sector. Nineteen studies were categorized with family being 'factors', 21 categorized with family being 'actors', and 10 with family members being 'impactors'.

Conclusions: Though families are included in many studies, family members are often not the key beneficiaries. Family members are often thought of as an 'other' (a factor), or are expected to help their PS family member. Family members are often considered as separate from the PSP and the public safety organizations, and often have little support for their own health and well-being. Next steps in this field should focus on improving the well-being of public safety family members themselves.

P102: Supporting the School Transition Experiences of Adolescents Living in Canadian Military Families: A Parent Perspective

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Introduction: Military families relocate three times more frequently than their civilian counterparts. Each relocation requires military families to re-establish essential services such as healthcare, spousal employment, and schooling. While research advancements have been made within Canada across the first two sectors, experiences faced by Canadian military families when relocating and transitioning their children between schools and education systems remains relatively unknown. American research indicates that military-connected students can face curricular gaps and/or redundancies, disruptions to friendships, and missed opportunities to participate in extracurricular activities. These challenges can become particularly amplified for adolescents. While providing the

foundation for what is known about the educational experiences of military-connected students and their families, key contextual differences between the United States and Canada, as well as a lack of Canadian data, make it unclear how representative the American findings are of the Canadian experience. Informed by an ecological school transition framework (Rous et al., 2007), a larger qualitative study is being conducted to better understand and support the school transition experiences of adolescents living in Canadian military families. This presentation will report on the parent findings from Phase One.

Methods: Phase One of the larger qualitative study is guided by interpretative phenomenological analysis (IPA). Data were collected from ten parents using a demographic survey and semi-structured interviews. Two participants identified as male, while eight participants identified as female. Six participants relocated interprovincially, while four participants relocated intraprovincially. Four participants were the serving member within their families, while six participants were non-serving members. Two participants lived in dual-serving families, while other participants lived in families with one serving member. Six participants had adolescents with special needs, five of whom had individualized education plans (IEP).

Expected Results: Guided by a six-step IPA framework, four preliminary themes have emerged from the data analysis: (1) parents try to actively involve their adolescent(s) in the relocation and school transition process; (2) parents place a large emphasis on supporting the social transition of their adolescent(s); (3) school transitions at the high school level can be more challenging to support than at the elementary school level; and (4) parents can experience greater challenges supporting their adolescents through a school transition within communities that have a smaller military presence.

Conclusions: This study aligns with the priorities outlined in *Strong, Secure, Engaged*, which include improving supports and services offered to Canadian military families during times of relocation.

P103: Challenges to Coparenting Posed by Military Life and Strategies Used by Fathers and Mothers to Overcome Them

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Introduction: Studies have sought to understand military family functioning through different systems such as the marital and the parent-child relationships. Yet another important family system, the coparenting relationship, has scarcely been studied in military families, much less Canadian ones. Recent studies have examined the impact of deployment on families and coparenting. They have focused on the

division of labour, which is but one component of the broader coparenting relationship (Feinberg, 2003). The present study aims to provide a broader understanding of coparenting in Canadian military families headed by a military father and a civilian mother. Its objectives are to: 1) explore the presence of military life in mothers and fathers discourse on coparenting in military families; 2) describe the challenges specific demands of military life poses for different components of the coparenting relationship; 3) explore how the strategies used may enhance or hinder the quality of the coparenting relationship.

Methods: Thirty participants from families headed by military fathers and civilian mothers (15 fathers and 15 mothers) were recruited through Facebook advertisements shared by MFRC across Canada and University e-mail lists. Participants completed an online questionnaire before taking part in a semi-structured interview (90-120 minutes) during which they were asked to talk about coparenting in their family. Interview questions explored the four components of Feinberg's (2003) model of coparenting. A qualitative thematic coding of interview transcripts was used to attain the three research objectives. Quantitative scores on the Coparenting Relationship Scale (CRS), completed in the online questionnaire, were also considered in a mixed-method analysis.

Results: Mothers and fathers expose a complex coparenting experience, describing a variety of challenges. Demands of military life are evoked, but fathers' and mothers' discourse on coparenting predominantly addresses issues any family might face. Nevertheless, military life does appear to pose particular challenges for two coparenting components: division of labour and joint management of the family. Challenges converge with those reported in prior research for other family systems. Strategies adopted to meet these challenges relate to 1) father involvement, 2) communication, 3) coparenting dynamics and 4) parents' own thoughts and perceptions. Strategies generally seek to enhance coparental collaboration, although tag-team or mother-centered strategies are used.

Conclusions: Military fathers and civilian mothers report experiencing several challenges to their coparenting relationship, some relate to specific demands of military life. Strategies adopted which generally seem to enhance coparental collaboration, although they may sometimes suspend it or set it aside.

P104: Coparenting Across Periods of Prolonged Absence of a Military Parent

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Introduction: Having a parent who is an active member of the

military presents many unique challenges for families with young children. Prolonged absences from home of the military parent rank among the main challenges (Manser, 2018; 2020). Studies have examined the effects of these absences on the parent-child and marital relationships, however, little attention has been paid to their implications for the coparental relationship. This study aims to: (1) describe the coparenting challenges experienced by military families with young children over the cycle of a prolonged absence; (2) distinguish strategies employed to meet these challenges that do and do not contribute to maintaining the coparenting relationship and (3) compare military fathers and civilian mothers' experience of these challenges and strategies.

Methods: Twenty-seven participants (13 military fathers and 14 civilian mothers) from heterosexual military families with at least one child (12 years or younger) during a prolonged absence of the military parent were recruited by advertisements shared on Facebook, by CRFM across Canada and through University email distribution lists. Conducted by videoconference, the second portion of the 90 to 120 minutes individual semi structured interview, inspired by the critical incident technique, explores coparenting challenges over the cycle of a specific prolonged absence. Guided by Feinberg's (2003) coparenting definition, a qualitative thematic analysis of interview verbatims was carried out to identify the coparenting challenges experienced by mothers and fathers and the strategies they used. Similarities and distinctions in the experience of military fathers and civilian mothers are considered.

Results: Military fathers and civilian mothers reported multiple and interconnected challenges. Three challenges categories emerged; challenges related to the child, to domestic and parental tasks and to the connection between military fathers and family. Mothers and fathers reported diverse strategies involving one parent, two parents or external resources. They also identified factors that complicate coparenting challenges and strategies through the prolonged absence cycle such as parent's health, communication obstacles and military context.

Conclusions: Fathers and mothers reported similar coparenting challenges related to the child, the tasks or the connection between fathers and family, sometimes depicting different sides of the same challenge. Strategies may involve one, two parents or external sources, thus suspending or sustaining the coparenting relationship. Although assuming different positions over a period of absence, mothers and fathers both express the difficulty of maintaining the coparental relationship through the cycle of prolonged absence while expressing the desire and importance for them to do so.

P105: Coparenting in Military Families : An ecological and family systems analysis

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Introduction: The coparenting relationship pertains to how parents work together to ensure the well-being and development of their child. Bronfenbrenner's ecological systems theory, family systems theory, and the Military Family Fitness Model suggest this relationship between parents is tied to other components and systems of the family (individual, parent-child, marital), as well as broader social-environmental factors. Recent research (e.g. DeVoe et al., 2019) suggest that military life may pose unique challenges to the coparenting relationship. This study aims to: 1) describe fathers and mothers in military families' perceptions of their coparenting relationship; 2) examine how military life stressors, family life and health concerns may account for the quality of the coparenting relationship; 3) examine associations between coparenting, marital and parental relationships; 4) determine if these associations differ as a function of respondents' gender and military or civilian status.

Methods: Parents of families which included at least one military parent and a child of 12 years or younger completed an online questionnaire advertised through Facebook by MFRC across Canada and University e-mail lists. Participants include 48 military fathers, 41 military mothers and 70 civilian mothers (n=159). Questionnaires included measures of the quality of their coparenting relationship (Feinberg, Brown & Kan, 2012), marital satisfaction, parental stress, as well as questions about children, prolonged absences (e.g. deployments, training), relocations, as well as own and partners' mental and physical health.

Results: The vast majority of parents give very positive accounts of their coparenting relationship. The quality of the coparenting relationship is only weakly associated with the number and length of prolonged absences of military parents, the number of relocations and child characteristics. However, it is strongly associated with parents' report of the quality of their own and their partners' mental and physical health, their parental stress and, unsurprisingly, their marital satisfaction. With the exception of military fathers' more positive endorsement of their partners' parenting compared to military and civilian mothers, no other significant gender or military/civilian differences were found.

Conclusions: Although faced with various challenges of military life, military fathers and mothers, as well as civilian mothers similarly report supportive and collaborative coparenting relationships with their partners. Consistent with ecological and family systems theory, a better coparenting relationship is associated with parents' mental and physical health, lower parental stress and greater marital satisfaction. The quality of coparenting may be affected by but also influence other family systems, thus potentially key to family well-being.

P106: How Military and Veteran Families have been Included in Suicidality and Suicide Prevention Research: The Factors, Actors, and Impactors modelling

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Introduction: This presentation will discuss how military and Veteran families have been conceptualized within suicidality (i.e., suicidal thoughts and behaviours) and suicide prevention research. The impacts of suicidality on families are well known, which is particularly relevant in at-risk populations, such as military personnel and Veteran communities. Yet, to date, it is unclear how military and Veteran families have been considered and included in suicidality and suicide prevention research. Suicide prevention involves a range of interventions from universal awareness strategies to crisis interventions through to postvention.

Methods: This presentation is based on a scoping review conducted in accordance with the Joanna Briggs Institute in 2022. Studies were included if the research objectives and findings related to the key concepts of suicidality, military/Veterans, and family/social support. A systematic search was conducted in CINAHL, MEDLINE, PubMed, Embase, Web of Sciences, PsycINFO, and Sociological Abstracts in English using database-specific subject headings and keywords. All included studies underwent quality assessment. *Bibliographic, participant, methodological, and family-relevant* data was extracted and descriptively analyzed. Further grounded theory analysis allowed for a conceptual categorization of the included studies into *Factors, Actors, and Impactors*.

Results: In total 51 international studies published between 2007 and 2021 met inclusion criteria. *Factor* studies described family constructs as a suicidality risk or protective factor for military personnel or Veterans. *Actor* studies described families' roles or responsibilities to act or intervene in relation to the suicidality of military personnel or Veterans. *Impactor* studies described the impacts of suicidality on military and Veteran family members. Most studies focused on suicidality rather than suicide prevention.

Conclusions: This is the first in-depth, rigorously-conducted review to examine existing evidence of suicidality in, and suicide prevention strategies for, military and Veteran family members. Despite emerging evidence of increased suicidality within this population, there were few evaluative studies of focused on intervening with military or Veteran family members as a target population. Family was typically considered in periphery to the needs of a military personnel or Veteran experiencing suicidality. Given the demonstrated

suicide risks to this population, more research on current interventions and emerging best practices would act to advance the field. It would also provide stronger guidance for health services, military institutions, and military family organizations regarding feasible and useful resources, programs, and standard practices.

P107: The Experiences of Families and Friends of Invictus Games Participants: An interpretative phenomenological analysis

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Introduction: The Invictus Games are a rehabilitative sports competition for injured and/or ill serving members and veterans. While the Invictus Games' mandate is to support the competitors, their families, and the general public, research to date has primarily focused on the competitors media coverage, stress, and participation, largely ignoring other focal populations. This project builds on the lived experiences of families of Invictus Games participants through a work-family conflict lens (Pleck, 1977). The work-family conflict theoretical lens emphasizes the opportunity cost associated with the time and energy resources that, once invested, preclude dedication to other tasks, while also highlighting the supports from family and work which can alleviate the tension.

Methods: This qualitative project was informed by the interpretive/constructivist paradigm, which assumes that there are multiple experiences and perspectives of a given phenomenon. Participants were recruited through social media and contacts of the researchers. Semi-structured interviews were conducted with participants who were asked to describe work-family conflict in their lived experience as family members and friends of Invictus Games athletes from Canada, the United Kingdom, and Australia. Data collection procedures and analysis followed an interpretative phenomenological analysis (IPA) approach.

Results: Following the analysis of interviews with family members (n = 5) and a friend (n = 1), four themes emerged: treatment of families; mutuality of experiences; life-changing event; and community of understanding. These themes describe the family experience and draw attention to the crucial part that families play in all stages as support and encouragement to the competitor, but also the journey that families take on their own and with the competitor. While these findings reveal the experiences of family members of Invictus Games competitors, they also challenge the understanding of work-family conflict and sports participation. Here, the introduction of the Invictus Games provided an opportunity for families to come together again and heal through opportunities for reconnection, as opposed to sport being a strain on the family system.

Conclusions: The findings from this broaden the lens by which family involvement in the Invictus Games is understood by adding a theoretical component while maintaining focus on the family experience. Future work can build off this project to develop programs and policies which support meaningful family participation in military-connected adaptive sports programs throughout the entire process.

P108: Improving Patient Wellness and Support in Rural Areas Through Virtual Resiliency Training: A framework for providing resiliency training to anyone, anywhere

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Program/Intervention Description: The COVID-19 pandemic has highlighted significant impacts of stress, unpredictable environments and isolation on mental health. Additionally, limited access to healthcare services and mental health resources, can further exacerbate stress and mental health conditions. An environmental scan in Alberta identified that rural dwellers were more likely to experience financial strain, isolation, mental health challenges, and gaps in access to healthcare related to geographic limitations. In this study, we recruited rural participants to attend an online virtual course called STRIVE: Simulated Training for Resilience in Various Environments. STRIVE was previously researched with Cumming School of Medicine medical students in 2018 and is now included in many residency programs across the country. STRIVE is based on the Road to Mental Readiness and reinforced with simulation training and debriefing. The goal of the course is to teach coping strategies that will be helpful during stressful situations. This research study sought to assess applicability and benefit for patients, given the known benefit to healthcare professionals.

Evaluation Methods: Two sessions (2hours) of the course were conducted via Zoom. Participants learned mindfulness-based stress management/resiliency skills and then watched video-based simulated scenarios where they were asked to assess which skills may help them navigate the stressful scenario. The discussions were conducted using a debriefing model that fostered a safe and non judgemental environment. Surveys were administered before and after the STRIVE course to evaluate the effectiveness of the training.

Results: Thirty-eight participants completed pre-/post-session surveys. We used matched samples t-tests and Wilcoxon Signed Ranks tests to analyze the data. Results showed that after the training, attendees had increased confidence in recognizing stress and burnout in themselves and peers. They also felt more comfortable in responding

to stressful situations. Participants noted in free-form comments that rural inhabitants often have stressors that are different from urban residents, such as high turnover of medical practitioners, stigma, and traveling long distances for appointments.

Conclusions: Stress and mental health conditions in rural inhabitants can be risk factors for a reduced quality of life. Our study results indicate that practicing mindfulness-based stress management techniques could help improve mental health and resiliency in patients. We deduce this framework could support any population with similar challenges as everyone will be a patient at some point in time. Being a patient is reflective of being a Canadian. Ideally, one with access to medical care. This virtual approach may be beneficial during the current COVID-19 pandemic and into the future.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

1D01: On Solid Ground: Applying theoretical frameworks to develop an evidence-informed program for spouses in public safety personnel families

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Program/Intervention Description: Public safety personnel (PSP) experience a number of potentially traumatic operational stressors within their duties (Berger et al., 2012) and spouses are often the first to step in to support their partner's mental health, sometimes at the detriment to their own mental wellbeing (Casas & Benuto, 2021). As such, many spouses report experiencing problems with their own social and emotional health as a result of the stressors associated with being in a PSP family (e.g., Casas & Benuto, 2021; Davidson et al., 2006; Landers et al., 2020). However, outside of more general mental health services, specific programs and services that understand the context of PSP families and the unique needs of family members are not common. Therefore, we have developed a program to support the unique needs of spouses in PSP families.

Evaluation Methods: Family systems (Jackson, 1957) and the Couple Adaptation to Traumatic Stress (CATS; Goff & Smith, 2005) models both indicate reciprocal influence of family members and provide rationale for meeting the needs of each family member. In addition, Cognitive Behavioural Interpersonal theory (Monson et al., 2010) indicates that caretaking

behaviours (i.e., accommodation) can promote avoidance behaviours which leads to caregiver burnout, increases the risk of the PSP member developing PTSD, and negatively impacts relationship satisfaction. Together, each of these theories describe the importance of utilizing a systemic approach to expand focus on simply supporting the at-risk patient (i.e., in this case, the PSP member), but also to consider the well-being and functioning of individuals that surround the member.

Results: Based on the contextual experiences of PSP spouses (e.g., Casas & Benuto, 2021) and previous influential theories, we have developed the Family Adaptation Model (FAM), which is a novel application of Hans Selye's (1936) General Adaptation Syndrome. This FAM model illustrates the processes by which families experience a stressor (alarm phase), PSP spouses adapt to the stressor and support their PSP member by expanding roles and responsibilities (resistance phase), and sometimes maintain these re-distributed roles and responsibilities to the extent they experience exhaustion and burnout (exhaustion phase).

Conclusions: The main aim of the program is to improve the well-being of the spouse/partner and to create powerful distinctions between accommodation and appropriate support behaviours to reduce burnout and improve relationship satisfaction. This presentation will discuss the background theory, describe our FAM model in detail, and outline the structure and content of our evidence-informed Family First Responder program.

1D02: Measuring What Matters: Family First Responder Spouse/Partner Pilot Program pre and post-testing of stress, mental health, and family functioning

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Program/Intervention Description: Public safety personnel (PSP), including police officers, paramedics, and firefighters, are at increased risk for mental disorders due to their frequent exposure to potentially traumatic events (i.e., operational stressors; Carleton et al., 2018). The implications of these stressors extend to the families of PSP; spouses often carry the brunt of the responsibility for supporting the PSP member and the family (Carleton et al., 2019; Casas & Benuto, 2021). Extant literature demonstrates that spouses also experience problems with their own mental health (e.g., Landers et al., 2020), and request services for their own needs (Galovski & Lyons, 2004). It is expected that the psychoeducation and support received by partners over the course of the FFR pilot program will impact the self-reported functioning of partners as it relates to stress, mental health, and family functioning.

Evaluation Methods: As per the preceding papers describing

the theoretical and methodological foundations, the Family First Responder (FFR) Partner pilot program will be delivered virtually over five weeks to groups of 4-8 spouses/partners of first responders (police, fire, paramedic). Partners ($N = 20-24$) participating in the FFR Partner pilot study will complete a series of questionnaires one week prior to the start of the first session, immediately following the conclusion of the last session, and at one-month follow-up. Quasi-experimental design methods (pre/post-test) will be used to evaluate the impact of the FFR pilot program, delivered virtually, on the primary outcome, operational stress, via the Post-traumatic Stress Disorder (PTSD) Checklist for DSM-5 (PCL-5; Weathers et al., 2013) and the Depression, Anxiety & Stress Scales (DASS-21; Lovibond & Lovibond, 1995). Secondary outcomes include family functioning (assessed via FACES IV; Olsen et al., 2006) and Flanagan Quality of Life Scale (QOLS; Flanagan, 1978; 1982).

Results: All data analyses will be completed in SPSS and R Studio. We will use multilevel modeling (MLM) to examine the psychosocial and physiological functioning of the spouses/partners and how this functioning is influenced by participation in FFR Partner pilot program. As our central focus of this research is on the psychosocial and physiological functioning of partner, our statistical model is comprised of the psychosocial and physiological functioning of individual PSP via self-reported mental health symptoms and the bio-physical stress-level (i.e., wearable).

Conclusions: It is anticipated that participation in the FFR Partner pilot program will significantly reduce self-reported stress, negative symptoms of mental health problems (i.e., depression, anxiety), and improve facets of family functioning (i.e., communication, adaptation).

1D03: The Partners Speak: Qualitative analysis of participant experiences and outcomes from the Family First Responder Pilot Program

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Program/Intervention Description: Qualitative methodologies, when paired with quantitative research in intervention assessment, are commonly employed in a limited capacity, to simply understand the feasibility and acceptability of the study content or delivery (O’Cathain, et al., 2013; Thiessen, et al., 2022). This approach overlooks the strength of qualitative research to uncover not only what happens, but also the how and why elements of social processes and behaviours. Robust qualitative research and intentional integration of qualitative and quantitative results increases the depth of understanding about outcomes, or how the intervention relates to first responder family functioning.

Evaluation Methods: The interpretive description

methodology used in this study seeks to bridge theoretical integrity and real-world application through interpretation and sense-making of the phenomenon being investigated (Thorne, Reimer & MacDonald-Emes, 1997). This moves qualitative analysis beyond mere description by building from specific observations toward broader patterns in data gathered in post-program focus groups. Focus group participants were recruited from first responder spouse/partner participants who completed the Family First Responder Partner pilot program. Two members of the research team, who were not involved in the delivery of the intervention, will moderate each conversation. Focus group conversations will be recorded and transcribed. Transcript-based analysis alongside field notes of the moderators will employ the constant-comparative analysis (Glaser & Strauss, 1967) through a process of open-coding and mapping of themes and subthemes.

Results: The Family First Responder intervention delivers psychoeducation, skills, and strategies for coping, and mutual aid to help families mitigate and cope with the effects of operational stress that accompany the first responder role. Exploring the observable patterns of human experience, the ways in which the program has affected their family functioning, creates a better understanding of not only the strengths and limitations of the pilot program, but also how to optimize its impact for the subsequent phases of research.

Conclusions: The Family First Responder Partner program seeks to alleviate the effects of operational stressors that accompany the role of first responder for both the PSP member and their family members. A pilot study evaluation that includes research methodologies and an integrative approach to analysis delivers a more detailed understanding of program effectiveness to optimize program content and delivery.

1D04: Setting the Stage: Describing the methodology, technology, and learner management system used in the Family First Responder Partner Pilot Program

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Program/Intervention Description: First responder families require unique support, and traditional in-person support models are inadequate for the challenge. Virtual delivery of evidence-informed programs will undoubtedly enhance accessibility and make them more attractive and likely to be adopted by our community partners under real and emerging economic and budgetary constraints. Building on the theoretical and clinical framework of Paper 1, Paper 2 will focus on the methodology, technology, and learner management system that will be tested in the Family First Responder (FFR) partner pilot study.

Evaluation Methods: Sample: Spouses or co-habiting

life partners of PSPs (referred to collectively as “partners”), living in Alberta, Saskatchewan, and Ontario will be invited to participate in the FFR pilot study ($N = 20-24$). In order for partners to participate, their PSP member must: a) be currently employed full-time as a firefighter, paramedic, or police officer in Alberta, Saskatchewan, or Ontario; b) not currently be on sick or disability leave; and c) have been employed for 12 months or more. Spouses must also currently be living with their PSP member and their PSP member must also be willing to participate in the study by completing baseline, post-intervention, and follow-up questionnaires.

Web-based Program Delivery: The FFR web-based platform and mobile applications that are currently being co-designed using user-centered (i.e., program facilitators and PSP partners) and agile software development approaches. The video-enabled web-based platform will enable psychologists and licensed social workers to deliver the psychoeducation and support program to PSP family members in two ways: (1) synchronously - online group sessions; and (2) asynchronously - integrated learning management system (LMS).

Wearable Technology: Integration of wearable technologies into the virtual delivery system and mobile applications (smartwatch and mobile phone) will allow researchers to collect biometric data from Garmin smartwatch worn by partners to measure all-day daily activity (i.e., HR, steps, and sleep metrics) combined for proxy measure of stress. Wearable data will be stored on the We-TRAC Citizen Scientist portal housed at the U of C for analysis.

Results: The virtual platform is currently in development and beta (pilot) testing of the virtual program is planned for late Spring 2022. Preliminary biometric results will be presented.

Conclusions: First responder partners in the FFR pilot study will be the first to participate in a virtually-delivered psychoeducation and support program that utilizes a novel learner management system. In addition to pre/post self-report measures (Paper 3), biometric data on changes in physiological functioning are novel to the program.

2D02: Two are Better than One: The contribution of dyadic coping to the marital satisfaction of combat commanders and their wives

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Introduction: Combat commander couples in Israel contend with demanding, unusual, and difficult conditions, from ongoing absences from home to emergency/life-threatening situations. Dyadic coping refers to the wide variety of ways in which spouses may mutually engage in coping with stressful situations. In order to better understand the needs of combat commander couples, the current study examined:

a) Differences in the level of dyadic coping and marital satisfaction among Israeli combat commanders and their spouses, and b) The contribution of an individual's dyadic coping style – positive (e.g., empathic understanding and sharing of feelings) or negative (e.g., hostile, ambivalent, or superficial responses) – to their own marital satisfaction (actor effect) and to their partner's marital satisfaction (partner effect).

Methods: The sample comprised 248 male combat commanders in the Israel Defense Forces (IDF) and their female partners. The research questionnaires were sent by e-mail only after obtaining the consent of both spouses, who were also offered the option of asking additional questions and receiving mental-health assistance if needed. Combat commanders' and partners' assessments of dyadic coping were measured using the dyadic coping inventory (DCI), and marital satisfaction was measured using the ENRICH marital satisfaction scale. Dyadic analysis applying the actor-partner interdependence model (APIM) was used.

Results: Contrary to the expectation that women would more frequently use positive dyadic coping styles, no significant differences were found in the levels of dyadic coping or marital satisfaction among combat commanders and their spouses. Actor and partner effects of positive dyadic coping were associated with better marital satisfaction, but actor effects were stronger. Actor and partner effects of negative dyadic coping were associated with less marital satisfaction, but there was no difference between them. Also, the longer the marital relationship, the significantly lower the positive dyadic coping of the combat commander.

Conclusions: Overall, this study adds to the current knowledge regarding outcomes between service members and their spouses by examining Dyadic Coping as a key process to promoting couples marital satisfaction. Considering that the military context is highly demanding for service members and their families, it is important to continue research on other supportive behaviors in order to expand the possibilities of mutual assistance to promote better coping.

3D01: A Profile of Canadian Military-connected Youth in Schools across Canada

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Introduction: Youth in military-connected families experience several transitions related to their parents' careers, such as deployments, relocations, and the military-to-civilian transition, alongside changes in the family and in their own development. Very little is known about youth in Canadian military-connected families, and less heard from the youth themselves. The objective of this study was to describe key

characteristics and indicators about youth in Canadian military families as captured by the Health Behaviour in School-aged Children survey.

Methods: This was a descriptive study using data from the 2017/18 Canadian sample of the Health Behaviour in School-aged Children survey, a nationally representative sample of school-attending youth in grades 6–10. Questionnaires were administered in classroom settings and completed by youth themselves. We report on characteristics of youth in military-connected families, including their connection to their families, their sense of belonging to their schools, and their overall health and wellness information. Descriptive statistics are presented as frequencies and percentages for categorical data, as well as medians and interquartile ranges for continuous data. Stratified output is also available by age, sex, and school grade.

Results: Across the country, 1794 school-attending youth reported having a parent or guardian who currently serves or previously served in the Canadian Armed Forces military. The average age was 13.8 years and 52% reported being male; 1.9% reported that neither female nor male best described their sex. About 80% reported they were in good or excellent health and on average they scored a 7/10 for life satisfaction. Family composition varied, with 65% including both a mother and a father and 17.5% a mother only. Almost 68% reported they agreed with the statement that their parents/guardians understood them, and 73% reported agreeing with the statement that they had a happy home life. Two thirds liked their school either a bit or a lot; fewer than one in ten students disagreed with the statement that their teacher accepted them. Over half participated in organized team sports, 40% in organized individual sports, and one third in arts groups, with 23% involved with a church, religious or spiritual group.

Conclusions: Hearing from Canadian military-connected youth is important in its own right. The information from this survey may be used by schools, program leaders, policy makers, and others who are engaged in supporting healthy development for youth in Canadian military families and their families.

4D01: Understanding How Pain Unfolds within Veteran Families: Harnessing the voices of Veterans, spouses, and their children

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Introduction: Chronic pain and associated mental health issues (i.e., symptoms of posttraumatic stress disorder [PTSD], anxiety, depression, insomnia, and substance use) are alarmingly prevalent in veterans, likely placing their children at heightened risk for the development of pain problems that can persist into adulthood. Only one US-based study has examined the offspring of veterans, revealing that risks for headaches

were high and tended to worsen over time for younger children. There is a critical need for empirical research to characterize and establish the prevalence of pain in children of Canadian veterans and understand the mechanisms underlying the intergenerational risk for transmission of chronic pain. The current study aim was to gain an in-depth understanding of the pain experience of CAF members/veterans and their children.

Methods: CAF members/veterans enrolled in any of the military elements (i.e., sea, land, air) after 1975 were eligible to participate. Their child was eligible if they are between 10 and 40 years old. Parent-child dyads are required to participate together. To date, 6 Veterans, 3 spouses, and 11 youth have completed semi-structured interviews by phone or to explore their experiences of pain, as it unfolds in a family context. Interpretive phenomenological analysis was conducted to uncover overarching themes.

Expected Results: Data collection and analysis is ongoing; preliminary themes are described in turn. Initial coding has brought forth themes related to i) protective behaviors (with emphasis on protectiveness of parents by children), ii) a military and familial culture of stoicism, iii) military mindset as changing the anchors of pain, and iv) pushing through the pain. Findings suggest that children of CAF members and Veterans engage in protective behaviors toward their parents and Veterans and their children experience real and tangible threats when expressing pain and injury. Transition from military service to civilian life represents a critical period during which pain and mental health issues within families can be acutely present. Military culture and identity create a unique context within which pain expression and experience is integrally shaped within families.

Conclusions: This project provides opportunity to better understand the experiences of chronic pain within Veteran families, which can help us to minimize challenges faced by families and break the intergenerational cycle of pain and mental health concerns.

4D02: Intergenerational Transmission of Chronic Pain in Canadian Veterans and their Children

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¹University of Calgary; ²Chronic Pain Centre of Excellence for Canadian Veterans

Introduction: Chronic pain and mental health issues are alarmingly prevalent in Veterans, likely placing their children at heightened risk for the development of pain problems. Nevertheless, only one empirical US-based study has examined pain in offspring of veterans, revealing that risk for headaches was high and tended to worsen over time, especially in younger children. Given this scarcity, there is a critical need for empirical research to characterize and establish the prevalence

of pain in children of Canadian veterans and understand the mechanisms underlying the intergenerational risk for chronic pain.

Methods: Using a cross-sectional sample, Dr. Noel will characterize pain and mental health (PTSD, anxiety, depression, insomnia, substance use) in Canadian veterans and their children using psychometrically sound questionnaires.

Expected Results: Data collection is ongoing. Thirty-one members/veterans ($Mage = 50.7$ years, $SD = 7.5$; 77% male) and their 19 young adult children ($Mage = 18.5$ years, $SD = 6.2$; 69% female) were included in this sample. The remaining 12 children/adolescents contributing to the 31 parent-child dyads were not included in preliminary analyses. Most of the sample self-identified as white (84% of members/veterans, 74% of their children). All members/veterans ($n = 31$) and 47% ($n = 9$) of their children reported having pain for at least 3 months in a row. The majority of members/veterans (77%) and their young adult children (36%) endorsed having pain in their muscles and joints. Members/veterans reported an average pain intensity of 6.9/10 ($SD = 1.2$), whereas young adults' average pain intensity was 4.1/10 ($SD = 1.7$). Members/veterans endorsed trauma symptoms' severity in the severe range ($M = 44.0/80$, $SD = 16.5$) with 77% ($n = 24$) meeting the clinical cut-off score indicative of probable PTSD. Young adult children reported trauma symptom severity in the moderate range ($M = 27.8/80$, $SD = 19.9$) with 23% ($n = 7$) meeting the clinical cut-off score indicative of probable PTSD. More severe PTSD symptoms reported by members/veterans were significantly associated with higher levels of their pain intensity, $r = .42$, $p = .020$, pain unpleasantness, $r = .39$, $p = .042$, and pain interference, $r = .57$, $p < .001$. Further, more severe parent PTSD symptoms were significantly associated with lower youth pain intensity, $r = -.52$, $p = .028$.

Conclusions: This project will provide the first data on the prevalence of pain in Canadian Veterans and their families and will examine potential mechanisms (family functioning, protective responses, stoicism) underlying this transmission.

6D03: Military Family-Centred Resilience-Building: A scoping review

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Introduction: Military members, Veterans, and their families (MF) must be resilient individually, collectively, and organizationally to effectively respond to and recover from military life adversities. Researchers identify prevalent MF

challenges including reduced well-being/health, financial stress, relational strain in couples/children. Further, compared to civilian populations, MF children/youth utilize more mental health services, and MF with neurodiverse children/youth or dependent elderly parents likewise demonstrate heightened support needs. In acknowledgement of military life adversities, the Canadian Armed Forces (CAF) championed the *Strong, Secure, Engaged* national policy, and committed to resilience-building in MF. Indeed, research highlights that positive changes in family systems can have beneficial ripple effects on other related ecosystems. Thus, we tested made-in-Canada resilience-building programmes with MF to build resilience in communities and children, and our research shows promise yet is in its infancy leaving unanswered questions. This study aims to identify effective MF resilience-building programming, and to determine whether adversity impedes or facilitates resilience-building.

Methods: Our scoping review examines published, peer-reviewed articles that include studies on resilience-building programming for MF. A preliminary search was completed to define an initial search strategy, upon which a full search strategy (informed by a Population, Concept, Context framework) was developed. Articles published in English from database inception until January 2022, found in eight EBSCOhost databases, MEDLINE (Ovid), Embase (Ovid), APA PsycInfo (Ovid) and Social Services Abstracts (Proquest), are being screened for eligibility. The full texts of relevant studies will be assessed against the inclusion criteria. Reasons for exclusion of full-text studies will be recorded using the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) framework.

Expected Results: Data will be extracted from relevant articles using an extraction tool to identify provider type, overarching programme aim and effectiveness, and whether adversity is interpreted as either barrier, facilitator or a mixed factor in MF resilience-building. Extracted concepts will be summarized using tables. Of note, effectiveness can be presented in multiple ways. For example, the results from administrative data, randomized controlled trials, qualitative child/youth/family narratives or family-reported outcomes in empirical studies may be considered for inclusion to demonstrate resilience-building programme effectiveness.

Conclusions: This review will help inform Military family-centred resilience-building programming in Canada. Last, as part of next steps, our team is launching a three-year pan-Canadian implementation project, using mixed methods and stakeholder engagement including MF, service providers, decision- and policy-makers.

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PRIMARILY MENTAL HEALTH & WELL-BEING

Podium Presentations

1E02: Real-time fMRI Neurofeedback Targeting the Posterior Cingulate Cortex in Post-traumatic Stress Disorder and Healthy Controls: Altered effective connectivity to the default-mode and salience networks

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Introduction: Alterations within intrinsic connectivity networks, including the default mode network (DMN) and salience network (SN), have been consistently found among individuals with posttraumatic stress disorder (PTSD). Evidence from previous real-time fMRI and EEG neurofeedback studies in PTSD suggest that regulating the posterior cingulate cortex (PCC), the primary hub of the posterior DMN, may be effective in reducing PTSD symptomatology and normalizing altered DMN and SN connectivity. Critically, PCC effective connectivity to DMN and SN hubs during real-time fMRI neurofeedback targeting the downregulation of the PCC has yet to be explored.

Methods: Using an emotion induction paradigm, we investigated psychophysiological interactions (PPI) over 3 real-time fMRI neurofeedback training runs targeting PCC downregulation, as well as a transfer run to assess learning effects, among participants with PTSD (n=14) and healthy controls (n=15). PCC effective connectivity was investigated across the whole-brain, and within key DMN and SN regions, during both a regulate condition, in which participants downregulated PCC activity, as well as a view condition, in which participants did not attempt to control the neurofeedback signal.

Results: In regulate as compared to view conditions, we found within- and between-group differences in PCC effective connectivity. Only the PTSD group showed significant PCC connectivity with anterior DMN (dmPFC, vmPFC) and SN (posterior insula) regions, whereas both groups showed PCC connectivity with posterior DMN areas (precuneus/cuneus). Interestingly, as compared to controls, the PTSD group showed significantly greater PCC connectivity with the amygdala during regulate as compared to view conditions. Moreover,

multiple regression analyses revealed that during regulate compared to view conditions, PCC effective connectivity to DMN and SN regions was positively correlated to PTSD-related symptoms as well as other clinical measures including childhood trauma scores, difficulties in emotion regulation, and both dissociation and depressive symptoms.

Conclusions: In summary, results related to PCC effective connectivity to both the DMN and SN provide novel evidence of the neural mechanisms underlying PCC-targeted real-time fMRI neurofeedback among individuals with PTSD and healthy controls. Along with previous research by our group, the current results support the utility of neurofeedback as a means by which to normalize altered large-scale brain network activity in PTSD. Future clinical trials investigating PCC-targeted real-time fMRI neurofeedback are warranted, as novel neuroscientifically-guided therapies for PTSD are urgently needed to reduce illness-burden.

1E03: Validation of Multi-modal Motion-assisted Memory Desensitization and Reconsolidation software for Public Safety Personnel

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Introduction: The delivery of evidence-based therapies targeting post-traumatic stress disorder (PTSD) has been the focus of the military and public safety personnel (PSP) organizations globally. With over 66% of military members continuing to experience symptoms after completing current evidence-based treatments, more innovative, engaging and effective treatments are needed. Multi-modal Motion-Assisted Memory Desensitization and Reconsolidation (3MDR) is a virtual-reality supported therapy being utilized to treat military members and veterans with treatment-resistant PTSD. Given 3MDR's demonstrated efficacy in recently published RCTs, there is appetite to adapt the intervention for other trauma-affected populations and to improve accessibility to the treatment. The purpose of the current study was to further validate new and existing software components of 3MDR to enhance the feasibility, and applicability of 3MDR for other trauma affected populations, including PSP.

Methods: This project utilized a (1) modified Delphi expert consultation method, and (2) embedded mixed-methods quasi-experimental validation study with the purpose of software validation amongst Canadian PSP. An international team from the Netherlands, United States, and Canada met regularly via Zoom to discuss adoption of 3MDR in real world contexts and the development of hardware and software.

Innovations that maintain 3MDR's effectiveness but are portable and affordable were discussed and piloted at multiple sites. Upon development of the software, it underwent a validation study, which included virtual focus groups and surveys with PSP participants (n=35). Qualitative and quantitative data was triangulated.

Results: PSP participants widely acknowledged that the newly developed 3MDR software would be applicable and feasible for those trauma affected personnel within their professions. The key themes that emerged from the validation study amongst PSP included: (1) occupational-tailored virtual environments, (2) individually tailored immersion, and; (3) beyond military populations. This project resulted in the identification, description, and development of new 3MDR software.

Conclusions: PSP participants perceived that 3MDR had relevance for trauma-affected populations beyond military members and veterans. This will pave the way for hardware and software evolution to address the recommendations and themes that arose from the PSP participants. Going forward, it is necessary to innovate and adapt 3MDR, as well as other trauma interventions, for increased effectiveness, accessibility, and efficacy, amongst trauma-affected populations.

1E04: "It Just Becomes You": The development, prominence, and loss of paramedic identity

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Introduction: Role identity theory explains that people find purpose and meaning from holding social roles. More salient roles feature more prominently in the sense of self and there is an accumulation effect where having multiple roles affords more diversified purpose and meaning. Paramedics hold a respected position in society, but have been found to have high rates of post-traumatic stress injuries and long-term disability. Where paramedic role identity features prominently in the sense of self, loss of the identity through disability can be devastating. My objective was therefore to explore the development of paramedic role identity, the processes by which it comes to prominence, and the potential consequences of its loss.

Methods: I interviewed a purposely selected sample of 21 paramedics from a single paramedic service in Ontario, Canada. Among other relevant demographic categories, my sample included members who were reintegrating into the workplace after an occupational stress leave. Interview questions focused on defining paramedic role identity, how the identity forms part of the person's sense of self, and - for the participants who had taken an occupational stress leave - how the identity can be threatened through disability. All interviews were recorded and transcribed verbatim. Situated in an interpretivist epistemology and sensitized by the propositions of role

identity theory, I used inductive thematic analysis to analyze transcripts with successive rounds of open and then focused coding.

Results: Through 41 interviews, I defined a framework wherein features of paramedic work created conceptual distance between the participant and the broader community in which they live. Within this framework, frequent exposure to trauma and "a very different side of life" meant that the participants commonly saw themselves as "living in a different world". Combined with a perceived lack of transferable skills, irregular work hours that limit social interactions and the participants' preference to associate with coworkers, the result was a progressive literal and metaphorical separation from society that led the paramedic role identity to feature prominently in the participants' sense of self: "I do not have an identity outside of being a paramedic." Loss of the identity because of disability amounted to loss of the self.

Conclusions: Amid growing recognition of a mental health crisis among paramedics, role identity theory provides a useful framework to conceptualize a previously under-explored dimension of this crisis. From a policy perspective, loss of paramedic identity should be considered in supporting members who are navigating the disability process.

1E05: Transforming Health Care Through Innovation: Medically managed intensive outpatient programming

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Program/Intervention Description: Untreated mental health in first responders and access to evidence-based treatments have been significant concerns in the setting of the COVID pandemic.

The research has shown intensive trauma-focused therapy increases the rate of recovery for many people suffering from PTSD, Traumatic Psychological Injuries or Occupational Stress Injuries. By fusing a bio-psycho-social-spiritual treatment model in an innovative medically managed intensive outpatient program model, can we increase access to care and reduce wait times, rapidly resolve psychiatric diagnoses, and help people return to work and a meaningful quality of life?

We will present outcomes from a Novel medically managed intensive outpatient program. The program incorporates intensive trauma-focused therapy, Acceptance Commitment Therapy, DBT informed group, CBT for insomnia, personal training, physiotherapy, and Trauma Sensitive Yoga along with medication management in an interdisciplinary bio-psycho-

social-spiritual model.

Evaluation Methods: The patient population observed in the study includes first responders, veterans, and members of the community suffering from severe and often treatment resistant psychiatric disorders including PTSD, Major Depressive Disorder, Substance Use Disorders, and Somatic Symptom Disorder. Many have significant functional impairment, including being off work due to the severity of their illness.

Results: Results of the Retrospective Observational Study have not been statistically analyzed at this time. Results will include: 1. PHQ-9; 2. GAD7; 3. PCL-5; 4. ACE Questionnaire; 5. WHOQOL; 6. Retention to Treatment.

Conclusions: Data suggests that medically managed intensive outpatient programs may have improved retention to treatment and validated psychometric outcomes than seen in the classic literature in the treatment of trauma related disorders, depression, anxiety, and addiction. We will present our data for the first time hypothesizing that we will see the same increased retention to treatment and improved outcomes.

3E01: Organizational Factors in Public Safety Organizations: Impact on mental health and work outcomes

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Introduction: Public safety personnel, including firefighters, paramedics, and police officers, are frequently exposed to psychological trauma in the course of their daily work. While the importance of attending to public safety personnel mental health has been established, the impact of organizational factors is not well understood. This scoping review maps the impact of organizational factors on workplace mental health in public safety organizations, identifying the characteristics, participants, contexts, and results of related studies.

Methods: English language primary studies from January 2000 until November 2021 were considered. Studies from Australia, Canada, New Zealand, the UK and USA were included. JBI methodology and the Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews was followed. The search was carried out in MEDLINE, Embase, PsycInfo, CINAHL, and Web of Science to ensure a broad search. Duplicates were removed, and two independent reviewers screened the titles, abstracts, and full-text of the selected studies. Data collection was performed with a tool developed by the researchers, based on JBI's model instrument for extracting study details, characteristics, and results.

Results: 13543 records were retrieved, after screening, 97

primary studies remained for analysis. Sixty percent (n=58) of papers were published in the last 5 years. The majority of included studies were conducted in North America (n=62). Two thirds of included studies utilized cross sectional research designs (n=61), qualitative (n=15) and cohort studies (n=5) were the next most frequent study designs. Police officers (n=48) were the most frequent population studied. Correctional officers and paramedics (each n=27) were the second most frequently identified populations, followed by firefighters (n=20). Coworker support (n=10) was the most frequently identified organizational factor which facilitates mental health, followed by supervisor support (n=8) and adequate training (n=3). Lack of supervisor support was the most frequently cited organizational stressor (n=23) followed by workplace culture (n=21), and high workload (n=20).

Conclusions: This scoping review is the first to map organizational factors and their impact on public safety personnel mental health within public safety organizations. The results of this review can inform discussions related to organizational factors and their interaction with operational and personal factors, to assist public safety employers and unions in considering which factors are the most impactful on mental health and which are most amenable to change.

3E02: Longitudinal Study of Canadian Correctional Workers' Well-being: Baseline mental health

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Introduction: The occupational responsibilities of correctional workers include violence prevention, riot control, and pre-hospital emergency medical care. Correctional workers provide emergency services in federal penitentiaries that span diverse roles of other public safety personnel (e.g., police, paramedics) and may be exposed to several potentially psychologically traumatic events (PPTs). Researchers and practitioners have examined mental health challenges facing public safety personnel from diverse stressors, but results from longitudinal data collections remain scant, particularly for institutional correctional workers. The current study was designed to assess the mental health of Correctional Service of Canada (CSC) correctional officer recruits (CORs) prior to engaging in their careers in federal penitentiaries, providing baseline mental health disorder prevalence rates.

Methods: The current study uses data from the Canadian Correctional Workers' Well-being, Organizations, Roles, and Knowledge (CCWORK) study. The CCWORK study uses a longitudinal design with self-report surveys administered online prior to CORs beginning the CSC Correctional Training

Program (CTP). Survey data were used to assess demographic information, and mental health symptoms, as well as potential risk and resiliency factors.

Expected Results: Participating CORs ($n=265$; 40% women; Mean age = 32.6) began the CSC CTP between August 2018 and July 2021. Many participants ($n=87$) reported having previously worked in correctional services, another public safety sector (e.g., firefighters, police, paramedicine), the armed forces, or nursing. Participants were less likely to screen positive current mental health disorders (i.e., 4.9%) than previously published rates for serving correctional officers (i.e., 54.6%), including reporting lower rates of posttraumatic stress disorder (i.e., 2.4% vs. 29.1%) and major depressive disorder (i.e., 1.9% vs. 31.1%). Relatively few participants (7.9%; $n=21$) reported a lifetime history of a mental health disorder diagnosis.

Conclusions: Prevalence of positive screens for current mental health disorders in CORs appears lower than for the general population and appear much lower than for serving correctional officers. The current results suggest an important causal relationship may exist between correctional work and detrimental mental health outcomes. Maintaining the mental health of correctional officers may require institutionally-supported proactive and responsive multimodal activities.

3E03: The Impact of Leadership Behaviours on the Mental Well-being of Public Safety Communicators

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Introduction: Public safety communicators (e.g., 911, police, fire, and ambulance call-takers), like many other public safety personnel (e.g., police, paramedics) suffer from operational stress injuries (OSIs) that are often hidden, and at a prevalence higher than the general population. There are very little data for OSI rates among Canadian communicators, and to our knowledge, this is the only pan-Canadian study focusing on organizational culture, and its potential influence on OSIs, within the communicator context. One objective of the research is to identify aspects of organizational culture that positively or negatively impact a communicator's ability to perform their duties.

Methods: We conducted an online survey of Canadian communicators, comprised of 17 validated screenings for occupational stress injuries and symptoms and four open-ended questions relating to agency organizational culture. Participants were solicited through emails, and we encouraged snowball sampling. Participants' open-ended responses were thematically analyzed.

Results: A semi-grounded analysis of participant responses ($n=329$) to open ended items included in a larger national

online survey revealed that communicator OSIs are impacted by organizational and operational factors (work environment; e.g., feeling undervalued by one's organization, exposure to potentially traumatic psychological events, insufficient mental health supports), and interactions with others (interpersonal work relationships; e.g., management, colleagues, the community). Findings reveal managers and supervisors were significant contributors to negative perceptions ($n=165$) of organizational culture, potentially resulting in, or worsening existing OSIs. Specifically, leadership was viewed as ineffective, inconsistent, unsupportive, abusive, and toxic, with limited understanding of communicator roles. Communicators described feeling devalued, particularly when leaders fail to recognize communicator OSIs, which can perpetuate stigma. Conversely, positive leaders ($n=24$) were described as supportive, communicative, and encouraging.

Conclusions: The findings suggest that, while organizational culture is a key factor in employee well-being; it varies considerably across agencies. Notably, managers and supervisors can positively or negatively influence treatment-seeking behaviours related to potential OSIs. Our new understandings of leadership's pivotal role in OSIs may help reduce the frequency and severity of communicator OSIs, helping ensure that emergency services are delivered to Canadians. Moreover, these data could feed into a national mental health strategy that is specific to communicators.

3E04: Clinical Development and Rationale of the Before Operational Stress program

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Brief Description: The Before Operational Stress (BOS) program began dissemination in 2018 to public safety personnel across Canada, and at the time of the current proposal approximately 1000 frontline public safety members have completed the program. The results of the initial pilot data study were published in 2021 (Stelnicki et al., 2021), and demonstrated statistically significant improvements in several markers of mental health for study participants. The current proposal intends to provide information regarding the theoretical and clinical rationale of the BOS program, and will provide background regarding how the program was developed in relation to clinical and anecdotal evidence from frontline public safety personnel. This presentation will review the theory and rationale for the program, which informs the content and procedural development of the program.

Patient Population: This presentation will be particularly relevant for clinical providers interested in learning and understanding how the Before Operational Stress program has been developed and is focused on supporting proactive psychological protection to frontline public safety personnel. This presentation will also be relevant for leaders of public

safety organizations and frontline members interested in learning more about upstream mental health training. It is important to note that several Canadian public safety organizations have now instituted BOS training as part of recruit onboarding, and thus this presentation would also be of interest to training officers and human resource members from public safety organizations.

Results: This presentation will intentionally not focus on the research results, as the research will potentially be discussed by the independent researchers at Canadian Institute for Public Safety Research and Treatment (CIPSRT) in a separate presentation.

Conclusions: The emerging empirical and anecdotal data has supported that the Before Operational Stress program has been well received and effective for frontline public safety members in terms of increasing mental health literacy and skill development for the public safety members who have completed the program. The program has several conditions that are now available for public safety members, with ongoing program evaluation efforts focused on ensuring the effectiveness and fidelity of the program. The BOS program appears to be increasingly positioned as a standard of upstream mental health training for public safety personnel and thus it is an important intervention for leaders, clinicians and frontline members to understand.

3E05: Expansion and Evaluation of the Before Operational Stress Program

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Introduction: Public safety personnel (PSP) in Canada such as correctional workers, firefighters, paramedics, police officers, and military personnel are often exposed to potentially psychologically traumatic events and stress as part of their operational duties. PPTe exposures may have lasting impacts and result in mental health injuries, which gives rise to the need for programs and solutions to support PSP mental health. Treatments for mental health injuries are not always demonstrably effective, suggesting ongoing proactive and responsive interventions may be critically important. Very few interventions are tailored specifically to PSP and most focus on bolstering resiliency to mitigate the impacts of stressors in a single session with no follow-up.

Methods: The Before Operational Stress (BOS) program was designed as an early intervention in a PSP career to enhance self-awareness, promote healthy relationships, and provide PSP with better resources to process the events they may be exposed to throughout their work. The BOS program components were derived from established cognitive

behavioural therapies. A current ongoing study is delivering the BOS program to PSP across Canada in three modalities: an 8-week in person group, an 8-week virtual group, or an 8-week online self-directed course. Participants are recruited from various PSP organizations and can choose to participate in the research component which includes three surveys (i.e., completed before and after the BOS training, a 3-month follow-up) and interviews about the training experiences. The surveys consist of demographic information and measures for symptoms of depression and anxiety, as well as mental health knowledge, and resiliency, mirroring the BOS training ideals.

Expected Results: Previous research has evidenced the BOS in-person training as producing small to moderate improvements in PTSD symptoms, quality of life, stigma, and perceived social support. Preliminary results from a separate study comparing BOS in-person and virtual training have also supported both delivery methods as producing improvements in emotional regulation, stigma, and shame over time. Some differences between modalities also exist, such as higher stress and lower physical, relationship, and environmental quality of life being observed in the in-person groups compared to the virtual delivery.

Conclusions: The current study provides an unprecedented opportunity to further evaluate the impacts of BOS with an exceptionally large sample size and compare highly accessible online self-directed training to other modalities, including virtual delivery and in-person group training. The presentation will include results from the ongoing data collection, as well as implications and directions for future research.

3E06: Are We Missing the Target? Paramedics' Perceptions of Workplace Mental Health Supports

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Introduction: Research has shown there are high rates of mental health disorder symptoms among paramedics. Barriers such as stigma, lack of benefit coverage, and difficulty in finding knowledgeable mental health professionals prevent paramedics from seeking or accessing help. Paramedic employers are encouraged to tackle the challenge of mental health issues among their staff. The Canadian Standards Association Psychological Health and Safety in the Paramedic Organization Standard and other organization's frameworks are voluntary tools that provide guidance on psychological health and safety risk mitigation. Programs such as Peer Support Teams, Employee and Family Assistance Programs, and therapy dogs have become popular go-tos. However, they have limited evidence and face institutional challenges, including cultural acceptance among the paramedics themselves. Therefore, our objective was to explore paramedics' perspective of existing workplace mental health resources and assess alignment with perceptions of usefulness.

Methods: Situated within an interpretivist epistemology, we interviewed a purposively selected sample of 21 paramedics from a single paramedic service in Ontario as part of a qualitative descriptive study. Each interview was recorded and transcribed verbatim and analyzed using the principles of inductive thematic analysis. This involved successive rounds of open and focused coding using gerunds to develop a descriptive account of the participants' perceptions of the support services available in the local context.

Results: Over the course of 41 interviews, paramedics provided mixed reviews of the workplace's supports, often voicing concerns around inadequate or inappropriate providers. Additionally, programs were sometimes described as a "checkbox" solution or something that would not be personally useful. Paramedics rarely spoke of missing formal programs, but instead discussed workplace culture, the need for informal support, and the importance of building trust in supervisors as a means to tackle mental health concerns.

Conclusions: Paramedic workplaces are aiming to provide adequate mental health supports for frontline staff. Research into the effectiveness of various supports is limited. Additionally, there seems to be a disconnect between what workplaces are providing and paramedics' perception of the value of said supports. Workplaces will need to bridge the gap between their staff and the programs or resources they provide for assistance. Further research into this area, including measurements regarding success of such initiatives, is suggested.

4E04: The Experiences of Women in Firefighting: A scoping review

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Introduction: Public safety personnel (including police, firefighters and paramedics) are faced with a number of daily hazards that place them at unique risk for physical harm and poor mental health outcomes. Some researchers have found that women specifically are at particular risk for negative physical and mental health related outcomes. Compared to policing (22%; Statistics Canada, 2019), women are employed at significantly lower rates in firefighting (less than 5%; Statistics Canada, 2017). Understanding the barriers to employment and experiences of women currently within the profession is therefore of utmost importance to promoting gender inclusion in firefighting. International research examining women firefighters' experiences suggests gender discrimination and harassment as prevalent within the service. Within Canada and the United States, however little is presently known about the experiences of women firefighters.

Methods: In order to understand the mental health related experience of women firefighters, a scoping literature review was conducted. The questions guiding this review were

"What is the state of the literature on Canadian and American women firefighters' workplace and mental health related experiences? Are sexual orientation and ethnicity represented in the literature?" This scoping review found 1276 potentially relevant results, which were then reduced to 11 relevant articles published in Canada and the United States.

Results: From this scoping review, several main themes were extracted, including a hostile work environment and negative gendered and racialized experiences; mental health concerns, including literature on alcohol use, suicide, depression, anxiety, stress, and posttraumatic stress disorder; and physical risks of the job. One study examining the experiences of Black women firefighters was found, while no research on sexual orientation was uncovered in this search.

Conclusions: Significant gaps in the literature base were exposed from this scoping review including a paucity of a) qualitative research, b) examinations of institutional and cultural context of firefighting, and c) research within a Canadian context. From a counselling perspective, another notable gap is the lack of a strengths-based or resiliency focus which could elucidate how women make meaning from their experiences and manage the associated stressors. Overall, research is needed in this area to more broadly understand the experiences of firefighting women and their recommendations for institutional level policy changes.

5D04: Understanding Work-Family/Family Work Conflict in Public Safety Families

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Introduction: Public safety personnel work in physically and psychologically taxing environments. These personnel must perform their occupational roles, while also maintaining their familial roles at home. Work-family conflict (Greenhaus & Beutell, 1985) is a bi-directional concept in which role pressures between family and work are incompatible in some way, making participation in one role more difficult by virtue of participation in the other. While work-family conflict has long been studied in family studies where well-used and validated measures have been developed to assess this conflict, it was unclear how well understood the concept is in the public safety literature. This study set out to identify and describe how work-family/family-work conflict is operationalized and measured in public safety families

Methods: A systematic review was conducted utilizing eight databases (MEDLINE, PsycINFO, Embase, Web of Science, Sociological Abstracts, PILOTS, EBSCO, and CINAHL) with the consultation of librarians. All returns were entered into Covidence, where duplicates were identified and removed.

Two screeners independently screened all entries first by title/abstract, then for full text against the inclusion/exclusion criteria, and finally conducted a critical appraisal of all included studies. Any conflict was discussed and resolved in group settings. Data were then extracted and synthesized using a meta-aggregation approach where possible.

Results: The review resulted in 94 primary research articles included from 1979-2021, available in English from 17 countries with representation from five public safety sectors. Studies were primarily of the policing population, with only one investigating public safety communicators. Within these 94 studies, 185 different terms were used surrounding work-family/family-work conflict. Despite work-family conflict involving the family, the majority of studies are primarily from the personnel perspective, reflecting on family. Of the 54 quantitative studies that stated they measured the term work-family conflict, Netemeyer et al., 1996 and Carlson et al., 2000 were the most common sources of work-family/family-work conflict measures. Unfortunately, even within the studies that claim to use a specific measure, these measures were not used in the same way and could not be statistically compared.

Conclusions: While work-family/family-work conflict exists amongst public safety professions, the concept is poorly understood and operationalized within research addressing public safety families. Family science offers a wealth of mature scholarship that could serve to enrich the field of public safety families research, better equipping researchers with theoretical and methodological approaches to studying families and reducing the perpetuation of conflicted and inaccurate use of constructs.

5E01: Moral Injury in Canadian Public Safety Personnel During the COVID-19 Pandemic

Ritchie, Kim, PhD¹; Brown, Andrea, PhD¹; Mina, Pichtik, BSc¹; D'Allessandro, Andrea, BA¹; Xue, Yuan, MSc¹; Beech, Isaac, BSc¹; Altman, Max, BSc¹; Millman, Heather, MA¹; Karram, Mauda¹; Lanisus, Ruth, MD, PhD²; McKinnon, Margaret, PhD¹

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Introduction: During COVID-19, public safety personnel (PSP; e.g. paramedics, firefighters, emergency dispatchers, police, border patrol, and correctional officers) have been at the forefront of the pandemic, facing a host of new and challenging situations. Previous studies have demonstrated that PSP are at an increased risk of moral injury (MI) due to the nature of their work, which can involve exposure to morally challenging decisions and situations. Frequent exposures to potentially morally injurious events (PMIEs) have been associated with an increased risk of post-traumatic stress disorder (PTSD) and MI in PSP. Currently, we have limited knowledge about the types of PMIEs experienced by PSP during the COVID-19 pandemic, and the impact of these experiences on their mental health and functioning.

Methods: The purpose of this study was to identify the types of PMIEs described by select groups of PSP during the COVID-19 pandemic and to describe the associated mental health and functional outcomes. PSP (e.g., police, firefighters, paramedics, emergency dispatchers, correctional workers, and border patrol) from across Canada were invited to participate in virtual, semi-structured interviews. Participants were asked to describe in detail events during the COVID-19 pandemic that transgressed or contravened their morals, and the impact of these events on their mental health and functioning. To date, a total of thirty-nine (N=39) interviews have been conducted. Qualitative data will be coded using MAXQDA software and analyzed using an inductive thematic approach

Expected Results: This study is ongoing and results will be available for the presentation. Results are expected to contribute knowledge about the types of events during COVID-19 that PSP identify as PMIE's and the psychological impacts of these events on PSPs personal and occupational functioning.

Conclusions: Findings from this study will contribute knowledge about MI in a diverse group of Canadian PSP. Organizations must be aware of the types of occupational situations which put PSP at risk of MI to appropriately respond with supports to prevent or mitigate MI. Understanding the effects of MI on PSP is critical to implement early interventions to decrease longer term mental health problems that could ultimately lead to some PSP leaving their profession.

5E02: Meat in Seat: Exploring moral injuries in public safety personnel

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Introduction: Public Safety Personnel (e.g., firefighters, paramedics, and police officers) are routinely exposed to human suffering and need to make quick, morally challenging decisions which can be impeded and frustrated. Events violating personal morals, ethics, or values have been termed potentially morally injurious events (PMIEs). PMIEs can produce varying degrees of moral pain, including psychological, existential, behavioural, spiritual, interpersonal distress, and occupational impairments. Left unresolved, moral pain may shift into posttraumatic stress injuries and/or moral injury (MI).

Our purpose in the current was to: (1) determine the state of evidence regarding MI in PSP; (2) reveal PSP current knowledge about MI and MI symptoms; and (3) identify PMIEs in police, firefighters, paramedics, and public safety communicators.

Methods: This qualitative study includes two phases. *Phase 1* - A scoping review of extant research on PMIEs and PSP. *Phase 2* - Semi-structured focus groups and interviews with PSP to identify PMIEs.

Participants include ten firefighters, seven paramedics and two communicators from Western Canada. Data was analyzed using a grounded theory approach.

Results: The initial database search returned 777 articles, 506 remained after removal of duplicates. Following review of titles, abstracts, and full texts, 32 studies were included in the current review. The scoping review indicated four dominant PMIEs themes for PSP: values; moral and ethical decision-making; organizational betrayal; and spirituality. Focus groups and interview results underscored the relevance of PMIEs and MI for PSP. A conceptual theory of “*frustrating moral expectations*” emerged, with participants identifying three interrelated properties as being potentially morally injurious: chronic societal problems, impaired systems, and organizational quagmires. Participants navigated their moral frustrations through both integrative and disintegrative pathways, resulting in either needing to escape their moral suffering or transform ontologically.

Conclusions: The current study results support MI as a relevant concept for frontline PSP. Public safety organizations appear to recognize the experience of moral distress or moral injury among PSP that causes dissonance between personal core values and formal and informal organizational values, vocational duties, and expectations. Given the seriousness of PSP leaving their profession or completing death by suicide to escape moral pain, the importance of the effects of MI on PSP and public safety organizations cannot be ignored or underestimated. Understanding the similarities and differences of PMIEs of frontline PSP may be critical for effectively determining mental health and resilience strategies.

5E03: “Against Everything That Got You Into the Job”: Canadian Public Safety Personnel’s Experiences of Potentially Morally Injurious Events

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Introduction: Research on moral injury (MI) has increased dramatically since the start of the COVID-19 pandemic. As this literature grows, so, too, does attention on the presence and impacts of MI in adjacent occupations such as those of public safety personnel (PSP), given that codes of conduct, high-stakes situations, and high rates of trauma exposure are often a

feature of these occupations. Emergent research suggests that MI is relevant to PSP: they frequently make decisions that are ethically or morally complex, ambiguous, and/or challenging; they may be exposed to betrayal by or corruption on the part of leadership. Consequently, they may be at risk of MI. The degree of exposure to MI inherent in the work of some PSP merits further exploration, particularly in the Canadian context.

Methods: This presentation shares the results of an interpretive phenomenological analysis of the presence of potentially morally injurious events (PMIEs) in the lived experiences of 38 PSP working as paramedics, communications officers, and logistics personnel in a public safety organization in Ontario. Through qualitative interviews, this study explored the types of events PSP identify as PMIEs, how PSP make sense of these events, and the psychological, professional, and interpersonal impacts these events have on PSP mental health. Thematic analysis supported the interpretation of PSP descriptions of events and experiences.

Results: This presentation will demonstrate that PMIEs do arise in the context of PSP work, namely during the performance of role-specific responsibilities, within the organizational climate, and because of inadequacies in the healthcare system. It will also demonstrate that PMIEs are as such because they violate core beliefs commonly held by PSP and compromise their ability to act in accordance with the principles that motivate them in their work. Finally, this study also identified that PSP associate PMIEs, in combination with traumatic experiences and occupational stress, with adverse psychological, professional and personal outcomes.

Conclusions: This study contributes to the growing literature on MI in PSP, providing additional empirical evidence to support the understanding of the nature and effects of PMIEs in diverse frontline populations supports the conceptualization of moral injury in the PSP context, supporting broadening definitions and applications of moral injury and related constructs outside the military and Veteran context. These efforts can, going forward, inform education and intervention efforts to benefit the mental health of all who serve.

6B04: Canadian Healthcare Workers Considering Leaving Position due to Moral Distress during the COVID-19 Pandemic

D’Alessandro, Andrea, MSc (Cand)¹; Ritchie, Kim, PhD^{1,2}; Brown, Andrea, PhD¹; Pichtikova, Mina, BSc¹; Xue, Yuanxin, MA¹; Beech, Isaac, BSc¹; Altman, Max, BSc¹; Millman, Heather, MA¹; Hoisseny, Fardous, MSc^{3,4}; Rodrigues, Sara, PhD^{3,4}; O’Connor, Charlene, MSc⁵; Schielke, Hugo, PhD⁵; Malain, Ann, PhD⁵; Heber, Alexandra, MD^{1,6}; McCabe, Randi, PhD^{1,7}; Lanis, Ruth, PhD^{8,9}; McKinnon, Margaret, PhD^{1,2,7}

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Health Centre; ⁶Veterans Affairs Canada; ⁷St. Joseph's Health-care Hamilton; ⁸University of Western Ontario; ⁹Lawson Health Research Institute

Introduction: The COVID-19 pandemic has resulted in an increase of potentially morally distressing situations for healthcare providers (HCPs) across the globe, including working with staff and resource shortages and performing perceived futile care. Critically, moral distress has been associated with poor psychological outcomes (e.g., symptoms of depression, anxiety, PTSD, burnout) and intention to leave one's position and/or profession both before and during the pandemic among HCPs. To develop adequate retention programs, it is vital to understand intention to leave among HCPs during the pandemic period. Accordingly, the purpose of the present study is to characterize HCPs who were considering leaving a position during the COVID-19 pandemic and identify psychological factors related to this consideration.

Methods: HCPs from across Canada were invited to participate in an online survey about mental health and functioning, including a basic demographic form (e.g., occupation, age, sex, gender) and psychometrically validated measures of psychological and functional outcomes (e.g., moral distress, depression, anxiety, PTSD, substance use, functional impairment, insomnia).

Expected Results: To date, 300 (N=300) HCPs participated in the study between June and December 2021, including nurses, medical physicians, occupational therapists, social workers, respiratory therapists and other HCPs. Only participants who answered the focal question "Are you considering leaving your clinical position due to moral distress?" were included in analysis (n=216). Data analysis remains ongoing. Preliminary analyses reveal that almost half of the participants surveyed (45.4%) were considering leaving their position. Further, HCPs who were considering leaving their position reported elevated symptoms of moral distress, depression, anxiety, stress, PTSD, disengagement, emotional constriction, insomnia, functional impairment and work impairment than their counterparts who were not considering leaving. Predictive models will be run to determine factors related to consideration to leave among this sample.

Conclusions: Nearly half of the Canadian HCPs surveyed throughout 2021 reported considering leaving a clinical position due to moral distress. These individuals were characterized by elevated symptoms of mental illness and functional impairment when compared to their counterparts who were not considering leaving. Preliminary results from this investigation demonstrate the urgent need for adequate prevention and early intervention supports for HCPs in addition to targeted retention efforts.

Poster Presentations

P109: Digital Interventions to Reduce Distress Among Health Care Providers at the Frontline: A feasibility trial

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Introduction: Stress, anxiety, distress, and depression are high among health care workers during the COVID-19 pandemic, and they have reported acting in ways that are contrary to their moral values and professional commitments that degrade their integrity. This creates moral distress and injury due to constraints they have encountered, such as limited resources. The purpose of this study is to develop and show the feasibility of digital platforms (a virtual reality and a mobile platform) to understand the causes and ultimately reduce the moral distress of health care providers during the COVID-19 pandemic.

Methods: This will be a prospective, single cohort, pre- and posttest study examining the effect of a brief informative video describing moral distress on perceptual, psychological, and physiological indicators of stress and decision-making during a scenario known to potentially elicit moral distress. To accomplish this, we have developed a virtual reality simulation that will be used before and after the digital intervention for monitoring short-term impacts. The simulation involves an intensive care unit setting during the COVID-19 pandemic, and participants will be placed in morally challenging situations. The participants will be engaged in an educational intervention at the individual, team, and organizational levels. During each test, data will be collected for (1) physiological measures of stress and after each test, data will be collected regarding (2) thoughts, feelings and behaviors during a morally challenging situation, and (3) perceptual estimates of psychological stress. In addition, participants will continue to be monitored for moral distress and other psychological stresses for 8 weeks through our Digital intervention/intelligence Group mobile platform. Finally, a comparison will be conducted using machine learning and biostatistical techniques to analyze the short- and long-term impacts of the virtual reality intervention.

Expected Results: The study was funded by the Department of Defence (IDeAS) in November 2020 and received research ethics board approval in March 2021. The data collection is complete, the analysis is being completed.

Conclusions: This project is a proof-of-concept integration to demonstrate viability over 6 months and guide future studies to develop these state-of-the-art technologies to help

frontline health care workers work in complex moral contexts. In addition, the project will develop innovations that can be used for future pandemics and in other contexts (civilian and military) prone to producing distress in general and moral distress in particular.

P110: COVID-19-Related Moral Injury in Healthcare Providers: A qualitative analysis of events and outcomes

D'Alessandro, Andrea, MSc (Cand)¹; Ritchie, Kim, PhD^{1,2}; Brown, Andrea, PhD¹; Pichtikova, Mina, BSc¹; Xue, Yuanxin, MA¹; Beech, Isaac, BA¹; Altman, Max, BSc¹; Millman, Heather, MA¹; Karram, Mauda, BSc (Cand)¹; Hoisseny, Fardous, MSc^{3,4}; Rodrigues, Sara, PhD^{3,4}; O'connor, Charlene, MSc⁵; Schielke, Hugo, PhD⁵; Malain, Ann, PhD⁵; Heber, Alexandra, MD⁶; McCabe, Randi, PhD^{1,7}; Lanius, Ruth, PhD^{8,9}; McKinnon, Margaret, PhD^{1,2,7}

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Introduction: The COVID-19 pandemic has introduced a range of potentially morally injurious events (PMIEs) for healthcare providers (HCPs), including witnessing patients dying without family and feeling unsupported by employers. To date, however, PMIEs and moral injury are not fully understood in the healthcare context. Accordingly, this study aims to gain a nuanced understanding of COVID-19-related PMIEs and the associated effects of these exposures on HCPs.

Methods: HCPs from across Canada were invited to participate in a virtual interview throughout 2021. In semi-structured interviews, participants were asked to describe their experiences during COVID-19, including events they define as morally injurious (e.g., "While working during the pandemic, have you encountered situations that have conflicted with your moral code?"). Interviews were audio-recorded and transcribed verbatim. Qualitative thematic analysis using an inductive approach is currently underway to understand and represent HCPs' experiences.

Expected Results: To date, 92 interviews have been completed with HCPs from across Canada, including respiratory therapists, nurses, occupational therapists, physicians and social workers. Preliminary analyses reveal the varied exposures to PMIEs that HCPs have endured, such as contributing to perceived futile care, enforcing no-visitor policies and working with inadequate resources and staff, consequently impacting patient care. HCPs described a range of impacts associated with these events, including grief, guilt, anger and consideration to leave their position.

Conclusions: Findings from this study will provide critical information on the circumstances that contribute to moral injury among HCPs during the COVID-19 pandemic as well as the psychological impact of these events among Canadian HCP. These data will be used to inform adequate prevention, early

intervention and treatment programs for HCPs suffering from COVID-19-related moral injury.

P111: Ontario Public Safety Personnel with Work-related Psychological Injuries: Workplace safety insurance board data on occupational therapy usage from 2017-2021

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Introduction: Worker's compensation claims for Public Safety Personnel (PSP) with work-related psychological injuries, including post-traumatic stress disorder (PTSD), are on the rise in Ontario. Since presumptive legislation came into effect in Ontario in 2016, PSP have had greater access to health services through the workplace safety insurance board (WSIB Ontario) for PTSD-related claims. Occupational therapy has frequently been a requested service for these claims, often with a focus on home and community function with a goal of returning PSP to work. To date, no research has quantified the scope of this health service usage or considered trends and patterns in the referral of PSP to occupational therapy.

Methods: Using a quantitative retrospective cohort approach, 5 years of data was obtained from WSIB Ontario covering 2017-2021. The sample included Ontario public safety personnel who made a mental stress injury claim between 2017 and 2021 and received occupational therapy services at some point in their claim duration. The data collected included public safety personnel demographic data, information on career type and experience, overall health care usage, occupational therapy service duration and timing, and return to work outcomes. Statistical analysis will summarize demographics, career information, and health care data using frequencies and means as applicable, as well as investigate associations between demographics, career, health care usage, timing of access to occupational therapy, duration of treatment, and return to work outcomes through correlation and regression analysis.

Expected Results: Data is currently under statistical analysis and will be available for dissemination and discussion in October 2022. Results will summarize the types of claims that received access to occupational therapy, their demographics and career information, the length of time from claim registration to service access, the typical duration of services, and return to work outcomes of the sample, as well as highlighting the associations between these variables. The results of the data analysis have the potential to show the optimal timing of occupational therapy services within the WSIB Ontario claim duration.

Conclusions: This research is the first to summarize the usage of occupational therapy in WSIB Ontario claims of PSP with work-related psychological injuries. This data will

inform discussions on current patterns of health service usage, as well as optimal ways to utilize occupational therapy in this context, providing recommendations for public safety employers, worker's compensation systems, and healthcare providers.

P112: Public Safety Personnel's Coping Strategies During the COVID-19 Pandemic

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Introduction: During the COVID-19 pandemic, public safety personnel (PSP; e.g., paramedics, firefighters, police officers, corrections officers, border patrol officers, emergency dispatchers) may experience increased occupational stress and burnout due to various COVID-19-related stressors, such as fear of transmitting the virus to family, enforcing lockdowns and mandates, long work hours, and serving distressed civilians. Consequently, PSP are enduring adverse mental health outcomes surrounding increased levels of emotional instability, chronic stress, anxiety, and post-traumatic stress symptoms. Previous studies have provided insight on how PSP cope with stress during the pandemic, including strategies such as alcohol, humour, social support, and practicing religion or spirituality. However, it remains unclear how the pandemic context has impacted PSP's coping strategies. This study aims to gain a deeper understanding of PSP's coping strategies during the COVID-19 pandemic.

Methods: This study is part of a broader study on Canadian healthcare workers' and PSP's mental health and experiences during the COVID-19 pandemic. PSP across Canada participated in virtual semi-structured interviews from June to December 2021. To date, a total of thirty-nine (N=39; 18 paramedics, 10 firefighters, 2 dispatch officers, 4 police officers, 4 corrections officers, and 1 municipal law enforcement officer) interviews took place and were transcribed verbatim and de-identified. Qualitative data will be coded using MAXQDA software and analyzed through an inductive thematic approach.

Expected Results: Data collection remains ongoing and data analysis will be complete prior to the conference poster submission deadline.

Conclusions: A rich understanding of PSP's coping strategies in response to COVID-19-related stressors will provide insight on the ways PSP coped with additional stress during the pandemic. This information will inform supports and resources to improve the mental health of Canadian PSP.

P113: Homewood Inpatient Program Outcomes for Guardians

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Program/Intervention Description: The Guardians program is a 9-week inpatient traumatic stress injury & concurrent substance use program for First Responders, Military, and Veterans (FRMV) delivered at two sites, Homewood Ravensview in Victoria, British Columbia, and Homewood Health Centre in Guelph, Ontario. Clients receive group-based Cognitive Processing Therapy for treatment of post-traumatic stress disorder, as well as Motivational Enhancement and Cognitive-Behavioural Therapy (CBT)-based interventions for substance use disorders. Clients also receive a manualized CBT program designed specifically for the needs of FRMV, including topics such as moral injury, identity, etc. The program model is one of healing in community, in which Guardians complete all core program within their FRMV peer group, while having opportunities to engage with civilian peers in a supported setting, allowing for healing both within and outside of the uniform.

Evaluation Methods: Retrospective secondary data was used to evaluate the Guardians program. Homewood Touchpoint, a measurement based care program, is embedded in the program, where clients complete measures at regular intervals to facilitate treatment planning and outcome measurement. Patient satisfaction data is also collected for each client at discharge.

Results: Clients experienced benefits of the program, which included a reduction in anxiety, depression and trauma symptoms.

Conclusions: The treatment outcomes indicate that the Guardians program has been well-received by clients, and been successful in reducing clinical symptoms.

PRIMARILY PHYSICAL HEALTH & WELL-BEING

Podium Presentations

4E03: Predictors of Test Outcomes for Females on the Ottawa Paramedic Physical Abilities Test

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Introduction: A gender disparity exists in many public safety sectors, with significantly more males being employed

compared to females. Within the paramedic sector, females comprise less than ¼ of the workforce (Crowe et al., 2019). Lack of gender diversity in these professions may be due to lower rates of success for females when participating in physical employment standards (PES) (Gumieniak et al., 2018; Jamnik et al., 2010). The Ottawa Paramedic Physical Abilities Test (OPPATTM) is an established, legally defensible PES that provides a measure of physical readiness for paramedic tasks. By identifying factors that predict OPPATTM success among females, we can inform strategies to improve their readiness for duty. In turn we can mitigate gaps in gender inclusion within the workplace.

Methods: We conducted a retrospective, cross-sectional analysis of data from females completing the OPPATTM ($n=208$). Participants self-reported their physical demographics (*mean +SD; height, 164 +7 cm; weight, 70 +14.2 kg*), their training school (*142 private, 66 public*) and their employment status (*157 incumbent paramedics, 51 active-duty paramedics*). Pre-testing Polar Heart Rate data was reported by OPPATTM clinical staff and body mass index (BMI) was calculated based on self-reported height and weight. These six factors were used in a logistic regression model to predict the likelihood of successfully completing the OPPATTM. Likelihood ratio tests using a backward selection method were used to identify which factors were the strongest predictors of performance.

Expected Results: The logistic regression and likelihood ratio tests revealed that a model with three factors could predict OPPATTM success ($p < 0.01$; *pseudo $R^2=0.13$*). Individuals who were employed (*OR:2.89, 95% CI:1.52-15.75*), those who had lower BMI (*OR:0.82, 95% CI:0.71-0.93*), and those with high body weight (*OR:1.12, 95% CI:1.07-1.19*) were more likely to successfully complete the OPPATTM.

Conclusions: Employment status, BMI and weight were significant predictors of OPPATTM success; but, only explained 13% of the variance in performance outcomes. Employment status may increase the likelihood of success by increasing opportunities to develop job-specific strength, and/or by increasing familiarization (Armstrong et al., 2019). BMI and mass may relate to lean body mass, where successful military PES outcomes were higher in those with higher lean body mass (Reilly et al., 2016). More hands-on training and increased lean body mass may increase the likelihood of successful OPPATTM performance; however, more work is needed to understand how other factors, such as movement technique, can improve females' physical readiness for paramedic work.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

1E01: Relationships Between Post-traumatic Stress Injury Symptoms, Reactive and Diurnal Cortisol, and Lethal Force Errors among Police

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Introduction: Errors in lethal force by police are met with demand for explanations as to why they occur. Research shows that repeated and prolonged exposure to potentially psychologically traumatic work-related encounters result in posttraumatic stress injuries (PTSI, i.e., increased symptoms of depression, anxiety, posttraumatic stress disorder (PTSD)), dysregulated cortisol, and performance deficits including lethal force decision-making (LFDM). While previous studies link biological stress responses to performance errors, whether biological and/or psychological variables predict police LFDM errors remains unclear. The current completed study tests the relationships between the most comprehensive set of psychological, biological, and behavioural data in a large, combined sample of active-duty police officers during stressful critical incident (CI) scenarios. We hypothesized that officers who committed LFDM errors would show higher PTSI scores and dysregulated diurnal and reactive cortisol.

Methods: Using a cross-sectional design, four samples of active-duty frontline ($n = 57$) and tactical ($n = 44$) police officers were tested. Psychological outcomes included: self-reported pre-CI stress, PTSI symptoms of depression, anxiety, PTSD, and operational and organizational stress. Biological outcomes included: diurnal (cortisol awakening response (CAR)) and reactive (change in pre-to-post CI (Δ CI)) cortisol. Depending on normality criteria, logistic binary regressions or Wilcoxon Signed Rank tests were used to determine whether outcomes predict or differed between officers that did or did not commit LFDM errors. The direction and strength of associations among all outcomes were explored using Spearman correlations.

Results: Self-reported preCI stress and PTSI scores did not significantly differ between officers that did or did not commit LFDM errors. Of the biological variables, only CAR significantly predicted LFDM errors ($p=0.02$). We provide novel evidence for significant relationships between CAR and PTSD ($r=-0.23$, $p=0.03$) and anxiety ($r=0.28$, $p=0.01$). Consistent with prior literature, PTSI scores were strongly positively correlated ($ps<0.001$).

Conclusions: Partially confirming our hypotheses, we provide novel evidence for increased risk of committing LFDM errors

during simulated CIs among officers with dysregulated diurnal cortisol. However, we caution that these findings are heavily influenced by outliers and biological measures of reactive cortisol may be too slow to predict performance errors during acutely stressful police operations. While psychological symptoms do not appear to interfere with LFDM, it remains

untested whether these variables degrade other physical or cognitive skills essential for effective policing, including situational awareness or de-escalation. These findings support investment in evidence-based training and interventions to improve both biological and psychological indicators of health, which in turn can reduce police errors in LFDM.



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HEALTH SERVICES

Podium Presentations

2A03: Does Recommended Mental Health Follow-up Care Occur After Post-deployment Screening in the Canadian Armed Forces? A retrospective cohort study

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Introduction: Military personnel encounter unique experiences during their service, experiences that can contribute to their risk of developing mental health problems. The Canadian Armed Forces (CAF) implemented the enhanced post-deployment screening (EPDS) program in an effort to facilitate early detection and care-seeking for its members with a need for services following their deployment. While screening's effectiveness is reliant on a series of processes occurring as planned, one important process involves members following through on any indicated recommendations for follow-up care. However, the degree to which members adhere to this follow-up recommendation is currently unknown. A characterization of this adherence and its influencing factors would be beneficial in identifying how the screening process could be augmented to improve this adherence for the benefit of CAF members.

Methods: The study used a retrospective cohort of CAF personnel (n=28,460) who had deployments over 2009-2014; inferences were based on a probabilistic sample but focused on members whose completed EPDS resulted in a recommendation for mental health services follow-up (sample n=316 (weighted n=2034) or 11.2% of screenings). Adherence to the follow-up recommendation was assessed within 90 days of the recommendation, a preferred delay, and within 365 days, a delay considered partially associated with the screening recommendation. Adherence was determined by chart audit. Logistic regression assessed predictors of 90-day adherence to the screening-indicated recommendation, stratified by mental health concern level ('major' or 'minor').

Results: Adherence within 365 days of screening was 85.3% for individuals with 'major' mental health concerns, 55.7% for those with 'minor' mental health concerns, and 48.6% for those with psychosocial mental health concerns; the respective 90 day adherence fractions were 71.1%, 36.1%, and 46.8%. The factors with the most influence on a lower 90 day adherence among those with a 'major' mental health concern were screening prior to 2012 and deployment durations greater than 180 days. Among those with a 'minor' mental health concern, the most influential factors on a lower 90 day adherence were English first-language, Reserve Force component, Navy and to some degree, Army service, married or single marital status, and combat arms occupations.

Conclusions: On an individual level, screening has the potential to identify when an apparent care need is present and a follow-up assessment can be recommended; however, while perfect adherence to this recommendation is not expected, administrative checks and possibly, process refinements would be beneficial to ensure that all steps in this process run as intended and that care-seeking barriers are minimized.

2E04: Assessing the use of Standard Diagnostic Codes for Long COVID in the Canadian Armed Forces

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Introduction: Long COVID is an emerging chronic condition that can have long-term detrimental impacts on functional outcomes. This is of particular importance for members of the Canadian Armed Forces as the effects of long COVID can impede operational readiness. Diagnosing this condition, however, can be difficult given the absence of a standard case definition. We therefore sought to examine how well long COVID is documented by comparing the use of long COVID diagnostic codes from electronic health records to case descriptions in medical charts.

Methods: The charts of all cases of COVID-19 from November 1 to 30th were reviewed to identify long COVID cases based on a definition adapted from the most recent World Health Organization (WHO) and National Institute for Health and Care Excellence (NICE) definitions. We compared the cases found from the chart review to those with long COVID diagnostic codes (code B97.2 based on ICD-10 classification) in the Canadian Armed Forces electronic health records. For the chart review, a long COVID case was categorized as such if they experienced new or persistent symptoms of fatigue, shortness of breath or cognitive dysfunction, or if a long COVID diagnosis was indicated by a physician. The window for case confirmation began 28 days after the initial COVID symptom onset or date confirmed, whichever came first, and ended 84 days after the start of the long COVID period, to ensure that all cases would have the same amount of follow-up time for identification of long COVID.

Results: One hundred and thirty-three confirmed COVID-19 cases were identified and reviewed for long COVID symptoms or diagnoses. Based on the chart review, evidence of long COVID was found in nine (6.8%) records, none had a B97.2 long COVID diagnostic code. Four records (4/133, 3.0%) received a B97.2 long COVID code, but they were not classified as having long COVID based on the chart review. Therefore there was no agreement between long COVID cases identified by chart review and electronic health records, resulting in diagnostic code sensitivity of 0% and a specificity of 96.7%. The positive

predictive and negative predictive values for the use of the B97.2 code were 0% and 93.0%, respectively.

Conclusions: The B97.2 code did not accurately identify long COVID within our sample. Standard case definitions for long COVID need to be developed and disseminated in order to help guide clinicians in diagnosing the condition and improve future coding practices. Improvements in coding practices may support improved long COVID surveillance capabilities.

3B02: App-based Continuing Education: Promoting military cultural competence among service providers in a digital, asynchronous learning format

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Introduction: Service providers (e.g., social workers, therapists) working with military and veteran families need specific training to enhance their knowledge of military family life and stay apprised of best practices in service provision (Blaisure et al., 2016). Yet, estimates suggest that only 14% of mental health providers have a sufficient level of military-specific cultural competence (Tenielian et al., 2014). In response, our team developed a mobile phone application (app) that delivers military and veteran family research in an accessible and actionable format over an 8-week period; twice a week, service providers read brief summaries of research studies that offer tangible practice-related implications.

The goal of the app is to provide free continuing education to service providers while increasing community capacity for serving these families (Mancini et al., 2020). Drawing from a real-world evaluation approach (Bamberger & Mabry, 2019), we conducted a longitudinal randomized controlled trial to systematically evaluate the app.

Methods: 257 service providers were recruited across the United States through digital platforms and randomly assigned to either the treatment group ($N=161$) or the waitlist group with delayed intervention ($N=96$). Participants in both groups completed the first pre-app survey at Time 1. Treatment group participants then used the app for 8 weeks and completed a post-survey following app completion (Time 2); a follow-up survey was given 8-weeks later to assess the sustained impact (Time 3). After the Time 1 survey, participants in the control group were "waitlisted" for 8 weeks and completed another pre-app survey (Time 2); after the waitlist period, they used the app for 8 weeks and then completed the post-app survey (Time 3). All study protocols were approved by the University-review panel (IRB).

Expected Results: Guided by the Kirkpatrick and Kirkpatrick Model of Evaluation (2016), we evaluated the app at three levels: reactions to the app, learning (specifically military cultural competence), and behavioral intent to utilize the

content in their work. Overall, providers had positive reactions and showed meaningful increases in their military cultural competence and behavioral intent.

Conclusions: The results highlight the usability and effectiveness of disseminating research using a mobile phone application. Making research findings more accessible to service providers through education and outreach initiatives can assist them in implementing evidence-based practice as they provide services to families and can bolster community support for military families as more providers work to increase their knowledge base for serving military and veteran families.

Poster Presentations

P122: The Effectiveness of Physiotherapy-led Screening for Patients Requiring an Orthopaedic Intervention: A pilot study

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Introduction: In Canada, wait times for orthopedic surgery represent a significant delay in care for patients with musculoskeletal disorders. To improve access, new models of care involving physiotherapists to either diagnose, triage, and/or conservatively manage patients with musculoskeletal disorders are being implemented. The purpose of this study was to assess the effectiveness of physiotherapy-led screening of electronic medical records (EMR) using a locally developed screening tool to identify whether patients required orthopedic intervention or conservative management.

Methods: This was a prospective observational study using a time-framed sampling methodology, whereby the study sample was identified by Mar. 31, 2020, and consisted of patients (military members) scheduled for an orthopaedic consultation for any musculoskeletal condition between Apr. 1 and May 30, 2020, within Canadian Forces Healthcare Centre (Atlantic). The participant selection period was set to allow time for physiotherapists to screen files prior to the orthopaedic consultation. Sample size calculations determined that a minimum of 28 participants would be required to detect unforeseen problems in a pilot study.

The EMRs of 41 patients were independently screened by two randomly assigned physiotherapists. The corresponding patients were subsequently seen by one orthopedic surgeon. The physiotherapists screened the EMRs using a screening tool and provided triage recommendations (orthopedic intervention, physiotherapy, psychiatry, diagnostic investigations, or other intervention). Percentage of agreement and Fleiss' kappa were calculated to assess inter-rater

agreement, and validity was determined by cross-tabulation.

Results: The percentage of agreement for triage recommendations among physiotherapists was 78% and inter-rater agreement was moderate ($\kappa = 0.617$; 95% CI, 0.365–0.868, $p < 0.001$). Excluding recommendations for diagnostic investigations increased the percentage of agreement to 93.9% and resulted in a strong level of inter-rater agreement ($\kappa = 0.878$; 95% CI, 0.537–1.219). The screening tool was determined to have 64.0% sensitivity, 87.5% specificity, a positive predictive value of 88.9%, and a negative predictive value of 63.2%.

Conclusions: The results of this pilot study support the use of physiotherapy-led screening of EMRs to determine whether patients would benefit from conservative management or orthopaedic intervention. Training on the use of the screening tool to promote standardized application and consistency of treatment recommendations should be taken into consideration. To improve the use of screening, further clarification on when to recommend diagnostic investigations is required. EMR screening by physiotherapists is a promising strategy in identifying musculoskeletal disorders that would be more appropriately managed with conservative treatment; however, further research in this area is required.

P129: National Capital Region: A Surge of Pharmacist Prescribing Amidst the COVID-19 Pandemic: Are they now Endemic (i.e. Here to Stay)?

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¹Canadian Forces Health Services Group

Program/Intervention Description: In 2015, an expanded scope of practice was approved for pharmacists practicing within the Canadian Forces Health Services. Five specific prescribing activities were authorized, namely: adapting a prescription; renewing a prescription; prescribing in an emergency; prescribing for approved conditions (i.e. minor ailments); and therapeutic substitution. This new policy was initiated to ensure that CAF personnel would be able to access drug therapy with fewer barriers, and was similar to other initiatives occurring across Canada. Inaccessibility to access healthcare has been further exacerbated as a result of public health measures taken during the response to COVID-19. Detailed understanding of the types of prescribing activities undertaken by pharmacists, and the therapeutic categories of medications involved, will enable better tailoring of services to meet the needs of patients in future.

Evaluation Methods: Data regarding pharmacists' prescribing activities will be extracted using the pharmacy dispensing software at the Canadian Forces Health Services Centre in Ottawa, using pre-established standard report templates. These will include measures to describe the relative proportion of prescriptions and overall pharmacy transactions associated

with prescribing pharmacists. Data from the drug claims system (maintained by Medavie Blue Cross) will be analyzed to corroborate the figures generated from local records, and to enable identification of medications and therapeutic categories that are most frequently associated with pharmacist prescribing.

Results: To date, our analysis has identified a near-doubling in the proportion of pharmacy transactions (new prescriptions and refills) associated with a pharmacist prescriber. From 2016 to 2019, pharmacists were noted as the prescriber on just 5-7% of all transactions dispensed per year, compared to over 13% in the years since. Additional analysis of prescribing activities, and further investigation regarding the types of medications prescribed, is expected to yield further insight regarding the burden of pharmacist prescribing that is associated with management of acute conditions (minor ailments and emergency treatments) as compared to ensuring continuity of care through renewal of prescriptions, therapeutic substitutions, and adaptation of therapy.

Conclusions: Controlled prescribing by pharmacists has allowed a greater proportion of CAF personnel in Ottawa to maintain access to drug therapy despite restrictions imposed to limit the spread of COVID-19. Improved awareness of the types of prescribing activities being performed, and the categories of medications most commonly prescribed by pharmacists, will enable pharmacy services to be better focused, and ensure that the pharmaceutical needs of patients are addressed in a safe, effective, and efficient manner.

P130: The Journey to Achieving Improved Integrative Approaches: A proposed frontline interdisciplinary team reasoning and decision-making model

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Program/Intervention Description: Unexpected, rapid change and clinical situation complexities are continually rising. A call for a more integrative approach to care delivery was made by the Surgeon General's Integrated Health Strategy (National Defence, 2017, p. 6). Additionally, paragraph 4.42 of the 2007 Auditor General's Report (Office of the Auditor General of Canada, 2007) identified the need for best practice multidisciplinary case reviews. Frontline healthcare interdisciplinary teams require robust, flexible reasoning and decision-making models adaptable to ever-changing needs. Furthermore, physical, emotional, mental, and spiritual health are undividable within a person, integral to respecting diversity, and must be considered in shared clinical reasoning and decision-making. Through the collaborative experience of developing an emerging preliminary model, this poster

aims to highlight clinical reasoning and decision-making theories to inform improved evidence-based decision-making, policy, and clinical practices.

Evaluation Methods: University of British Columbia's Master of Rehabilitation Science demands diverse learners establish a model to guide or enhance reasoning, decision-making, and reflection in practice. The Interdisciplinary Circular Reasoning Model (ICRM) was developed by 5 participants applying evidence-based clinical reasoning and decision-making theories through a three-step process outlined by Jaccard & Jacoby (2010), as cited in Elvén, Hochwälder, & Söderlund, (2015). A visually clear, user-friendly design was critiqued by 10 independent learners well-versed in clinical reasoning and decision-making theories. The strength of the critiques stemmed from two focus groups' diverse backgrounds, life and healthcare work experiences in the application of two practice scenarios.

Results: The ICRM effectively supported diverse interdisciplinary team participants navigating complex, multidimensional practice scenarios reflective of clinical reasoning in today's healthcare environment. The model's non-hierarchical design demanded all criteria be considered equally. Its aim of a personalized approach, aiding in the coordination of care between the patient and their healthcare team (The Health Foundation, 2016) while encouraging metacognition and self-reflection (Vo, Smith, & Patton, 2019) resonated in the qualitative feedback. Its adaptability towards changing healthcare landscapes, new healthcare models, evolving technologies or knowledge, and rapid and unpredictable change was also acknowledged.

Conclusions: Preliminary application of the ICRM promoted improved communications and collaborations promoting personalized, quality decision-making and heightened understandings in complex scenarios interdisciplinary teams commonly tackle today. The model could be considered by interdisciplinary teams caring for complex clinical profiles, including other countries with similar demographics and resources.

PRIMARILY MENTAL HEALTH & WELL-BEING

Podium Presentations

1A03: Trends in Addictions Referrals to Mental Health Service among Canadian Armed Forces Personnel: Impact of cannabis legalization on demand for service

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Introduction: Addictions is prevalent among military populations and left untreated, it can lead to a number of negative health

impacts including self-harm. Analysis of administrative health data can inform the scope of addictions-related health services utilisation and pave the way for future studies evaluating to effectiveness of addiction treatment. This study sought to assess the impact of cannabis legalization in Canada on the demand for addictions treatment at CAF mental health clinics.

Methods: Administrative records from mental health referrals and intake screenings were used in this study. Analysis was based on data extracted over a 5-year period from January 1 2017 to December 31, 2021. Text mining strategies were developed and validated to identify addictions related referrals and pre-established clinical impression codes were used to identify relevant records. Descriptive analyses were conducted to derive demographic characteristics of those seeking treatment for addictions related consultations. Patterns of use was quantified using the slope of the linear trends and estimated annual percent changes for addictions related consultations for different substances such as alcohol, cannabis, opioids and illicit drugs. Significance was determined a priori using alpha of 0.05 level.

Results: Overall, the proportion of mental health referrals with substance related use mentioned remained stable ($p > 0.05$). Over the study period, 3753 personnel were identified among mental health referrals for addictions related consultations. Of these, Regular Forces made up the majority of the reports (91%) and 87% were males. Alcohol was by far the most common substance responsible (58%) followed by cannabis use (32%). With legalization of cannabis in 2018, the number of referrals with cannabis use mentioned spiked in 2019 and eclipsing alcohol in 2020. The slope of the regression for cannabis showed an increase of 187 consultation annually for the study period ($p < 0.5$).

Conclusions: Screening and treatment for addictions remains an important component of the health care services among the Canadian Armed Forces personnel. While this analysis confirms alcohol as a leading contributor to addictions related mental health consultation, the increasing trend of cannabis use associated with referral for addiction services warrants further examination to understand root causes.

1A05: Dialectical Behaviour Therapy Skills Training: A feasibility study with active-duty military

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Program/Intervention Description: Dialectical Behaviour Therapy (DBT) skills training is an evidence-based intervention for patients with emotion dysregulation and personality disorder/traits. There is a dearth of research investigating DBT with active-duty military populations. The purpose of this study was to develop and evaluate the feasibility of a DBT skills training group for active-duty military members.

Evaluation Methods: This DBT skills training group is a 16-

week program based on Linehan (2015) that teaches four core skills: mindfulness; distress tolerance; emotion regulation; and interpersonal effectiveness. A quasi-experimental design was used which included pre- and post-treatment questionnaires as well as a focus group discussion. Participants completed the Patient Health Questionnaire (PHQ-9), General Anxiety Disorder Scale (GAD-7), Difficulties in Emotion Regulation Scale (DERS) and Borderline Evaluation of Symptoms over Time (BEST).

Results: $N = 15$ patients were referred to the group, $N = 6$ dropped out, and $N = 9$ completed treatment. Two main themes emerged from the focus groups which highlight positive responses to group sessions and learning new skills. Paired t -tests indicated that depression, anxiety, and emotion dysregulation all significantly decreased with treatment (PHQ-9, GAD-7 and DERS, $p < 0.01$).

Conclusions: Follow-up evaluation with participants at six months post treatment found that treatment gains were largely maintained, except anxiety. Participants reported in a survey and group feedback session that they learned helpful coping skills, particularly emotion regulations skills which they planned to continue using and found the group setting beneficial. The findings from the study suggest the feasibility of DBT skills training groups among active-duty military members.

2A01: Recommendations for Care During Post-deployment Screening in the Canadian Armed Forces: Does self-reported mental health predict referral decisions?

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Introduction: Canadian Armed Forces (CAF) Enhanced Post-Deployment Screening (EPDS), which occurs between 90 and 180 days following overseas deployments of 60 days or more, aims to facilitate early care for members with mental health issues. The EPDS consists of a questionnaire to screen for mental health issues, followed by a semi-structured interview with a health care provider in which recommendations for follow-up care are provided if needed. While the questionnaire can serve as a tool to support decision-making of clinicians, the extent to which self-reported mental health is associated with decisions to recommend care is unknown.

Methods: Using EPDS data collected from CAF members who deployed in support of the mission in Afghanistan from 2009-2012 ($n=14\ 957$), logistic regression analysis was conducted to examine the association of self-reported mental health from the screening questionnaire (depression, posttraumatic stress disorder (PTSD), anxiety, panic disorder, alcohol use and psychosocial stressors) with recommendation for follow-up mental health care during the interview. Sociodemographic and military characteristics and mental health care history were included as covariates.

Results: In total, 7.1% of screened individuals were recommended for follow-up mental health care. In the adjusted logistic regression model, there was no association between sociodemographic and military characteristics or deployment stressor level with recommendation for follow-up; however, prior mental health care and self-reported mental health problems had a substantial association. Marginal prevalence estimates indicated that, compared to each mental health problem's lowest severity category, recommendation for follow-up care was higher by 5.0% to 7.9% for those with mild to severe depression, 2.4% for those with panic disorder, 4.4% to 6.2% for those with mild to severe anxiety, 1.6% and 4.6%, respectively, for those at medium and high risk for alcohol use disorder, and 1.8% and 4.4% for those at medium and high risk, respectively, for PTSD.

Conclusions: Although the presence or risk level of mental health problems was significantly associated with receiving a follow-up recommendation, the associations between self-reported mental health and subsequent recommendations for care were not as high as might be expected. In part, this may reflect time delays between the questionnaire and interview. As well, the relative extent to which questionnaire results, responses to interview questions, members' preferences regarding care, or other factors not measured, contributed to referral decisions is unclear. Understanding factors that influence recommendations for care during screening can help to identify opportunities to enhance the screening process and ensure that care is received early when needed.

2A02: Association of Clinician Impressions With Recommendations for Follow-up Care during Post-deployment Screening in the Canadian Armed Forces

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Introduction: Enhanced Post-Deployment Screening (EPDS) in the Canadian Armed Forces (CAF) aims to facilitate early access to care for those with mental health issues. The EPDS process consists of a questionnaire to screen for mental health issues, followed by a semi-structured interview during which clinicians indicate their assessment of mental health concerns and make recommendations for follow-up care as needed. Examination of the relationship between self-reported mental health and clinicians' recommendations for care has yielded lower than expected associations. To better understand this, we examined the associations between self-reported mental health and clinician concerns for specific mental health issues, and between these concerns and recommendations for care.

Methods: Using EPDS data collected from CAF members who deployed in support of the mission in Afghanistan from 2009-2012 ($n=14\ 957$), descriptive and chi square analyses were conducted to examine the association between self-reported mental health on the questionnaire (PTSD, depression, anxiety

and substance use) and clinicians' concerns (major, minor, or no concern). In addition, the association between level of concern for each issue and subsequent recommendation for care was examined.

Results: About 70% of screened individuals at high risk of depression or PTSD were rated as being of 'major' concern for that disorder by the interviewing clinician, while approximately 50% of those at high risk of generalized anxiety disorder were rated as 'major' concern. Ratings of 'major' concern for substance use among those at high risk of alcohol use disorder were lower (14%). Between 40-50% of screened individuals with clinician-indicated 'major' concern for either depression, anxiety, substance use or PTSD received a recommendation for care. Those with concerns for any mental health issue were significantly more likely to receive a recommendation compared to those with no concern.

Conclusions: Although overall, screened individuals who were indicated as being of 'major' or 'minor' concern for any of four mental health issues during their interview were more likely to be recommended for care compared to those with no concerns, it was clear that many individuals at high levels of concern did not receive a recommendation. Although some discrepancies may be due to individuals already being in care at the point of screening, analyses suggest that this does not fully explain this observation. Results are discussed in the context of discrepancies between the questionnaire and clinicians' assessment tool, the need for more standardized training, and the need to further understand the factors that drive clinicians' decisions to recommend care.

2C01: Follow-up Study of Predictors of Barriers to Seeking Support for Mental Health among Canadian Armed Forces Personnel Deployed on Operation LASER

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Introduction: A minority (21%) of Canadian Armed Forces (CAF) members who deployed to support long-term care facilities (LTCFs) as part of the national response to the COVID-19 pandemic (Op LASER) perceived a need for mental health support following the deployment. However, recognizing a need is just one step in the pathway to accessing care. Research suggests that a variety of barriers may discourage military members from seeking support for their mental health, yet, little is known about the factors that predict these barriers. Much of the research into barriers is cross-sectional and limited in scope. This study explores the

extent to which individual factors (including moral distress/injury and mental health outcomes), and organizational factors were associated with future perceptions of barriers.

Methods: Cross sectional data were collected at 3 months (T1) and 6 months (T2) after deployment on Op LASER, using electronic surveys. Mental health outcomes, moral injury and human dimensions of operations (HDO) factors were assessed using validated scales, while demographic and military factors were assessed using standard survey questions. Barriers to mental health care were assessed using items that reflected capabilities, opportunities and motivations to access care. Perceived need for care (PNC) and access to care were assessed using single items. The univariate associations of demographic characteristics, mental health, moral injury and HDO factors at T1 with barriers at T2 were examined using Pearson correlations and linear regression analyses.

Results: Greater negative mental health and moral injury scores were associated with higher barrier scores, while favourable mental health and HDO scores were associated with lower barrier scores ($p < 0.05$). Barriers related to discomfort with accessing care at work presented the strongest positive correlations with poor mental health, and the strongest negative correlations with better morale and relatedness; while barriers related to organisational and social support were strongly and negatively correlated with better trust in teams and leadership. Individuals deployed inside LTCFs compared to outside, in Ontario compared to Quebec, and who had sought help and/or reported a PNC compared to those who did not, consistently reported stronger barriers to care.

Conclusions: This study expands upon past cross-sectional research to show that individual characteristics, mental health status and organizational factors may influence the perception of barriers to accessing mental health care in the future. These findings suggest that a variety of individual and organizational factors should be considered when developing and evaluating strategies to reduce barriers to care.

2C02: Moral Distress and Moral Injury among Canadian Armed Forces Personnel following Deployment to Operation LASER

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Introduction: Elderly residents of long-term care facilities (LTCF) were particularly vulnerable to COVID-19 outbreaks and experienced subsequently high rates of morbidity and mortality, especially during the early waves of the COVID-19 pandemic. As part of Operation LASER (Op LASER; Canada's military support to the COVID-19 pandemic response), Canadian Armed Forces (CAF) personnel deployed to support

operations in LTCFs that were identified to be in greatest need across Ontario and Quebec. Due to the nature of the operation (e.g., witnessing the suffering of others), it was recognized that moral dimensions would be invoked, and in turn, moral distress and injury may be of particular concern for those deployed. To date, the pattern of exposure to potentially morally distressing experiences during this deployment and their impact on adverse moral injury outcomes are unknown.

Methods: CAF members deployed to LTCFs as part of Op LASER were invited to participate in an online, longitudinal, 3-time-point, multifaceted survey at approximately 3, 6, and 12 months post-deployment. Included as part of the survey was an assessment capturing potential exposures to morally challenging situations specific to the Op LASER LTCF context and corresponding degree of moral distress associated with each experience (adapted Measure of Moral Distress; MMD-LASER). A newly-developed, gold-standard scale assessing multidimensional adverse outcomes for moral injury, Moral Injury Outcome Scale (MIOS), was also administered (measuring magnitude of shame-related and trust-violation-related outcomes (e.g., social impairments, impaired moral emotions).

Results: Preliminary analyses indicate that approximately three-quarters of the sample reported exposure to at least one potentially morally distressing Op LASER event. The highest proportion reported morally distressing exposures related to resident care, but communication and CAF support issues were also prevalent. Those deployed inside the LTCFs reported a greater number of, and high or extreme levels moral distress in response to morally challenging experiences during the deployment, relative to those outside the LTCF. Approximately 25% of respondents indicated that the most morally injurious event of their life occurred during Op LASER. Moral violations endorsed by participants most often overlapped across witnessing transgressions by others and feeling betrayed. Longitudinal patterns in moral injury outcome severity across timepoints will be presented.

Conclusions: Moral distress and injury continue to be a feature of Op LASER one year after the deployment for some respondents, especially those who deployed inside the LTCF. Results have implications on processes related to mitigation, early intervention, and support for those impacted by morally distressing experiences.

2C03: Longitudinal Mental Health Outcome Trajectories among Military Personnel Deployed to Long-term Care Facilities as part of Operation LASER

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Introduction: As part of Canada's response to COVID-19, Canadian Armed Forces personnel participating in Operation

LASER (Op LASER) deployed to support civilian staff at long-term care facilities (LTCF) in Ontario and Quebec. This mission involved stressors which may be associated with adverse mental health outcomes. To determine if and when additional support may need to be provided to military personnel and whether support needs to be tailored in this and similar future deployments, we tracked mental health outcomes over time.

Methods: An online survey, including measures of negative mental health (e.g., depression, anxiety, psychological distress, posttraumatic stress disorder [PTSD]), was conducted at three time-points (T1-T2-T3:3-6-12 months post-deployment). Data were analyzed both as continuous and as categorical measures (using cut-offs of minimal, mild, moderate, and severe symptoms for all but the PTSD scale for which cut-offs of possible caseness [Yes or No] was used); a summary variable of "Any" (scoring in the "moderate-to-severe or caseness" range on any scale) was also created. Descriptive analyses and mixed linear models were conducted to identify different mental health outcome trajectories, using weights to adjust for non-response bias.

Results: Of the cohort (N=2595), 1088, 582, and 497 participated in the T1, T2, and T3 surveys (response rates: 42%, 22%, and 19%); 212 had data for all three time-points. Across all scales, the most frequently observed (67.77%-88.51%) trajectory was "Minimal-to-Mild symptoms/Not a Case" at all three time-points. Another trajectory of "Moderate-to-Severe symptoms /Case" at all three time-points was also observed for a small number (1.77% to 9.09%). Overall, those in the "Minimal-to-Mild/Not a Case" trajectory had the lowest scores at T1; those in the "Moderate-to-Severe/Case" trajectory had the highest scores at T1. For all scales except that for PTSD, as well as the "Any" summary variable, a third "Improved" trajectory (scoring in the Moderate-to-Severe range at T1 but not at T2 and T3; 3.36%-11.24%) was also detected.

Conclusions: Over 12 months post-deployment, the majority of Op LASER personnel reported minimal symptoms; a minority reported significant symptoms at T1 and of these, about half continued to report significant symptoms throughout. Current findings indicate that screening and support early in the post-deployment phase may be most helpful for individuals who may need additional supports. Ongoing analyses are aiming to identify factors that distinguish between those who remain symptomatic and those who recover.

3A01: Organizational Climate and Inappropriate Behaviours in the Defence Team: Insights from the harassment, discrimination, and misconduct research program

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Brief Description: Experiences of harassment, discrimination, and other forms of misconduct have been linked to various health outcomes. Understanding and addressing misconduct,

and the climate in which it occurs, is important to better supporting members' health. The current Department of National Defence (DND) and Canadian Armed Forces (CAF) research program on harassment, discrimination, and various forms of misconduct builds on work that goes back 30 years. The focus of this mixed-method research program has been at the level of individual behaviours and attitudes, with some research examining group behaviours, lived experiences (especially among marginalized and racialized members), and organizational/systemic barriers. A review of this program reveals a number of key insights that contribute to our understanding of organizational climate at DND/CAF as it relates to misconduct, which this presentation organizes into six broad themes: (1) prevalence of misconduct, (2) nature and impact on members, (3) support to affected members, (4) organizational/systemic barriers, (5) policy awareness and effectiveness, and (6) training interventions.

Patient Population: CAF members, DND civilians, and veterans.

Results: Prevalence of various forms of misconduct have remained largely stable over time, with some improvements noted. However, women, racialized, Indigenous, and marginalized members consistently report experiencing misconduct at a higher rate. The nature of reported misconduct today is more often (but not exclusively) described as subtle, ambiguous, and more complex to confront. Experienced misconduct can lead to negative health outcomes, as well as loss of trust, personal connection, experienced organizational barriers, and loss of organizational commitment. Aspects of organizational structure, warrior culture, rank hierarchies, and associated power imbalances can cause barriers to effective support and support seeking, which can cause secondary harm and reinforce personal and institutional impacts. Members of equity seeking groups consistently report encountering employment barriers, particularly related to career advancement, reinforcing the need to investigate organizational structures through an intersectional lens. Awareness of policy has remained stable, suggesting a gap between policy interventions and their influence on behaviours. Training interventions have had mixed results, with effectiveness influenced by factors such as bystander gender and rank, the behaviour type, and context in which it occurs.

Conclusions: Several themes emerge from our research program, which provide insights that help to describe the contours of organizational climate at DND/CAF, as it relates to misconduct. This understanding may inform explorations of Defence Team member health, given the established links between experienced misconduct and negative health outcomes. Our research program continues to mature, and directly supports these efforts.

3A04: Organizational and Personal Factors Associated With Turnover Intentions Among Women in the Canadian Armed Forces

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Introduction: There are both long-standing (e.g., compliance with the Employment Equity Act) and renewed (e.g., in Strong, Secure, Engaged) commitments to increase the representation of women in the Canadian Armed Forces (CAF). Critical to these commitments is an understanding of the factors associated with turnover intentions among women in the military. For instance, research has suggested that turnover intentions among women in the military are associated with the degree to which the needs of members and families are effectively addressed. There is also evidence that the factors associated with turnover intentions among women in the military may vary depending on their family composition. The current study sought to explore factors associated with turnover intentions among women in the CAF with different family compositions.

Methods: Using data ($n = 282$) provided by women responding to the 2020 Organizational Effectiveness Your Say Survey, multiple linear regression analyses were conducted for four types of family compositions (single – with children, single – without children, married – with children, and married – without children). Organizational factors (including perceived organizational support for members and their families and high workload) and personal factors (including work-life balance and family support for the member's career) were assessed to determine if these factors are predictive of turnover intentions for the four subgroups of women.

Results: Organizational factors (e.g., perceived organizational support for members and families) were significantly associated with lower turnover intentions among single women without children, married women without children, and married women with children. However, when personal factors were added to the model, this association only remained significant for married women with children. For married women without children, family support for the member's career held the strongest association with lower turnover intentions. For single women without children, the ability to maintain a balance between one's personal and work life held the strongest association with lower turnover intentions.

Conclusions: Findings suggest that the factors most predictive of women's turnover intentions may depend on their family composition. While organizational factors were associated with lower turnover intentions for married women with children, balance between one's personal and work lives was associated with lower turnover intentions among single women without children, and family support for the member's career was associated with lower turnover intentions among married women without children. Further research is needed to explore

additional factors (e.g., organizational conduct and culture) that may be associated with the turnover intentions of women in the CAF.

3A05: Feeling Psychologically Safe in the Military: Development and Validation of the Psychological Safety Inventory

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Introduction: Feeling psychologically safe, whether at an individual or organizational level, is vital for organizational effectiveness. Given the importance of military organisations' ability to adapt quickly to fluctuating and demanding conditions, it is imperative that teams foster high levels of psychological safety, defined as perceptions that the individual within a team and organization is supported and feels safe in tackling emerging challenges. However, there is no consensus on how psychological safety should be measured in an occupational setting. Here, we develop a self-report measure of psychological safety (i.e., Psychological Safety Inventory [PSI]) in response to the needs of organizations to accurately assess psychological safety.

Methods: Item generation, expert review, and initial item trimming were conducted. A preliminary, 70-item version of the PSI was administered to 497 full-time civilian employees (238 males, 248 females, 4 other, 7 missing) from Canada ($n = 113$), the United States ($n = 104$), and the United Kingdom ($n = 277$; 3 missing country) using an online survey. Participants completed the preliminary PSI, an alternative measure of psychological safety, as well as measures of leadership, team climate, organizational perceptions, and organizational support.

Results: The initial set of 102 items was generated reflecting the following domains of psychological safety: Interpersonal Risk-Taking; Mutual Trust/Respect; Organizational/Structural Support; Identity and Clarity in Context of Team; and Supportive Leadership. A total of 16 content domain (military, psychological safety) and psychometrics experts reviewed and rated items. Based on this review, we reduced the item set to 70 items. Based on exploratory and confirmatory factor analyses, we reduced the preliminary PSI to a 30-item, 5-factor scale. We further examined convergent validity of the measure and found that the PSI subscales and total scale correlated as anticipated with other measures of psychological safety, leadership, team climate, organizational perceptions, and organizational support.

Conclusions: Given the high stakes demands and extreme conditions associated with serving in the military, it is imperative that military teams function in ways that promote psychological

safety. However, to enhance levels of psychological safety in the military, valid and reliable psychometric tools must be implemented to measure the construct accurately. Based on our analyses, the PSI is a valid and reliable measurement tool designed to evaluate levels of workplace psychological safety. Future research should ensure that the demonstrated validity of the PSI holds in the CAF population and context.

3B01: Examining the Relationship between Sense of Belonging and Perceived Health and Well-being in Canadian Army Reservists

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Introduction: Primary Army reservists navigate two worlds, continually moving between military and civilian contexts. They have ties to their local community and to reserve regiments with long histories and traditions connecting unit members. Reservists are also a part of the Canadian Armed Forces (CAF) more generally.

This research looked at the relationship between sense of belonging (i.e., local community, reserve unit, and CAF) and health and well-being. Social support and resilience were explored as possible mechanisms explaining any obtained relationships between sense of belonging and health/well-being.

Methods: Canadian Armed Forces (CAF) Primary Army Reservists ($n = 1,154$) completed an anonymous survey of Army reservists' health and well-being. They completed measures assessing:

1. Sense of belonging to the local community, reserve unit, and CAF were assessed via one item each.
2. Resilience (i.e., ability to bounce back or recover from stress) was measured using the Brief Resilience Scale.
3. Social support was measured using a shortened version of the Social Provisions Scale which assesses attachment, social integration, assurance of worth, reliable alliance, and guidance support.
4. A composite measure of overall well-being was developed using the Mental Health Continuum – Short Form which has items measuring emotional, psychological, and social well-being.
5. Mental and physical health were each assessed by one item with a similar format (e.g., "In general would you say your physical health is...?").

The sample was split into exploratory and confirmatory samples. Path analyses were run, and re-run on the samples. A prototypical path model had a sense of belonging dimension, resilience and social support as possible mediators, and a health/well-being outcome, while controlling relevant demographic variables. The strength of significant mediators was also assessed.

Results: A sense of belonging to the local community was consistently related, and sense of belonging to a reserve unit was somewhat related to health and well-being, and this was partially due to the mediating role of resilience and social support in these relationships. No consistent evidence for mediation was obtained in the case of sense of belonging to the Canadian Armed Forces.

Conclusions: Findings suggest a sense of belonging to the community and reserve unit play a positive role in enhancing the health and well-being of Canadian Army reservists.

3B05: Experiences of Afghan-Canadian Language and Cultural Advisors Who Served with Canadian Forces Abroad

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Introduction: In response to the events of September 11, 2001, the Canadian Armed Forces (CAF) joined other countries in conducting operations in Afghanistan, sending around 40 000 members, for a span of over twelve years. Although Canada's combat role in Afghanistan ended in 2011, members of the CAF remained in the country training Afghanistan's army and police force until March 2014. During this time, the CAF relied on Afghan interpreters not only for translation but to also assist in teaching the local culture and customs to CAF members. Along with local Afghan interpreters, the Department of Defense (DND) also recruited Afghan-Canadian citizens to work as Language and Cultural Advisors (LCAs), where they deployed with the CAF and accompanied soldiers outside the wire. Exposed to potentially traumatic events, little, if any, published literature currently exists in relation to the experiences of these LCAs.

This ongoing study, which is guided by an advisory committee, aims to identify the current mental health status of Language and Cultural Advisors who served with the CAF in Afghanistan, their perception of their experience and transition back to civilian life, and the types of supports they perceive they would have needed upon their return. This presentation will share the preliminary results of the study, as well as describe the process of working with an advisory group from the inception of the study.

Methods: Along with an initial demographic questionnaire and the PCL-5, semi-structured qualitative interviews are currently taking place with former Language and Cultural Advisors who served with the Canadian Armed Forces abroad. Members of the advisory committee, which includes a member of the Afghan-Canadian community, and a former LCA, are leading the ongoing recruitment of participants. Once completed, the transcripts of these interviews will be analyzed and coded, guided by an interpretive phenomenological analysis approach.

Expected Results: At the conclusion of the study, we are

expecting to be able to discuss how LCAs experienced their work, and discuss the social and health-related impacts which LCAs attribute to these experiences. We are also hoping to provide useful information on resources and/or services Afghan-Canadian civilians who deployed with the Canadian Armed Forces would have found useful during their transition back to civilian life.

Conclusions: Language and Cultural Advisors played an important part of Canada's operations in Afghanistan. This study is an important first step in building a foundation of evidence to help inform the potential, future creation of adapted resources and services.

3C02: Enhancing Fidelity of Implementation of the Road to Mental Readiness Program

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Program/Intervention Description: For more than ten years the Canadian Armed Forces has focused on developing and implementing an evidence-based comprehensive mental health training and education program designed to increase mental health literacy, enhance resilience and build mental toughness in order to ultimately improve short term performance and mental health outcomes for service personnel and their families. Since its inception, the Road to Mental Readiness (R2MR) program has improved service members' mental health literacy, confidence to manage stress, positive coping strategies, ability to recognize the need for mental health support and has led to early care seeking by service personnel experiencing challenges (Fikretoglu, et al, 2016; Zamorski, et al, 2012; Zamorski, 2018; Khan, 2015; Fikretoglu, 2018; Lee, 2018). While the program has expanded at a rapid rate, a large randomized control trial identified that fidelity of implementation (FOI) issues were impacting outcomes (Fikretoglu, 2018). A lack of FOI within the R2MR program undermines standardization, makes it difficult to interpret evaluation findings, and, at best, reduces the chances of achieving the desired results or, at worst, produces results that negatively impact performance and well-being.

Evaluation Methods: In response to the findings regarding FOI, a literature review was conducted to identify the factors that influence program fidelity and possible courses of action to enhance FOI. Several areas for program improvement were identified including pre-training activities (selection and screening, pre-course activities, core concepts and differentiation, training aids), in-class (practice and modelling, fidelity risk assessments, mapping of course objectives to a behavioural determinants intervention model), and post-training (proactive technical assistance, coaching, refresher training, fidelity monitoring).

Results: A new approach to instructor training, Fidelity Focused Instructor Training (FFIT), has been developed and implemented

to address many of the pre-training and in-class factors that have been demonstrated to impact FOI. This presentation will present an overview of the FOI measures that have been implemented and preliminary data on the FFIT model.

Conclusions: FFIT aims to prepare instructors, at all levels, to deliver the critical components of the R2MR program/ curriculum as intended while effectively leading activities that reinforce learning, thereby increasing the likelihood that R2MR sessions will be delivered under high fidelity conditions and contribute to program objectives.

3C04: Patient-reported Outcome Measures for Progress Monitoring and Treatment Evaluation of Depression (PROMPT-D) Feasibility Study

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Introduction: Depression is a common, chronic, relapsing and debilitating mental disorder, which can negatively impact the quality of life and ability to work for members of the Canadian Armed Forces (CAF). Current evidence based practice guidelines for the management of depression endorse the use of patient-reported outcome measures (PROMs) to inform and evaluate treatment. Evaluation of the effectiveness of antidepressant treatments in depressed CAF service members requires the development of clinical trials in which PROMs are consistently used at key time points during and after the completion of antidepressant treatment. However, assessing the feasibility, reliability, and validity of such clinical trial designs require small scale feasibility studies as an essential pre-requisite to their successful planning and implementation.

Methods: Patient-Reported Outcome Measures for Progress Monitoring and Treatment Evaluation of Depression (PROMPT-D) is a multi-site, prospective, observational feasibility study of depression treatment effectiveness through routine mental health clinical practice. It involves the collection of repeated PROMs over a period of 12 weeks that will provide estimates of unknown variables needed to plan a subsequent larger trial. This study will enroll 50 CAF service members diagnosed with depression at 4 mental health clinics across Canada. Participants will have access to NexJ Connected Wellness, an online platform for population health management, to complete electronically delivered questionnaires at key time points during the study period. Approvals of the study protocol as well as informed consent documents will be obtained from the Defence Research Development Canada Human Research Ethics Committee prior to enrolling first study participant.

Expected Results: This feasibility study will (1) provide estimates of participant eligibility, recruitment, lost to follow-up, response rates and adherence to study protocol and

prescribed treatments, (2) assess barriers and facilitators to engagement with the NexJ Connected Wellness online platform for completing questionnaires during the participation in the study, (3) quantify the level of incomplete outcome data, and (4) identify potential problems that could hamper the implementation of the subsequent larger trial as well as the most appropriate mitigating solutions. Outcomes will be measured through descriptive statistics and qualitative analysis.

Conclusions: PROMPT-D feasibility study will inform the development of a future larger clinical trial that will assess the effectiveness of antidepressant treatment in depressed CAF service members through routine mental health care augmented by the use of repeated PROMs. The main findings of this study will be presented in manuscript form and disseminated as oral and abstract presentations at national and international fora.

3C05: Evaluation of an Acute Stress Reaction intervention tailored to Special Operations Forces members

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Program/Intervention Description: Despite a precise and in-depth selection process and extensive training, Special Operations Forces (SOF) members may be more at risk of experiencing and/or witnessing an acute stress reaction (ASR) while on operations and/or high-risk training, which may significantly impact a small team's well-being and effectiveness, and may compromise mission success. Based on the U.S. Army's iCOVER program, the Canadian Special Operations Forces Command (CANSOFCOM) psychological health team developed an adapted version of the ASR intervention program entitled "Back from the Black" (BFB). This study evaluated the acceptability of the BFB training program, and its effectiveness at educating CANSOFCOM members about ASRs and teaching them how to effectively respond in ASR situations.

Evaluation Methods: Participants included two groups of CANSOFCOM members in various SOF occupations who completed the BFB program as part of a larger peer support program as well as in pre-deployment training for one CANSOFCOM unit. Data were collected from 36 respondents who completed a battery of ASR-related measures (including experience with, knowledge about, and attitudes toward ASRs) pre- and post-training.

Results: Results indicated that more than half of participants had witnessed ASRs, while a small proportion reported experiencing an ASR themselves. There were no statistical differences between operators and supporters who reported witnessing or having experienced an ASR. Additionally, assessments of

differences between pre- and post-training suggested that the BFB program was effective at increasing knowledge about ASRs, improving attitudes about ASRs, and was perceived as useful, important, and of benefit to CANSOFCOM members.

Conclusions: Findings highlight the need for ASR training among SOF organizations in order to equip members with the proper tools to intervene in case of ASR. Recommendations are provided to enhance and supplement the evaluation of BFB, and to implement BFB across CANSOFCOM. Ultimately, the BFB training program may help decrease the likelihood of psychological health issues following high-stress events in training and/or operations, normalize ASR reactions among CANSOFCOM members, reduce the risk of post-incident symptoms (e.g., guilt, isolation), and maintain operational effectiveness.

4A01: The Effects of Encountering Children Recruited and Used as Soldiers on the Well-being of Military Personnel: A systematic review

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Introduction: Military personnel disproportionately report high exposures to potentially psychologically traumatic experiences. A documented source of trauma for military personnel is encountering children recruited and used as soldiers. Given that seeing children in the throes of violence can prompt difficult moral reactions, these encounters can have devastating short- and long-term consequences on the mental and physical well-being of military personnel, as well as influence their social relationships, occupational outcomes, and possible moral injury development. This presentation will describe the design, implementation, and preliminary evidence of a systematic review that evaluates the diverse outcomes reported by military personnel who have encountered children recruited and used as soldiers in their lines of duty. In addition, the review will identify the presence and absence of training programs, policies, and support services available to military personnel in preparation or response to these exposures.

Methods: This systematic review was conducted using PRISMA guidelines. The search used the databases PsycINFO-OVID and ProQuest Dissertations & Theses. In addition, The Defense Technical Information Centre was used to extend the search into existing military databases. The search strategy yielded 2807 articles for this review.

Expected Results: From each study, the following information will be extracted: (1) characteristics of the military personnel

involved in the encounter with children recruited and used as soldiers (e.g., gender, citizenship), (2) the type of data collected about the interaction (e.g., single person account via interview), (3) information about whether any training or mental health treatments are available for the military personnel (e.g., whether military personnel sought any treatment, any mention of recommendations and/or suggestions), (4) information about the encounter with the child (e.g., characteristics of the child, context of the encounter), and (5) any outcomes the military personnel experienced as a result of the encounter with the child (e.g., psychological, physical).

Conclusions: This systematic review will overview the availability of evidence on examinations of acute and long-term effects that encounters with children recruited and used as soldiers have on military personnel. The identification of important training, policies, and services will be considered in light of the consequences of these potential exposures. Together, findings will provide insights for future training, treatment, and policy recommendations in order to build capacity to support the well-being of military and Veteran populations in anticipation of these encounters.

4A04: Moral Wounds Run Deep: Exaggerated Midbrain Functional Network Connectivity across the Default Mode Network in Post-Traumatic Stress Disorder

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Introduction: A moral injury (MI) may occur when a deeply held moral code has been violated, which can result in post-traumatic stress disorder (PTSD) symptom development. Despite this knowledge, the neural correlates differentiating MI and PTSD remain largely unknown. Intrinsic connectivity networks (ICNs) – like the default mode network (DMN) – appear altered in participants with PTSD who have endured MIs. However, brainstem, midbrain, and cerebellar systems are rarely integrated into the ICNs, a critical oversight since these systems display marked differences in PTSD and are thought to be involved in the expression of strong moral emotions like shame, guilt, and betrayal.

Methods: We conducted an independent component analysis on data generated during script-driven, MI-related memory recall in participants with military- and law enforcement-related PTSD (N = 28), participants with civilian-related PTSD (N = 28), and MI event-exposed, healthy controls (N = 28). Functional network connectivity differences were compared group-wise across a DMN-correlated independent component, with a

particular focus on brainstem, midbrain, and cerebellar systems.

Results: We revealed stronger midbrain periaqueductal gray ($t(71) = 4.95$, $pFDR = 0.028$, $k = 39$) and cerebellar lobule IX ($t(71) = 4.44$, $pFDR = 0.046$, $k = 49$) functional network connectivity in participants with civilian-related PTSD as compared to MI event-exposed, healthy controls, as well as a trend toward stronger midbrain periaqueductal gray ($t(71) = 4.22$, $pFDR = 0.076$, $k = 60$) functional network connectivity in participants with military- and law enforcement-related PTSD as compared to healthy controls.

Conclusions: These results corroborate previous work demonstrating that participants with PTSD reveal stronger periaqueductal gray activation, as well as stronger periaqueductal gray functional connectivity with the DMN. Taken together, these findings provide strong evidence that, in PTSD, the DMN – a network dominated by higher-level, cortical systems – may be biased toward lower-level, midbrain systems. These lower-level, midbrain systems provide the neurobiological basis underlying shame and other strong moral emotions observed commonly post-MI, highlighting the depth at which MIs are represented neurobiologically. More broadly, these results highlight the significant and yet under-investigated role brainstem, midbrain, and cerebellar systems have toward the ICNs, which, in the present case, were the systems demonstrating the strongest PTSD-linked differences.

4A05: Moving Toward and Through Trauma: Participant Experiences of Multi-Modal Motion-Assisted Memory Desensitization and Reconsolidation

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Introduction: Military members and Veterans are at risk of developing combat-related, treatment-resistant posttraumatic stress disorder (TR-PTSD) and moral injury (MI). Conventional trauma-focused therapies (TFTs) have shown limited success. Novel interventions including Multi-modal Motion-assisted Memory Desensitization and Reconsolidation therapy (3MDR) may prove successful in treating TR-PTSD. The purpose of this study was to qualitatively examine the experiences of Canadian military members and Veterans with TR-PTSD who received the 3MDR intervention.

Methods: This study explored qualitative data from a larger mixed-method waitlist control trial testing the efficacy of 3MDR in military members and veterans. Qualitative data was recorded and collected from 3MDR sessions, session debriefings and follow-up interviews up to 6 months post-intervention; data was then thematically analyzed and resulting themes were reported.

Results: Three themes emerged from the data: (1) The Participants' Experiences with 3MDR; (2) Perceived Outcomes of 3MDR; and (3) Keys to Successful 3MDR Treatment. Participants expressed that 3MDR provided an immersive environment, active engagement and empowerment. The role of the therapist as a coach and "fireteam partner" supports the participants' control over their therapy. The multi-modal nature of 3MDR - combining treadmill-walking toward self-selected trauma imagery with components of multiple conventional TFTs - was key to helping participants engage with and attribute new meaning to the memory of the traumatic experience.

Conclusions: Military members and Veterans are at risk of developing TR-PTSD, with worse outcomes than in civilians. Preliminary thematic analysis of participant experiences of 3MDR indicate that 3MDR has potential as an effective intervention for combat-related TR-PTSD, with significant functional, well-being and relational improvements reported post-intervention. Further research is needed to explore the mechanism of 3MDR's efficacy, and its use with other trauma-affected populations.

4B01: Global Therapist and Operator Experiences Utilizing Virtual Reality for Treatment of Combat Related Post-traumatic Stress Disorder amongst Military and Veteran Populations

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Introduction: The provision of mental health services to military and veteran populations has been demonstrated to increase the risk of secondary traumatic stress (STS) to service providers. Efforts are needed to examine the impact on service providers of delivering current and novel interventions such as Multi-modal Motion-assisted Memory Desensitization and Reconsolidation (3MDR). A virtual-reality supported intervention, 3MDR exposes the patient, therapist and operator to potentially graphic sensory stimuli (i.e., narratives, imagery, smells, and music) during the intervention. 3MDR is actively being researched at multiple sites internationally within military, veteran, and public safety personnel populations. It is therefore crucial to ensure the safety and wellbeing of 3MDR therapists and operators who are exposed to potentially distressing sensory stimuli. The purpose of this exploratory qualitative study was to explore the impact and experiences of STS amongst therapists and operators in delivering 3MDR. For this study, impact will be defined as therapists or operators experiencing perceived STS as a result of delivering 3MDR.

Methods: This exploratory qualitative study recruited 3MDR

therapists and operators (N=18) from Canada, the Netherlands, the United Kingdom, and the United States who had previously delivered 3MDR therapy. Telephone or video-conferencing interviews were used to gather data that was subsequently transcribed and thematically-analyzed.

Results: Demographic data amongst the participants (N=18) demonstrated a wide variety of professions, levels of experience, military familiarity, and education amongst the international cohort of 3MDR therapists and operators from Canada (n=7), the Netherlands (n=6), United Kingdom (n=3) and United States (n=2). Four themes emerged among the therapists (n=13) and operators (n=5): (1) personal cost and benefits of 3MDR, (2) professional paradox of a 3MDR therapist, (3) perceived effect of 3MDR on patients, and (4) recommendations for future 3MDR use, and (5) technology acceptability. Although the participants were not completely unaffected by the experiences with 3MDR, STS was not noted to be a significant challenge for 3MDR therapists and operators. Levels of distress were not reported by the participants to be higher than those when utilizing other forms of evidence-based psychotherapies for trauma treatment amongst military and veteran populations.

Conclusions: Based on the qualitative data from the interviews amongst the 3MDR therapists and operators, STS was not noted to be a significant challenge for 3MDR therapists and operators. Future research may investigate optimal means of providing training and ongoing support for 3MDR therapists and operators.

4B02: Machine learning models predict Post-traumatic Stress Disorder Severity and Functional Impairment: A personalized medicine approach for uncovering complex associations among heterogeneous symptom profiles

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Introduction: Post-traumatic stress disorder (PTSD) is a highly prevalent and debilitating psychiatric illness that manifests in up to 18% of military members and Veterans, and 23% of public safety personnel (PSP). Approximately 15-30% of those affected by PTSD experience elevated symptoms of dissociation, which is associated with a more severe illness presentation and suboptimal response to standard treatments. Currently, there is an urgent need to use data-driven approaches to better understand complex associations across relevant clinical measures and heterogeneous symptom profiles in order to predict illness severity and improve treatment outcomes. This

study aimed to determine if machine learning models could predict PTSD symptom severity and functional impairment among a treatment-seeking sample of adults with PTSD.

Methods: Secondary data were provided by the Homewood Health Centre, which amassed a large clinical dataset (n=393) of treatment-seeking Canadian military members, Veterans, and PSP between 2010 and 2020 as part of standard clinical practice at admission to the Post-traumatic Stress Recovery Unit. Baseline measures of interest included biological sex, age, PTSD symptom severity, negative trauma-related cognitions about others, dissociation, emotion dysregulation, anxiety, depression, functional impairment, subjective cognitive impairment, and trauma-related guilt and shame. Using non-missing data (n=337), we trained non-linear machine learning models (extremely randomized trees) to identify predictors of clinical symptoms and assess model performance based on predictions in novel subsets of patients (nested cross-validation).

Expected Results: The machine learning model predicted 43% of the variance in PTSD symptom severity (R²_{avg}=.43, R²_{median}=.43, p<.001). Here, the most important predictors were symptoms of anxiety, dissociation, depression, negative trauma-related beliefs about others, and emotion dysregulation. Our model also predicted 32% of the variance in functional impairment scores (R²_{avg}=.32, R²_{median}=.33, p=.001). Similarly, anxiety, PTSD symptom severity, subjective cognitive impairment, dissociation, and depression were the most important predictors of functional impairment.

Conclusions: PTSD symptom severity and functional impairment were predicted with high accuracy. Dissociation emerged as an important predictor in both models, indicating that dissociative symptomatology may be a critical target/consideration for trauma-based interventions. Comorbid anxiety and depression were also associated with a more severe illness presentation. Moreover, our results highlight the importance of targeting maladaptive trauma appraisals, subjective cognitive impairments, and emotion dysregulation in order to decrease the severity of trauma-related illness. Overall, this research demonstrates that machine learning models are a powerful tool for uncovering complex associations between trauma-related symptoms, and for informing a personalized medicine approach within a highly heterogeneous psychiatric disorder.

4B03: Psychiatric Comorbidity Patterns in Military Members Assessed at Canadian Armed Forces Mental Health Clinics

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Introduction: Psychiatric comorbidity, defined as two or more co-occurring psychiatric diagnoses, is on the rise among

Canadian Armed Forces (CAF) members. The prevalence of comorbid mood and anxiety disorders among service members almost doubled between 2002 and 2013. Compared to individual diagnoses, comorbid psychiatric disorders may exacerbate symptoms and increase treatment costs. Patterns of comorbidity may also reflect underlying disorder etiology. There have been no published studies describing comorbidity patterns among CAF members seeking treatment.

Methods: This retrospective study used diagnoses documented during in-depth diagnostic assessments conducted by a psychiatrist or psychologist. We included CAF members with an assessment documented in the Canadian Forces Health Information System (CFHIS) electronic medical record between January 2017 and December 2020. We selected the most recent assessment for each service member. ICD-10-CA codes were categorized into 32 diagnoses, encompassing all mental and behavioural disorders. Service members without a psychiatric diagnosis were excluded.

We used latent class analysis (LCA) to identify and describe subgroups of service members with similar comorbidity patterns. LCA is a clustering technique that can segment the cohort into subgroups, or classes, with similar diagnoses. Service members with two or more diagnoses were included in models. We ran LCA models sequentially, increasing the number of classes to identify the best-fitting solution.

Results: The cohort had 8,298 service members. The most common diagnoses were depressive disorder (27.9%), post-traumatic stress disorder (PTSD, 26.3%), adjustment disorder (22.4%), and other stress-related disorders (11.9%). 3,361 service members (40.5%) had two or more diagnoses and were modelled. Among these members the median number of diagnoses was 2 (IQR: 2-3) and the maximum was 7. The 5-class model fit best. Diagnosis patterns of the five subgroups are described below.

- Depressive disorder and PTSD, with low probabilities of other disorders (21.6% of population)
- Adjustment disorder, with moderate probabilities of PTSD and depressive disorder (19.3%)
- Depressive disorder, with moderate probabilities of generalized anxiety disorder and other stress and trauma-related disorders (19.2%)
- Alcohol-related disorders, with moderate probabilities of other substance disorders, PTSD, and depressive disorder (13.1%)
- Mixed disorder group with moderate probabilities of generalized anxiety disorder, mood disorders, PTSD, other stress-related disorders, and hyperkinetic disorders (26.7%)

Conclusions: This study showed comorbidity patterns among

individuals who were assessed in CAF mental health clinics. The results will facilitate future research on the clinical course and natural history in those with complex case mix patterns of mental disorders.

4B05: The Neuroplastic Alpha Rebound Effect: Restored Alpha Brain Rhythms and Reduced Symptoms in Post-traumatic Stress Disorder Following a Double-Blind, Randomized Controlled Trial of EEG Neurofeedback

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Introduction: Despite the high prevalence rate of post-traumatic stress disorder (PTSD) worldwide and its debilitating psychopathology, up to 40% of patients with PTSD can fail to respond to frontline treatments such as psychotherapy or pharmacotherapy. It is therefore critical to develop novel, neuroscientifically-guided treatments that target more directly the neural mechanisms implicated in PTSD. In this study, we conducted a 20-session, double-blind, randomized controlled trial (RCT) of alpha desynchronizing electroencephalography neurofeedback (EEG-NFB) in patients with PTSD over 20-weeks. Our objective was to provide mechanistic evidence underlying clinical improvements by examining changes in aberrant PTSD brain rhythms (alpha power) as a function of neurofeedback treatment.

Methods: We randomly assigned participants with a primary diagnosis of PTSD (n=38) to either the experimental group (n=20) or sham-control group (n=18). A 19-channel EEG cap was used to record whole-scalp resting-state activity pre- and post-NFB treatment, for both the experimental and sham-control PTSD groups, using the Brainstorm toolbox for comparisons of alpha source power. We further compared baseline alpha source power pre-NFB between PTSD and age/sex-matched neurotypical healthy controls (n=32).

Expected Results: We observed significantly reduced alpha source power at baseline in the PTSD as compared to the neurotypical healthy control group, primarily within areas of the anterior default mode network (medial frontal gyrus). Of importance, we found that only PTSD patients in the experimental group demonstrated alpha resynchronization within areas that displayed reduced alpha source power at baseline. Further, we observed significantly decreased PTSD severity scores in the experimental NFB group only, when comparing post-NFB ($d_z = 0.77$) and 3-month follow-up scores ($d_z = 0.75$) to pre-NFB, with a remission rate of 60.0%.

Conclusions: Our results suggest that alpha-based EEG-NFB has the capacity to normalize aberrant alpha patterns that have repeatedly been observed in PTSD. Importantly, this study replicates previous observations reporting alpha rhythm resynchronization following NFB treatment. The current findings also suggest that the alpha rebound effect, or homeostatic alpha resynchronization following NFB training, may be a critical neuroplastic mechanism underlying PTSD symptom reductions.

4C02: Drinks:Ration: A protocol for a randomised controlled trial of the United Kingdom Armed Forces military personnel

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Introduction: Alcohol consumption is intrinsically linked to military populations with evidence that Service personnel drink significantly more than civilian populations and that this excess continues beyond the end of Service. There is, however, no evidence for the effectiveness of alcohol behavioural interventions in military populations. Drinks:Ration is a smartphone application (app) which aims to change alcohol use behaviours in Service personnel. This study protocol describes a randomised controlled trial (RCT) being undertaken in the UK military population. It is hypothesised that personnel using the Drinks:Ration app will reduce their alcohol consumption, at day 84, compared to a control arm of usual care.

Methods: This study is a two-arm randomised controlled trial comparing the Drinks:Ration app with usual care. Participants will be serving in the UK Armed Forces and recruited through periodic dental inspections, targeted communications, and military social media. Eligible participants will score 5 or more on the Alcohol Use Disorders Identification Test-C (AUDIT-C), showing an increased risk of alcohol related harm. Consenting participants will be randomised in 2 participant blocks in a 1:1 ratio to ensure equal gender distribution. Data will be collected on a range of drinking behaviours and wellbeing using validated surveys disseminated through the app or the REDCap research programme. The primary outcome measure is a change in alcohol units consumed per week between baseline and day 84 as measured by the timeline follow back method. Secondary outcomes are change in AUDIT score, change in quality of life assessment, change in drinking motivations and app usability.

Expected Results: The study will be reported in line with the CONSORT criteria for RCTs and the Template for Intervention Description and Replication guide. A similar trial of the Drinks:Ration app using a help-seeking veteran population recently demonstrated that between baseline and day 84,

weekly alcohol consumption had a reduction of -10.5 [95% CI: -19.5 to -1.5] units in the control arm and -28.2 [95% CI: -36.9 to -19.5] units in the intervention arm (p-value=0.003; Cohen's d=0.35). It is expected that the results of the trial in an in-service population will be similar.

Conclusions: This trial aims to, for the first time, demonstrate the effectiveness of behavioural interventions in reducing alcohol consumption. This could lead to the app being integrated into Defence policies for managing and supporting military personnel seeking help for alcohol use.

4C04: Risk Factors for In-service Offending among United Kingdom Military Personnel - A data linkage study

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Introduction: Research into offending behaviour within military populations has largely focused on post-deployment and post-service offending, particularly violent offending. There has been limited research into non-violent offending behaviour and offending that occurs during service. The purpose of this study was to explore the risk and protective factors for in-service offending (violent and non-violent) perpetrated by UK military personnel.

Methods: This was a data linkage study between a large cohort study of randomly selected Regular UK Armed Forces personnel (n=9,652) and the Ministry of Defence's REDCAP database which records offences perpetrated by military personnel during service.

Results: The results of this study demonstrate that younger age, male gender, lower educational attainment, having a history of pre-enlistment antisocial behaviour, being in the Army, and holding a lower rank increased the risk of in-service violent and non-violent offending behaviour. Compared to non-deployed personnel, being deployed increased the risk of in-service offending, both violent and non-violent. Trauma exposure during deployment and post-deployment mental health problems including symptoms of PTSD, alcohol misuse and common mental disorders were not associated with increased risk of in-service offending. Only the presence of self-reported anger was associated with an increased risk of in-service violent offending.

Conclusions: This study has shown that background risk and protective factors and being deployed mirror those found in lifetime offending research. Anger management problems were strongly associated with in-service violent offending, and so interventions targeting emotion regulation strategies should be a key feature of in-service violent offending strategies.

4C05: Lifetime Offending Behaviour among United Kingdom Military Personnel - A data linkage study

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Introduction: Research into offending behaviour within military populations has largely focused on post-deployment or post-service offending. There has been limited research exploring how military personnels' experiences during service can impact later offending. This study aims to explore offending behaviour at each stage of the lifecourse (pre-service, in-service and post-service). The study also aims to identify offender subgroups based on the patterns in offending behaviour.

Methods: This study uses a large randomly selected sample of the UK Armed Forces (N=11,418). Data on sociodemographics and experiences during service (including pre-and post-deployment), along with post-deployment mental health factors were collected by self-report questionnaire (collected at three time points, 2003-2005, 2007-2009 and 2013-2016). This data is linked using Ministry of Justice's official offence record database of offending behaviour, the Police National Computer (PNC).

Expected Results: While the study has not been completed, researchers expect that the risk and protective factors associated with offending behaviour will not differ for pre-service, in-service and post-service offending. Background factors, including age and level of education will continue to be strongly associated with offending. Researchers hypothesise that there will not be a difference in the profile characteristics of the different offender subgroups.

Conclusions: This study will provide much needed insight into the prevalence and risk and protective factors for offending behaviour throughout the lifetime of military personnel as well as how offending behaviour changes over time. The results of this study will help to identify risk and protective factors for offending behaviour to inform the development of support services to reduce offending and target key risk factors.

6B02: The Impact of the COVID-19 Pandemic on Mental Health and Coping Strategies in a Canadian Armed Forces Sample

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Introduction: Mental health is an important component of force effectiveness for the Canadian Armed Forces (CAF). Researchers at Defence Research and Development Canada, in support of Canadian Forces Health Services, examined how CAF personnel's self-reported coping and mental health has been impacted by the COVID-19 pandemic.

Methods: Our final sample consisted of 525 CAF members across elements and ranks using stratified random sampling. Participants completed the Brief COPE which measured how they tend to cope with stressors in their life, both before and during the COVID-19 pandemic, the short Self-Compassion Scale, and questions, designed by the researchers, to assess how the pandemic has impacted them. The data were collected as part of a larger investigation of coping and mental health in the CAF using the on-line survey platform Qualtrics.

Results: In terms of personal life, 45% of our sample reported that their mental health was at least somewhat impacted by the pandemic, and 54% reported that their physical health was at least somewhat affected. In addition, 50% reported that their family life was at least somewhat impacted. Female participants reported greater impact of the pandemic on mental health, physical health, and family life in comparison to male participants (all p 's < .04).

In terms of coping strategies, CAF respondents self-reported engaging in less avoidant coping strategies (i.e., self-distraction, denial, venting, and self-blame) during the pandemic versus prior to the pandemic, as well as less approach coping strategies (i.e., active coping, use of emotional and instrumental support, reframing, and planning). In addition, they engaged in more acceptance during the pandemic versus before.

The tendency to engage in more self-compassion was associated with reporting less impact of the pandemic on mental health ($r = -.37, p < .001$), and lower engagement in avoidant coping strategies ($r = -.55, p < .001$).

Conclusions: The pandemic negatively impacted approximately half of the CAF respondents' personal lives, and female CAF members may need additional support. During the pandemic, CAF members reported using more acceptance as a coping strategy, which may reflect an adaptive response to the relative lack of control they had over the pandemic. Lastly, self-compassion may be a promising avenue for future work in relation to mental health and coping. Future studies should include larger samples to improve generalizability and quasi or experimental designs, especially true pre-post designs, to enhance causal inferences.

Poster Presentations

P115: Evaluation of The Road to Mental Readiness for Canadian Forces Health Services Personnel

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Program/Intervention Description: A recent study on barriers to accessing both physical and mental health care among Canadian Forces Health Services (CFHS) personnel suggest a pattern of under-accessing care. The Road to Mental Readiness (R2MR) is a psycho-educational training program

that, broadly, aims to increase mental health literacy among all CAF personnel. In 2018, a tailored R2MR program for health services was created for CFHS members, with the primary goals of 1) increasing knowledge of available resources and mental health skills 2) encouraging access to care when required 3) decreasing stigma surrounding mental health services use. The goal of the current study is to assess the ability of the targeted R2MR program to achieve its intended goals.

Evaluation Methods: Using a mixed-methods approach, all participants who completed the health services R2MR training were invited to complete an online survey (N = 104). Then a sub-sample of respondents, selected to ensure diversity and representation in participant experiences and backgrounds were invited to participate in a semi-structured interview (N = 12). The survey included questions regarding knowledge of existing resources in the CAF, a skills test of the main skills taught in the course, and the Inventory of Attitudes toward Seeking Mental Health Services (IASMHS) scale. The interview included questions about applicability of skills learned, ease in seeking care, and comfort level providing support to their colleagues.

Results: Preliminary analysis of quantitative data suggest that over 85% of participants are knowledgeable about available mental health services, and over 60% of participants passed the skills test. IASMHS suggested that participants scored low on help seeking propensity, and high on ability to recognize a psychological issue.

Preliminary qualitative results suggests the skills learned in the program are considered important and essential to many participants, though the retention of the skills appears to decline over time. Results indicate ongoing systemic barriers to applying the course learning, and to seeking care when needed. The most common reasons expressed for not accessing care were: job demands, not wanting to burden overtasked CFHS staff, inability to self-advocate, lack of trust in their chain of command and the general health care system, and discomfort with seeking care from their own colleagues.

Conclusions: The program has been successful in meeting some of its intended goals, though there are areas where improvements could be made to strengthen the efficacy of the program. Modifications to the curriculum would be most effective in conjunction with systemic changes within the CAF.

P116: Improving Canadian Armed Forces Mental Health and Resilience Training: Understanding trainee preferences for the Road to Mental Readiness Program

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Introduction: The Canadian Armed Forces (CAF) employs the Road to Mental Readiness (R2MR) program as its primary source of mental health and stress resilience training. However, empirical findings suggest limited psychological and resilience benefits from the current program, highlighting opportunities for refinement. To identify targets for improvement, it is necessary to understand what CAF personnel prioritize in a training program. This information can be derived using Conjoint Analysis (CA), a method used to understand preferences for multifaceted products. When applied to training programs, CA can quantify the relative importance of training program features based on selections that trainees (i.e., CAF personnel) make between hypothetical program options. Given that health preferences vary by individual differences, it is plausible that training preferences will also need to account for individual characteristics to reflect the needs of CAF members. The purpose of this research is to use CA to extract, quantify, and synthesize CAF members' prioritized training features generally, and according to CAF-member characteristics.

Methods: Approximately 400 CAF personnel will be recruited to complete an online survey comprising a CA module and questions on health beliefs (health locus of control), mental health and R2MR experiences, and demographics. In the CA module, participants will make a series of choices between hypothetical training options where each training option represents a unique combination of training attributes (e.g., training instructor) defined by one level of each attribute (e.g., instructor is a CAF peer vs. instructor is a mental health clinician).

Expected Results: Statistical analyses will quantify the sample-level and subgroup-specific relative preferences for training program attributes and attribute levels. Hierarchical Bayes (HB) estimation will be used to derive individual-level training preferences, which can be examined in relation to participant variation across other data collected (e.g., degree of internal vs. external health locus of control) to understand whether preference patterns reliably vary according to participant characteristics. Together, analyses will reveal a set of prioritized training features, sensitive to individual differences.

Conclusions: The purpose of this research is to quantitatively identify a hierarchy of prioritized training features derived from CAF members' feedback. Results of this survey will be used to guide R2MR improvements in alignment with the needs of Canadian military members, both generally and with respect to individual variation. Outcomes of this research will establish clear priorities for the design, implementation, and policies regarding the content and delivery of R2MR program within the CAF.

P117: Coping Effectiveness in a Canadian Armed Forces Sample

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Introduction: The mental health and well-being of Canadian Armed Forces (CAF) personnel is tied to force effectiveness. Although research suggests the presence of some positive mental health outcomes associated with resilience training, Defence Research and Development Canada (DRDC) researchers are examining if outcomes can be improved via the development of a personalized coping tool to augment the mental health training. As an initial step, we tested a statistical model that examines how personality traits, individual differences, and coping styles impact mental health outcomes in a CAF sample.

Methods: We tested a moderated-mediation model to explain the relationships between coping styles (approach and avoidant), personality (six-factor model), individual differences (self-concealment, loneliness, psychache [i.e., psychological pain], public stigma, self-stigma, self-compassion, and organizational trust), and mental health outcomes (depression, anxiety, suicide ideation, alcohol use, and post-traumatic stress disorder (PTSD)). Stratified random sampling was employed to recruit a representative sample of rank and element across the CAF. Participants were randomly selected to be invited to participate. Our final sample consisted of 525 Regular Force and Primary Reserve Class B CAF members.

Results: We tested a moderated-mediation model to explain the relationships between coping styles (approach and avoidant), personality (six-factor model), individual differences (self-concealment, loneliness, psychache [i.e., psychological pain], public stigma, self-stigma, self-compassion, and organizational trust), and mental health outcomes (depression, anxiety, suicide ideation, alcohol use, and PTSD). Stratified random sampling was employed to recruit a representative sample of rank and element across the CAF. Participants were randomly selected to be invited to participate. Our final sample consisted of 525 Regular Force and Primary Reserve Class B CAF members.

Conclusions: Although our results suggest that the individual differences we measured are related to both avoidant coping and mental health outcomes, they are not the underlying mechanism explaining the relationship between coping style and mental health. The exception is psychological pain, which did partially explain the relationship between avoidant coping and mental health. Here, greater avoidant coping leading to poorer mental health outcomes is partially due to higher psychological pain. Future research is needed to better understand how a personalized coping tool can help reduce both avoidant coping strategies and psychological pain.

P123: Validation of the Spiritual Health and Well-being Continuum

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Introduction: The Canadian Armed Forces (CAF) is shifting towards a more holistic view of health and wellness, moving beyond mental and physical health to include spiritual health among other factors. However, assessing spiritual health has been a challenge with existing measures having significant limitations that prevent them from being used effectively in a military context. The aim of this study was to assess the reliability and validity of the Spiritual Health and Well-being Continuum (SHWBC), a tool created by the Royal Canadian Chaplain Service which assesses nine facets of spiritual health and well-being: (1) meaning and purpose; (2) morals, values, and beliefs; (3) hope; (4) forgiveness; (5) respect for others' beliefs; (6) sense of belonging; (7) worldview; and (8) resilience.

Methods: One hundred and seventy-seven CAF personnel completed the SHWBC, as well as nine validated measures assessing each facet included in the SHWBC, a question assessing mental health, and perceived spirituality. For each facet of the SHWBC, respondents were asked to select one of four anchors that represent different levels of functioning: thriving, surviving, struggling, or in crisis. In order to assess whether the facets have a single underlying construct (i.e., spiritual health and well-being), an Exploratory Factor Analysis was conducted using Principal Axis Factor estimation. Parallel analysis was used to determine the number of factors to retain. In order to assess construct-related validity, correlations were calculated between each facet and its associated validated scale. Correlations over .50 were considered a sufficiently high relation between the variables. For each association to assess whether one's state differs across anchors, one-way analysis of variances were conducted with Tukey's pairwise comparison test post-hoc.

Results: The parallel analysis suggested a single factor, and aside from respect for others' beliefs, all remaining facets loaded onto a single factor with satisfactory loadings. The SHWBC had adequate reliability ($\alpha = .79$). Eight of the facets were strongly related to their associated measure, and showed good discrimination between anchors. Worldview, however, correlated weakly with its associated measure and did not yield differences between anchors. However, worldview did correlate with a modified spiritual health and well-being score, suggesting the issue may be with the selected validated measure and not the facet itself. SHWBC scores were strongly correlated with mental health, supporting a holistic approach to health.

Conclusions: Though future work is needed, the results suggest a positive step in creating a valid, easy to use, CAF specific measure of spiritual health and well-being.

P124: The Importance of Human Dimensions of Operations Factors in Predicting the Morale and Psychological Distress of Canadian Armed Forces Members Deployed to Long-term Care Facilities During COVID-19

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Introduction: Identifying and understanding the main human dimensions of operations (HDO) that can affect soldier well-being, morale, cohesion and performance are essential to the success of any mission, especially in light of the rapidly changing nature of the global operational environment. Although many variables are associated with lower psychological well-being, not much is known about the relative importance of these dimensions when they are considered together. Thus, this study aims to examine the relative importance of multiple HDO factors in predicting morale and psychological distress among Canadian Armed Forces (CAF) personnel deployed under Operation LASER (Op LASER) in response to provincial Requests for Assistance (RFAs) to support civilian staff battling the COVID-19 pandemic in long-term care facilities (LTCF) in Ontario and Centres d'hébergement et de soins de longue durée (CHSLD) in Québec.

Methods: In a cross-sectional sample of 668 CAF members deployed in LTCF and CHSLD in spring 2020, dominance analyses were used to estimate the proportional contribution of each HDO variable to morale and psychological distress symptoms. The HDO factors include self-reported meaningfulness of deployment, competence, relatedness, trust in teams, and trust in leadership.

Results: Results show that 47% of the variance in morale was accounted for by five of the HDO factors. Specifically, relative importance weights showed that meaningfulness accounted for 28%, competence accounted for 9%, and relatedness for 6%. Although still significant, trust in leadership and trust in teams accounted for smaller proportions of variance (2% each). Ten percent of the variance in psychological distress symptoms was accounted for by relatedness (6%), trust in leadership (3%), and competence (1%). Meaningfulness and trust in teams did not account for a significant amount of the variance in psychological distress.

Conclusions: Results suggest that increasing meaningfulness of the work during deployment, followed by trust in teams, could be powerful ways to increase morale, but that such interventions would be unlikely to have an effect on psychological distress symptoms. The results also suggest that increasing relatedness, competence, and trust in leadership might decrease symptoms of psychological distress and increase morale. In sum, these findings highlight that HDO factors are differentially associated with

well-being and morale, and have important implications for military effectiveness, well-being and potential interventions during deployment.

P128: Does Doing your Homework Really Matter? The impact of homework engagement on posttraumatic stress disorder and relationship satisfaction in Couple HOPES, an online, self-directed couple intervention

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Introduction: Couple HOPES (Helping Overcome Posttraumatic Stress Disorder [PTSD] and Enhance Satisfaction; CH), is an online, self-directed intervention for couples wherein one member has PTSD. As an adaptation of Cognitive Behavioral Conjoint Therapy for PTSD (Monson & Fredman, 2012), CH aims to simultaneously improve PTSD and relationship satisfaction. It contains seven interactive modules that incorporate psychoeducational videos and homework assignments, as well as bi-weekly coaching calls. Results from an initial case series and uncontrolled trial indicate that CH improves PTSD and enhances relationship satisfaction in both partners of a couple wherein one individual has probable PTSD. Engaging with homework is central to the CH intervention and is theorized to be critical to its efficacy. Moreover, there is considerable variability in homework engagement because several assignments allow couples to enter multiple entries, daily. Indeed, psychoeducational videos and coaching calls emphasize the importance of homework engagement to optimizing outcomes. Given that CH assignments are dyadically designed, it is likely that each individual's engagement with homework will influence their own, and their partner's, outcomes. However, the influence of individuals' engagement with homework on their own, and their partner's, outcomes remains unclear. Therefore, the current study aims to examine whether the extent to which couple's homework engagement (i.e., total number of completed assignment entries) predicts improvements in PTSD and each partner's relationship satisfaction.

Methods: This study uses a combined sample of 27 couples who completed a case series or uncontrolled trial of CH (Fitzpatrick et al., 2021; Monson et al., 2022). In both samples, one individual of the couple was a military member, veteran, or first responder with probable PTSD. Individuals with probable PTSD and their partners completed online surveys measuring PTSD symptoms (PTSD Checklist for DSM-5; PCL-5; self- and

informant-versions) and relationship satisfaction (Couples Satisfaction Index; CSI-4) prior to each module, and at pre-, mid-, and post-intervention timepoints. Using intent-to-treat principles, multilevel growth models will be conducted to examine whether each partner's frequency of homework entries predicts subsequent changes in self- and informant-ratings of PTSD and relationship satisfaction across multiple timepoints.

Expected Results: It is expected that increased homework engagement will lead to greater reductions in PTSD, and greater improvements in both partner's relationship satisfaction.

Conclusions: Study findings will contribute to a deeper understanding of how couples engage with CH homework assignments, and whether future couples who undergo CH may maximize PTSD and relationship satisfaction benefits from the program based on their level of engagement with homework.

P133: Measuring Psychological Safety: A meta-analysis and systematic review

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Introduction: In a psychologically safe environment, team members feel safe to share ideas, acknowledge errors, experiment with new ideas, and exhibit mutual respect. Despite the recognized importance of psychological safety, there is no consensus in terms of how psychological safety should be measured, the components that make up psychological safety, and how to use evaluations to inform policy development to enhance psychological safety. In our presentation, we will overview findings from a meta-analysis and systematic review of the literature reflecting the availability and quality of measures used to evaluate psychological safety in various occupational populations.

Methods: The literature search was conducted on October 26, 2021, using five databases: PsycINFO (OVID), MEDLINE (OVID), PsycTests-ProQuest, SCOPUS, and ProQuest Dissertation & Theses. A total of 205 studies with 224 independent samples were included in the review. Psychological safety was assessed via self-report measures.

Results: The quality of measures was examined through evaluations of internal consistency and sampling distributions. Across 224 samples of data, the average internal consistency via Cronbach's alpha was .81. The pooled point estimate and standard errors (SE) across studies were 4.72, SE = 0.07, 95% CI

(4.58, 4.85), $Z = 68.07$, $p < .001$. These effects were considerably heterogeneous across samples ($I^2 = 99.92$), $Q(221) = 259632.32$, $p < .001$.

Conclusions: Together, findings suggest that the quality of measures evaluating psychological safety may be acceptable. However, there is room for improvement in terms of how the factor structures of psychological safety measures are examined, the degree to which psychological safety may be associated with other constructs, and how to capture similarities and differences in psychological safety across population sectors. Future directions in research and applications of psychological safety will be discussed, particularly as they relate to military and public health and safety personnel.

P134: A Bit of Mental Preparation: A scoping review of mental performance programming in the 5 Eyes Forces

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Introduction: Traditional sports and military training are often compared for their likeness in developing mindsets and physical conditioning of athletes and soldiers alike (Townsend, 2014). As mental performance strategies have been used effectively in a variety of elite sport settings, the purpose of this scoping review was to explore the applications of mental skills specifically within armed forces populations. Further, this review sought to uncover what types of programs have been established; the skills presented within this population; and who the programs are designed to benefit. Beyond programs specifically, the review was designed to uncover additional forms of psychological skills training received.

Methods: A scoping review method was employed to provide an overview of the type of programs or training received, targeted populations, and foci of mental performance applications in English speaking armed forces. Particular attention went toward the Canadian landscape as the first step of program development in subsequent research. Following Arskey and O'Malley's (2005) six-step scoping review framework, the steps followed included: a) identification of a research question, b) identification of relevant studies, c) study selection, d) charting data, and e) collecting, summarizing, and reporting results. The sixth step, an optional consultation exercise, was not included due to feasibility and scope of this review.

Results: Of 52 studies reviewed, only three represented a Canadian Armed Forces perspective. Most programs were oriented toward supporting active duty members, and 15 studies did not present a specific program. There was significant overlap amongst the 52 studies with certain programs represented in several papers, and others mentioned only one time. Fourteen different mental skills were referred to within the

studies. Emotion regulation/anxiety management, resilience, goal setting, and mental rehearsal/imagery were all presented in more than twenty studies. Evaluating the studies, the quality of each study was determined based on the quality of program information, participant outcomes, and program effectiveness.

Conclusions: Findings of this review identify a need for more programming tailored toward the needs of families of serving armed forces members, seeking to provide them with adequate skills implemented directly within the family system as opposed to a delivery of skills via the active member. This review also identifies the need for more psychological skills research within the Canadian Armed Forces landscape. It is unclear if there is simply a lack of programming offered in the Canadian context, or whether the problem lies with a lack of research to understand the efforts that do exist.

PRIMARILY PHYSICAL HEALTH & WELL-BEING

Podium Presentations

2B01: How a Modified Physical Training Program was Implemented on an Infantry Training Course to Reduce Musculoskeletal Injuries

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Program/Intervention Description: The 4th Canadian Division Training Centre (4CDTC) is the central host for Developmental Period 1 Infantry courses (DP1). Between 2015–2018 4CDTC reported an increase in DP1 attrition from 26% to 32% and overuse musculoskeletal injuries (MSKI) from 64 to 71% due primarily to rucksack marching and physical training (PT). The consequential burdens of administration, healthcare and limited occupational readiness warranted the implementation of effective overuse MSKI mitigation strategies.

Research has shown that leadership supported modified PT effectively reduces MSKI during military training, however it has not been implemented in DP1. Lack of stakeholder engagement to adapt research into context-appropriate interventions is a common barrier to implementation. Therefore, the purpose of this intervention was to engage 4CDTC Stakeholders (Defence Team staff: fitness, leadership, medical, research & training) to collaboratively adapt existing research on modified PT to minimize overuse MSKI and facilitate its' implementation in DP1 without compromising operations.

Guided by a knowledge transfer framework, 4CDTC

Stakeholders collaboratively designed a context-appropriate modified PT program based on DP1 occupational demands, overuse MSKI profiles and best practices in reducing MSKI during rucksack marching and PT; discussed barriers/facilitators to its' implementation in DP1; and reached consensus on operationalized quantitative and qualitative implementation outcomes. Fitness stakeholders mentored training stakeholders to deliver modified PT and monitor delivery fidelity. Research stakeholders estimated resource requirements (i.e., Fiscal, human, time) and mentored fitness and medical stakeholders in implementation outcome collection.

Evaluation Methods: The modified PT program was implemented in 3 out of 6 DP1 courses at 4CDTC during 2019/2020. Implementation outcome targets included participant recruitment $\geq 70\%$, outcome measurement and intervention fidelity rates $\geq 80\%$, reduced overuse MSKI $\geq 25\%$, fewer attritions and consensus from 4CDTC Stakeholders that implementation processes did not compromise DP1 operations.

Results: Most implementation outcome targets were met including: 84.2% recruitment, 100% outcome measurement, 87.5% intervention fidelity, reduced overuse MSKI by 68% and 11 fewer attritions. Intervention duration was limited to 8 weeks due to decreased DP1 candidate availability and intervention fidelity was challenged by holidays, unscheduled priorities and facility access. 4CDTC Stakeholders agreed that implementation demands were manageable without compromising DP1 operations.

Conclusions: A group of Defence Team stakeholders guided by a knowledge transfer framework successfully facilitated implementation of modified PT into DP1, leading to reduced overuse MSKI and attrition rates. If sustainable, these results have implications for DP1 training, if reproducible, these results may be generalizable to other combat arms occupations.

2B02: A Suite of Programs to Aid in Musculoskeletal Injury Management

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Brief Description: Allied health care professionals act as force enablers or multipliers by providing services that decrease the overall burden on primary health care providers (PHCP). This is more necessary now than ever before, with military members waiting at least two weeks to see their PHCP for routine or non-urgent concerns and 120 days to have an initial appointment with an orthopaedic surgeon. These excessive wait times have exacerbated existing issues and created secondary problems such as mental health concerns while also prolonging a return to work. To solve some of these issues three evidence-informed programs have been created that propose using allied health care professionals to work collaboratively with primary care.

Patient Population: Active duty Canadian Armed Forces members.

Results: The first program, the Rehabilitation Medical Access Program, implemented and studied in Halifax, Nova Scotia, increased the appropriateness of referrals for orthopaedic surgery and decreased the wait for an appointment to 26 days. The second program, the Diagnostic Medical Access Program, proposes to give the authority to physiotherapists to order diagnostic imaging, potentially reducing the patient's wait for results by four weeks. The final program, the Return to Duty Access Program, leverages the existing return to duty administrative process coupled with in-house occupational therapists to aid PHCP in crafting objective, meaningful medical employment limitations to hasten the return to duty of military members.

Conclusions: These programs could collectively change the management of musculoskeletal injuries in the Canadian Armed Forces (CAF) through decreasing wait times for PHCP and specialists while enhancing the patient experience and returning them to duty in an efficient and sustainable manner. Additionally, these programs could increase the evidence-informed care that the CAF provides its members while also increasing collaboration between different sections, thereby breaking the silos of care and maximizing the healthcare system's potential. The results of these programs would not only help the CFHS, but it could enable the entire CAF by increasing the employability and deployability of its injured members.

2B03: Feasibility and Fidelity of the Royal Canadian Air Force Aircrew Conditioning Program

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Program/Intervention Description: More than 90% of Royal Canadian Air Force (RCAF) aircrew report significant flight-related neck pain (Smith, 2021). One of the most promising solutions is targeted strength and conditioning programs (Ang, 2009; Salmon, 2011). As recommended by the NATO Human Factors Medicine Research and Training Group 252 on Aircrew Neck Strain (Farrell, 2020) and demonstrated by the Royal Air Force and the Royal Australian Air Force, the Aircrew Conditioning Program (ACP) has proven to effectively reduce/prevent neck injury, reduce time away from flying and improve performance (Slungaard, 2018; Slungaard, 2019; Wallace, 2019).

With direction from Canadian Forces Environmental Medicine Establishment (CFEME), in August 2021, the RCAF adopted an adapted ACP at 408 Squadron and 2 Canadian Forces Flying Training School (CFFTS). Implementation required a dedicated Physical Exercise Specialist (PES) and a commitment from each RCAF Unit leadership to mandate that all aircrew complete a minimum of two RCAF ACP training sessions per week.

Evaluation Methods: Evaluation includes objective (physiotherapy, fitness assessments) and subjective (surveys) metrics to determine (1) effectiveness, and (2) feasibility to implement a similar program across the RCAF. Physical and subjective outcomes are collected at baseline and 3,6,12 month intervals.

Effectiveness is determined by musculoskeletal survey results and reporting. Program feasibility is assessed from three different perspectives: (1) resources and CAF personnel availability, (2) compliance, and (3) evolutions to the program.

Results: From baseline to 3-months, deep neck flexor endurance significantly improved by 19.9s (408 Squadron) and 22.9s (2 CFFTS). These results demonstrate the effectiveness of the RCAF ACP after only 12 weeks of training. However, feasibility remains an issue.

At 408 Squadron, compliance ranged from 55% (week 1) to <5% (week 9). At 2 CFFTS, compliance was significantly higher, ranging from 93% (week 1) to 47% (week 12).

Low participation/compliance is preventing program progression at 408 Squadron, where Operation LENTUS and multiple exercises all negatively impacted participation.

The more structured environment of a training establishment (2 CFFTS) facilitated better attendance/compliance. However, challenges still exist, including scheduling during blocks of night flying and weather-related changes to the flying schedule.

Conclusions: Preliminary testing indicates the effectiveness of the RCAF ACP is reliant on compliance and any expansion of the program must include additional efforts to identify/remove barriers, maximizing participation.

While awaiting implementation of RCAF ACP at other locations, aircrew are encouraged to adhere to any conditioning program that focuses on total body fitness, core fitness, and very low weight supervised neck-specific exercises.

2B04: Does a History of Childbirth Impact Musculoskeletal Injury in Female Military Members?

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Introduction: Musculoskeletal injuries (MSKi) impact males and females differently in the Canadian Armed Forces (CAF). This study aims to identify if a history of childbirth is associated with MSKi occurrence within female members of the CAF.

Methods: From September 2020 to February 2021, data were collected via an online questionnaire that assessed MSKi,

reproductive health, and barriers to recruitment and retention in the CAF. Actively serving, female members were included in this analysis stratified by having biological children (n = 352) or not having biological children (n = 257). Descriptive analysis and binary logistic regressions were used to identify prevalence and adjusted odds ratios (aOR) of repetitive strain injuries (RSI), acute injuries, and body regions affected. Covariates included in aOR: age, body mass index, and rank. A p-value

Results: Female members with a history of childbirth were more likely to report an RSI (80.9% vs. 69.9%, aOR:1.57, CI:1.03;2.40), and when stratified by body region, were more likely to have an RSI of the wrist (30.0% vs. 20.5%, aOR:1.62, CI:1.09;2.40), foot (39.3% vs. 24.1%, aOR:1.79, CI:1.24;2.59), and lower back (40.5% vs. 30.4%, aOR:1.36 CI:0.95;1.94), when compared to nulliparous female CAF members .

No differences were observed in reporting of acute injuries overall or stratified by body region.

Conclusions: Parous and nulliparous female CAF members report different rates of MSKi. Females who have a history of childbirth were more likely to report RSI at the wrist, foot, and lower back when compared to the nulliparous group. No significant differences between groups were identified in the rate of acute injuries. Understanding body regions that are vulnerable to MSKi is imperative for prevention or reducing injury risk. The significant differences in body regions impacted by MSKi suggest specific support may be needed for females who's body has experienced childbirth. Further research into physical training and injury prevention strategies to offset the impact of childbirth on the female CAF member is recommended.

2E01: Effect of Hypoxia on the Cell Surface Expression of ACE2, the Receptor for SARS-Cov-2

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Introduction: The outbreak of COVID-19 has become a serious threat to global health. As of May 2022, over 400 million cases and more than 6 million deaths have been reported worldwide. COVID-19 is caused by the novel coronavirus SARS-Cov-2 by binding to its cell surface receptor, angiotensin converting enzyme 2 (ACE2). ACE2 is widely expressed across the body and subject to regulation by a variety of factors, including hypoxia. Hypoxia is commonly observed in COVID-19 patients. In this report, we hypothesize that hypoxia changes the cell surface expression of ACE2, thus changing the availability of this receptor to further virus binding.

Methods: Human embryonic kidney (HEK293) cells

overexpressing recombinant human ACE2 were exposed to hypoxia in a chamber containing 0.5% oxygen and 99.5% nitrogen for 4 to 24 hrs. Cell surface ACE2 were isolated using biotinylation and analyzed using western blots, Elisa assays and confocal microscopy.

Results: Results showed that there were no changes in ACE2 protein levels up to 24 hours of hypoxia. However, at 4 hours after hypoxia, ACE2 activity was decreased significantly compared to control. Furthermore, starting from 6 hours after hypoxia, cell surface ACE2 expression was increased dramatically, with nearly three fold enhancement at 24 hours after hypoxia. Re-oxygenation at 4 hours after hypoxia reversed the increased in cell surface ACE2 expression.

Conclusions: In conclusion, the current study showed that cell surface expression of ACE2 is dramatically increased as early as 6 hours after hypoxia. This will increase the availability of the receptor to bind and allow entry of more viruses into host cells, exacerbating infection. Furthermore, the decrease in ACE2 activity will reduce the protection of host cell protections afforded by ACE2. Therefore, early treatment with oxygen is recommended for patients who have low oxygen saturation.

4C03: Cigarette Smoking among Canadian Armed Forces Members

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Introduction: Cigarette smoking has well-established short- and long-term health consequences. Beyond these health implications, tobacco use can also have a negative impact on one's military career, through increased absenteeism, injuries, and reduced readiness (Haddock et al., 2007; Knapik et al., 2001; Robbins et al., 2002). In order to ensure that the Canadian Armed Forces (CAF) consists of combat-ready and deployable members, it is important to understand any underlying deleterious behavioural health trends among members. The current study aims to describe the rates of tobacco use and the demographic makeup of cigarette smokers in the CAF.

Methods: Data came from the CAF Health Survey, which was completed electronically in late 2019 by 13,065 Regular Force members (40% response rate). The sample was stratified by base, age group, and sex and mainly made up of male (86%), junior Non-Commissioned Members (Jr NCMs: 43%), 30 years and older (76%). Included in the survey were a number of items asking about lifetime and current cigarette smoking behaviours, as well as socio-demographic characteristics.

Results: Overall, 41% of CAF Regular Force members reported having smoked at some point in their lifetime, with 17% being current smokers (10% daily smokers and 7% occasional

smokers). Further examination of both current and former smokers revealed that males were more likely than females to report having ever smoked, and Jr NCMs were less likely than senior (Sr) NCMs to have smoked, but more likely to have ever smoked than Jr and Sr Officers. Those in the youngest age group (≤ 29) were less likely to report having ever smoked than all older age groups. For current daily cigarette smokers, there were no differences across sex or age. However, Jr NCMs were more likely to be current daily cigarette smokers than both Officer groups. Finally, for both current and former smokers, over one-third (35%) reported having started smoking cigarettes after joining the CAF (33% during basic training, 29% during occupational training, 16% during deployment, and 22% at other times).

Conclusions: These findings lend support to targeted intervention programs by the CAF's health promotion program and health services to address the current smoking rate and the significant proportion of CAF members who started smoking after joining the CAF. An important limitation is the recent increase in nicotine vaping, which might not be captured in questions on tobacco smoking, and which nonetheless has important health implications. Comparisons with civilian cigarette smoking rates will also be discussed.

5A01: Assessment of Training Load, Sleep, Injuries and Operational Physical Performance during Basic Military Qualification

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Introduction: Optimizing training load and sleep is essential to maximize physical performance and prevent musculoskeletal injuries (MSKI) during basic military qualification (BMQ). The purpose of this study was to evaluate the training load, sleep duration, and occurrence of MSKIs during BMQ. We hypothesized that the variation in the training load (TL) on a daily and weekly basis is significant and may contribute to the development of MSKI.

Methods: Forty recruits, 8 females and 32 males, (age 24 ± 5 years; height 176.4 ± 10.4 cm; weight 58.8 ± 38.1 kg) were monitored with an accelerometer on their wrist throughout the 10-week BMQ. During week one and ten, the recruits completed the Pittsburgh Sleep Quality Index, performed the Fitness for Operational Requirements of Canadian Armed Forces Employment (FORCE) job-based simulation test (JBST) and, a body composition analysis using bioelectric impedance. Injury surveillance was performed over the 10-week BMQ via a questionnaire and a copy of medical limitations after a visit to the Medical Inspection Room (MIR).

Expected Results: Daily and weekly training load variations were significant ($p \leq 0.00$) except between week five and six, with critical weeks during weeks three and four. The recruits accumulated 95 days under medical limitation (ML) with an average of 3.8 days per consultation which occurred mainly (52%) during week four and five. The majority of the MSKIs were to the lower limbs (79%), caused by activities with repeated motion (62.5%), whereas only 20.8% of the MSKIs were traumatic. The average sleep duration was 5.4 hours per night, however during field exercises it decreased to an average of 3.8 hours per night. The performances on the FORCE-JBST didn't significantly improved, but for male only the V_{O2peak} significantly improved (PRE:POST; 48.7 (4.9): 51.6 (4.9) $p \leq 0.003$).

Conclusions: Training load intensity appears to be related to the development of MSKIs and could perhaps be reduced by applying load management principles. Tracking training load alongside with injury surveillance periodizing physical training and identifying factors and mechanisms associated with injuries is a key step towards injury moderation and performance improvement during BMQ.

5A02: Self-reported Injuries among Canadian Armed Forces Personnel: Results from the 2019 Canadian Armed Forces Health Survey

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¹Department of National Defence

Introduction: Injuries are common among Canadian Armed Forces (CAF) personnel and have implications for overall health, well-being, career progression, and operational readiness. An improved understanding of injury risk factors in this population is required to develop targeted and effective programs and policies to reduce the overall burden of injuries. In 2017/18, the Directorate of Force Health Protection, in collaboration with Statistics Canada, developed the Canadian Armed Forces Health Survey (CAFHS), a population-based cross-sectional electronic health survey that collected data on a wide range of demographic, occupational, and health and lifestyle factors, including acute and repetitive strain injuries (RSIs). The purpose of this study is to present the key survey findings related to injuries among Regular Force personnel.

Methods: The CAFHS was sent to a stratified random sample of CAF Regular Force personnel in 2019 by email. In total, 13,065 Regular Force personnel (39.6% of respondents) completed the survey. Respondents were asked to report acute injuries and RSIs that they had experienced in the past year and to describe their injury by type, body part, associated activity, perceived effects on daily activities and military career, and need for medical care. A descriptive analysis was performed to summarize the data using percentages, odds ratios, and 95% confidence intervals. In addition, cross-tabulations were conducted to identify demographic,

occupational, and lifestyle factors associated with injuries. All results were weighted to account for the complex survey design.

Results: Overall, 22.7% of Regular Force personnel reported experiencing a serious acute injury and 30.6% reported experiencing a repetitive strain injury (RSI) in the past 12 months. The most common types of acute injuries sustained in the past 12 months were sprains or strains, broken or fractured bones, concussions or other brain injury, and cut, puncture, bite or open wound. Acute injuries were more common among personnel less than 30 years of age, junior non-commissioned members (NCMs), and Army personnel, while RSIs were more common among personnel 40 years of age and older, females, NCMs, and Army personnel.

Conclusions: Injuries present a substantial health burden to the CAF and disproportionately affect certain population subgroups. The results of this study provide additional insights into population groups at-risk and circumstances surrounding injury incidence. This information can be used to design injury prevention initiatives to reduce injury risk among CAF personnel and to guide further injury prevention research.

5B01: Canadian Freeze-dried Plasma: An update

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Introduction: Freeze-Dried Plasma (FDP) is a promising blood component for hemostatic resuscitation in the prehospital settings and battlefield. Additionally, the COVID-19 pandemic highlights the need to stockpile blood products with long shelf-lives (e.g., FDP) to be self-sufficient in a national crisis.

In collaboration with Canadian Blood Services (CBS) and Defence Research and Development Canada (DRDC), Canadian Forces Health Services has developed Canadian-sourced FDP (C-TFDP) using a Terumo BCT freeze-drying system. Here, we present an overview of our completed work on C-TFDP.

Methods: We conducted a retrospective analysis of global and specific hemostatic profiles of C-TFDP in comparison with the plasma pools from which it was made. We also begun discussions regarding upcoming clinical studies aiming for licensing the C-TFDP product.

Results: To date, two independent studies have been completed on the same set of C-TFDP samples produced from six pools of Canadian-sourced plasma. The two studies reported extensive head-to-head comparison of hemostatic properties between the plasma pools and corresponding C-TFDP, and are concordant with one another. The research led by DRDC demonstrated no difference in global hemostasis as measured by thromboelastometric parameters between C-TFDP and its plasma

source. The other led by CBS reported that among 18 tested parameters including coagulation factor activities, coagulation- or fibrinolysis-related protein levels, prothrombin time (PT), and partial thromboplastin time (PTT), there were no significant differences in fibrinogen, FII, FXI, ADAMTS13, and protein C activities, or in D-dimer, and thrombin-antithrombin complexes levels, between the plasma pools and derived C-TFDP. Changes in all other factors attributable to freeze-drying were limited to <15%. For the parameters (fibrinogen, FV, FVIII, antithrombin, D-dimer, protein S, PT, PTT) assessed by both studies, largest losses in protein activities were observed for FV and FVIII, respectively, while PTs were elevated 7.4% and 5.9%, and PTTs were elevated 8.5% and 6.9%, respectively. Furthermore, the two studies showed no changes in the levels of immune-inflammatory mediators, and in the levels of activated complement factor 5 and osmolality, respectively before and after freeze-drying.

Our current work is focused on acquiring Health Canada approval of a multicentre, adaptive randomized, active-control, single-blinded study to evaluate the clinical effectiveness of C-TFDP compared to frozen plasma in adult cardiac surgery patients and to submit innovative technology application for licensing of the product.

Conclusions: We have demonstrated a high-quality C-TFDP product that showed comparable hemostatic properties with its initial plasma. Clinical studies evaluating its clinical benefits in severe bleeding patients are recommended.

5B02: CounterFlow Hemostatic Powder Increases Survival from Non-compressible Truncal Hemorrhage When Delivered Percutaneously into Swine

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Introduction: Non-compressible truncal hemorrhage (NCTH) remains the leading cause of preventable death on the battlefield accounting for approximately 67% of all deaths. Currently, definitive management of NCTH requires immediate surgery at Role 2 field stations or by forward surgical teams (FST). In the prehospital environment, minimally invasive strategies are needed to stabilize bleeding casualties and prevent the development acute traumatic coagulopathy, which increases mortality up to four-fold. We have designed a drug delivery system called CounterFlow which uses self-propelling particles carrying Health Canada-approved hemostatic agents that self-propel throughout flowing blood in wounds and cavities. Here, we demonstrate

that CounterFlow could be deployed to manage NCTH from a major liver injury in swine.

Methods: Swine underwent a laparotomy and splenectomy, and controlled hemorrhage was performed to remove 35% of the total blood volume. 1 L of crystalloid solution was infused to induce dilutional coagulopathy, and ice packs were placed in the abdominal cavity to induce hypothermia and subsequently removed. A Grade V injury was created to the left lateral lobe of the liver and the laparotomy was closed with sutures. All animals received 1 g of TXA (25 mg/kg) intravenously. Animals were randomized to receive the CounterFlow intervention together with standardized crystalloid resuscitation, or crystalloid resuscitation alone (n=5 per group).

Results: CounterFlow was delivered percutaneously into the closed abdomen as a minimally invasive procedure that took 3.8 +/- 0.5 min (mean +/- SEM) and dispersed throughout the entirety of the peritoneal space forming robust clots. The median survival time of animals receiving CounterFlow was 61 min vs 31 min (p=0.016) in control animals. CounterFlow increased overall survival (Kaplan-Meier p=0.07) at three hours post-injury.

Conclusions: Effective management strategies for NCTH are one of the greatest unmet needs in both military and civilian trauma. CounterFlow increased survival in this highly lethal swine model of truncal hemorrhage. It has several expected advantages compared to injectable intra-abdominal foams and other materials under development for NCTH: i) it can be delivered without a surgical laparotomy, which could allow it to be administered closer to the point of injury such as in Role 1 medical treatment facilities (MTF); ii) it safely delivers thrombin and tranexamic acid to activate blood coagulation in wounds and additionally stabilize the formed clot; iii) CounterFlow can be reabsorbed by the body after hemorrhage and would not commit the patient to surgery for its removal.

5B03: Advanced Development of CounterFlow Hemostatic Gauze Which Halts Severe Junctional Hemorrhage Without Manual Compression

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Introduction: Junctional hemorrhage—caused by

injury to the groin, neck, or axilla—is the second-highest cause of hemorrhage-induced death in combat settings (19% of cases, 5% of prehospital deaths). An estimated 5% of combat fatalities in Afghanistan could have been prevented by effective control of junctional hemorrhage. The effervescent, self-propelling formula of CounterFlow Gauze delivers tranexamic acid (TXA) and thrombin into wound cavities, halting severe hemorrhage rapidly at point of injury. Previously, CounterFlow Gauze significantly increased 3-hour survival in a swine model of lethal femoral artery bleeding (8/8, 100%) compared to Combat Gauze (3/8, 37.5%) without compression. Here, we summarize the recent progress in translating CounterFlow Gauze towards future battlefield use.

Methods: An automated coating method for manufacturing CounterFlow Gauze has improved dose accuracy, increase intuitiveness of use, and reduce the number of components by half. The CounterFlow formulation was reformulated with excipients which increased handling, ruggedness and increased thrombin stability through storage. The size and composition of the gauze substrate were optimized for expedient packing. Packaging was screened and validated. The refined CounterFlow Gauze was tested in a standard swine model of lethal junctional hemorrhage. Female swine were anesthetized and underwent a 6 mm femoral arteriotomy. After 30 seconds of free bleeding, wounds were loosely finger-packed by a single operator with a hemostatic dressing; wounds were not compressed. All pigs were resuscitated with Lactated Ringer's solution to maintain a MAP > 60 mmHg.

Results: Refined manufacturing processes, product design, and formulation have improved CounterFlow Gauze's physical properties, useability, cost, and shelf life. CounterFlow Gauze was compared to Combat Gauze by a Canadian Armed Forces Trauma Surgeon in the swine model of junctional hemorrhage. The survival rate of animals in both groups was 100% at 3 hours without compression. Blood loss was the same between CounterFlow Gauze (12.4 ± 8.3, mean ± SEM; n=4) and Combat Gauze (14.12 ± 6.4; n=5, p=0.87). In a separate experiment led by non-surgeon physicians at an independent site, CounterFlow Gauze demonstrated a 3-hour survival rate as high as 75% (n=12) without compression, which was superior to other less optimized CounterFlow Gauze iterations (n=10-12 per group, p<0.05).

Conclusions: Counterflow Gauze has increased survival in multiple pre-clinical animal studies. The ongoing development of this new dressing has the potential to impact serving CAF members, veterans, and their families by reducing death and disability due to hemorrhage from external injuries on the battlefield.

5B04: The History and Rebirth of Canadian Freeze Dried Plasma

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Introduction: Massive haemorrhage remains the primary cause of preventable mortality and morbidity on the battlefield. Lightweight, easy to use, resuscitation products remain elusive in austere environments. The Canadian Armed Forces (CAF) along with Canadian Blood Services (CBS) are currently involved in the development of long-lasting and efficacious freeze-dried plasma (FDP) as a potential tool to improve point of injury resuscitation. Here we discuss and update Canada's record as a leader in the development of freeze-dried blood products.

Methods: We collected primary historical data in May 2018 at the Connaught laboratory Museum and Archive located on the Sanofi Pasteur campus, Toronto Ontario. We reviewed correspondence, personal notes, photographs, artifacts along with other primary resources.

Expected Results: Here we delve into the foundation of Connaught Laboratories at the University of Toronto and their evolution as the production leader of freeze-dried blood products. Through an interesting cast of characters, including Dr Charles Best, we reveal the story of how Canada would be a leader in the research, development and production of resuscitative medicine during World War II.

Conclusions: The CAF and CBS are developing a new and all Canadian freeze-dried plasma (cFDP). This will be particularly useful to the CAF in response to a critical need for resuscitation products in military environments. Given the remote nature of Canada, cFDP further lends itself to the civilian side, in particular traumas in austere environments. The story of Canada's leadership and ingenuity in early resuscitative medicine provides both an interesting context and inspiration as we rediscover tools to manage massive bleeds.

5C03: A Retrospective Analysis of the Impact of an Interdisciplinary Local Initiative on Thoughts and Functioning of Patients who Experienced Chronic Pain

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Introduction: Chronic pain is a global issue that affects members of the military, as well as the general population. By the nature of their profession, musculoskeletal injuries are frequent both in garrison and in operational theaters. Karasel, Cebedi and Somnez (2020) who studied military populations, indicate that there is strong evidence for a significant contribution from the psychological characteristics and pain-related beliefs in pain reported levels. According to several sources interdisciplinary management for the rehabilitation of chronic pain in a civilian

population is the gold standard treatment. A bio-psychosocial approach aimed at self-management of symptoms appears to be an effective strategy when working with this clientele. Therefore, health care professionals must acquire a multidimensional perspective and treatment approach.

Musculoskeletal injuries are the leading cause of chronic pain in retired military members and accounts for 42-60% of releases from the forces. Furthermore, an interdisciplinary approach to treating chronic pain should be exercised when working with military clients. Interdisciplinary programs like the one used in this study, specifically designed to this clientele are not common in Canadian Armed Forces (CAF) health services clinics.

Participants took part in an intensive 7-week interdisciplinary program including services from occupational therapy, physiotherapy, kinesiology, pharmacy, psychiatry, and mental health. The initiative included individual sessions, psycho-educational sessions, workshops and daily supervised physical activity sessions.

Methods: This is a retrospective analysis of data collected since the implementation of the chronic pain management course in 2015 until 2021. Data from 110 participants includes, self-reported questionnaires at the start and end of the program on functional status, catastrophic thoughts, perception of injustice, kinesiophobia and psychological distress. Included in the evaluation was a qualitative questionnaire regarding their perceptions of the intervention.

Data collected will be examined via descriptive statistics and statistical analysis to determine the impact of the initiative.

Expected Results: The results are anticipated to be positive on the variables assessed. Initial review of qualitative questionnaires show beneficial changes and utility of the program. Final results are still under investigation and will be presented at CIMVHR 2022.

Conclusions: Due to increasing concerns of chronic pain conditions in the military, the implementation of interdisciplinary programs like this initiative are highly recommended by the literature. The unique demands of CAF, require programs which are adapted to a military context. Since few programs of this nature exist it is essential to analyze the outcomes for future adaptations and foster the interdisciplinary approach to chronic pain management.

6E04: Improving the Referral Process for Orthopedic Services: Results of the rehabilitation medicine access program (orthopedics)

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Introduction: Prolonged wait times for orthopedic services

Poster Presentations

P118: Unintentional Injury-related Hospitalization and Mortality in Canadian Armed Forces Personnel

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Introduction: Injuries are highly prevalent and figure among the leading causes of lost productivity, medical care and hospital bed days in the military population. In Canadian Armed Forces (CAF) personnel, injuries are among the leading causes of medical release and mortality. To prevent injuries effectively, injury control efforts require epidemiological information. To inform CAF injury prevention efforts, this project offers information on the number of injury hospitalizations and deaths due to unintentional injuries by injury type and injury location.

Methods: This project used data from the Canadian Forces Cancer and Morality Study (CFCAMS), a record linkage study with CAF personnel data, the Statistics Canada Canadian Vital Statistics Deaths Database, and the Canadian Institute for Health Information Discharge Abstract Database. Unintentional injury-related deaths and hospitalizations were identified and categorized using the Injury Mortality Diagnosis Matrix and the Centers for Disease Control and Prevention's framework for presenting injury mortality data. Injury hospitalizations and deaths due to self-harm, assault, and operations of war were excluded from this analysis due to data limitations. Additionally, hospitalization data were not available in the province of Quebec.

Injury-related hospitalizations and deaths were included from 2001 to 2014, inclusive, for Regular Force CAF personnel. All results presented are rounded to the nearest 5 observations and categories with fewer than 5 observations were collapsed to protect participant privacy.

Expected Results: In the study period, there were 155 unintentional injury-related deaths. Most deaths were due to motor vehicle collisions (95, 61%), air and space transport accidents (15, 10%) and falls (10, 7%).

1,845 hospitalizations were observed in this period. Most injuries occurred to the extremities (1,195, 65%), to the head and neck (275, 15%) or to the torso (195, 11%). The most frequent types of injuries were fractures (1,080, 59%), internal organ injuries (160, 9%) and open wounds (75, 4%).

Conclusions: These results are part of a larger CFCAMS injury research project which seeks to estimate the severity of injuries sustained by CAF personnel, demographic and occupational risk factors for injuries, and to estimate the effects

represent a substantial barrier to care for musculoskeletal (MSK) conditions and contribute to increased health risks to patients and health care costs. Referrals to orthopedic surgery, for which conservative management is more appropriate, significantly contribute to these wait times. One strategy implemented to reduce the proportion of referrals not resulting in orthopedic intervention and to improve wait times for orthopedic services is the use of physiotherapy-led triage for orthopedic referrals. To decrease the percentage of referrals to orthopedic surgery for which conservative management is more appropriate, a physiotherapy-led triage program that uses electronic medical record (EMR) screening was implemented in November 2019 within a military primary health care centre in Halifax, Nova Scotia. The purpose of this study was to determine the effectiveness of the program in referring patients for orthopedic intervention, as compared with patients directly referred to orthopedic services by their primary health care provider.

Methods: Using a time framed sampling methodology, the EMRs of 119 patients referred for orthopedic consult by their primary health care provider prior to program implementation and 102 patients referred post program implementation were retrospectively reviewed by physiotherapists using a validated screening tool. To be considered eligible for orthopedic consult, patients in the program group met at least one inclusion criterion and none of the exclusion criteria. Orthopedic intervention rate (OIR), surgical conversion rate (SCR), as well as patient demographics were compared for preprogram and program groups.

Results: There was no statistically significant difference between groups for mean age and sex. The OIR and SCR in the preprogram group were 47.9% and 30.3%, respectively, and the OIR and SCR for the program group were 63.7% and 43.1%, respectively. The increase in OIR and SCR in the program group represents a statistically significant difference. There was a 50% decrease in physiotherapy referrals post orthopedic consult from the preprogram to program group.

Conclusions: Physiotherapy-led screening of EMRs has the potential to be an effective and efficient method for triaging orthopedic referrals and optimizing access to orthopedic services. In addition to decreasing wait times, the program reduces the requirement for patients to be physically present in the health care setting for triage. Furthermore, there is the opportunity for those patients identified as needing conservative management such as physiotherapy to access conservative treatment and begin rehabilitation earlier in the injury process, potentially accelerating return to duty for military personnel.

of injuries on personnel retention. This preliminary analysis identifies the most common causes of injury-related death and hospitalization in CAF personnel.

P119: Remote Ischemic Conditioning in Traumatic Brain Injury Patients: A pilot randomized control trial

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Introduction: Management of Traumatic Brain Injury (TBI) is currently aimed at secondary brain injury prevention that results from brain ischemia. Remote ischemic conditioning (RIC) is a non-invasive intervention that has been shown to lessen ischemia/reperfusion (I/R) injury and potentially reduce tissue/organ injury damage. In humans, RIC showed amelioration of neuronal injury-specific markers, neuron-specific enolase, and S100B, in TBI patients. S100B and its receptor for advanced glycation end-products (RAGE) are among the best predictors of neuronal injury. Given the effect of RIC in mitigating injury, we hypothesized that RIC would exert beneficial effects on TBI patients by decreasing levels of S100B and RAGE.

Methods: A randomized double-blinded controlled clinical trial with two intervention arms (sham; RIC) is in progress on moderate to severe traumatic brain injury patients admitted to the ICU at St. Michael's Hospital, Toronto, Canada (REB17-278). Patients were computer randomized between the sham and RIC treatments. Measures of neural injury and inflammatory cytokines in the plasma at 0h (pre-intervention) and 6, 24, 48, and 72h (post-intervention) will be the primary outcome measure. Secondary outcome measures will include clinical data and neurocognitive assessments. Eligibility criteria include the presence of intracranial hematoma on CT scan, and a Glasgow Coma Scale score ≤ 12 . RIC procedure involves 4 cycles of 5-minute occlusion at 30mmHg > SBP, followed by 5-minute deflation on an arm (using Zimmer ATS3000) within 48 hours of injury. Currently, the trial has enrolled 29 out of 40 patients. Preliminary analysis was conducted on 19 patients' plasma from adult TBI patients (9/RIC and 10/Sham group) at admission, 24 and 72h later. Plasma concentrations (pg/mL) of S100B and RAGE were measured by ELISA (Duo-kits, R&D systems) and expressed as mean/SEM.

Expected Results: Systemic S100B levels are increased in TBI patients over the cut-off value for healthy individuals (100 pg/mL). In sham patients, S100B levels showed no change over time (10,884/2,799 at 0h; 11,746/3968 at 72h). In the RIC group, S100B decreased over time from 9,338/2531 (0 h) to its lowest level, 3929/843 (72 h). This trend may be confirmed by

study completion. A strong correlation between S100B and RAGE levels was observed in the RIC group only (0.79; 72 h timepoint).

Conclusions: We report that RIC demonstrates promising preliminary results in limiting post-injury elevations in S100B levels observed in TBI patients. Completed results of the ongoing trial will further elucidate the mechanisms and outcome of RIC treatment as a potential novel adjunctive therapy for moderate to severe TBI.

P120: Hearing Impacts of Breaching and Sniper Course Participation

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Introduction: Service members encounter diverse sources of noise during military operations and training. Prior research from the Canadian Forces School of Military Engineering (CFSME) suggested that the average peak blast overpressures ranged from 1.6 to 2.1 PSI (174 to 177 dB) during breaching courses. In this study, hearing data were collected as part of a cross-sectional study of CANSOFCOM breachers and snipers during training to assess the effects of long-term exposure to repeated occupational blasts on health and performance measures.

Methods: Hearing measures were taken from breaching course instructors and students (n=15) and sniper course instructors and students (n = 27), prior to and after participation in a training course. Measures from an age- and sex-matched control group were taken on two separate days. Hearing data comprised objective measures of pure-tone hearing thresholds measured at 0.5 to 8 kHz and the Canadian Triple Digit Test, as well as survey questions on occupational and recreational noise exposure, auditory injuries, tinnitus, and the Hearing-Dependent Daily Activities scale. Some participants were instrumented with the B3 Blast Gauge sensors that were mounted to the back of their helmet, chest, and the non-firing shoulder. Gauges captured peak overpressure for each detected blast event. Data were analyzed through Matlab's Statistics and Machine Learning Toolbox.

Expected Results: There were significant changes in high frequency (4-8 kHz) hearing thresholds measured post-course (*pp*Snipers also experienced worse hearing thresholds for high frequencies in the left ear post-course ($p = 0.08$). Prevalence of tinnitus was higher for both experimental groups compared to controls. However, this difference was not statistically significant. Considering the Triple Digit Test, course participation significantly decreased the speech reception thresholds in snipers ($p < 0.05$) while breachers experienced more varied results ($std = 0.91$). Blast gauges captured distinct

exposure profiles between shooting and blasting. There were 65 incidents of blasts over 4 psi recorded from participants on a breaching course. Chest gauges captured 74% of severe exposure readings.

Conclusions: Participation in training involving weapon discharge and explosions exposes individuals to pressure waves that cause measurable changes in audiological function. Further investigation may reveal a dose-response relationship between blast gauge measures and the impact on audiological function. An accurate understanding of service members' exposure to hazardous conditions and its subsequent impact will aid in the provision of practical protective equipment and improve recommendations for operating procedures.

P121: Musculoskeletal Injuries at Canadian Forces Health Services Centre (Atlantic) Physical Rehabilitation Section (Stadacona) During the COVID-19 Pandemic: Injury profiles and lessons learned

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Introduction: The COVID-19 pandemic has resulted in changes in patients' clinical presentations and health care needs, both within the Canadian Armed Forces (CAF) and the Canadian population as a whole. It was expected that the pandemic would result in a significant decrease in physiotherapy referrals to the Physical Rehabilitation Section at Canadian Forces Health Services Centre (Atlantic) (CF H Svcs C(A)), and a noticeable change in injury profiles. Due to provincial and base-wide restrictions, as well as decreases in sport and physical training participation, it was anticipated that CAF personnel would present with fewer acute injuries to their knees and shoulders (historically the second and third most common body part to be injured, respectively). A higher proportion of chronic low back and neck complaints secondary to work-from-home arrangements and lack of activity were also expected. This projected change in injury profiles would present as: 1) fewer total physiotherapy referrals; 2) lower percentage of Priority 1 referrals and higher percentage of Priority 3 referrals compared to historical values; and 3) lower proportion of knee and shoulder injuries and higher proportion of back and neck complaints compared to historical values.

Methods: Total referral numbers from 2018 and 2019 were used as a baseline (pre-COVID) and compared to data from 2020 and 2021 (post-COVID). Referral priority and body part were further expressed as percentages and compared across all four years. There were insufficient data points to allow for meaningful statistical analysis, therefore a visual comparison was used.

Results: A total of 1506 physiotherapy referrals were received in 2020, and 2092 in 2021. When comparing the body parts

with the highest injury rates (back, knee, and shoulder), the proportion of referrals post-COVID remained very similar to historical numbers. The same was seen for neck complaints, which are an overall low percentage of total referrals. Referral priority percentages were also near-identical across all four years, with the exception of a slight increase in Priority 1 referrals (27.6%) in 2020 compared to pre-COVID trends (22.7%).

Conclusions: As expected, total referral numbers at Stadacona decreased to 65% of the historical average in 2020, but returned to 90% in 2021. The near-parity noted in pre- and post-COVID injury profiles and priorities was surprising and requires further exploration. The aim of this presentation will be to further examine possible explanations for these findings, and provide lessons learned and recommendations for the future.

P125: Associations Between Female Reproductive Health and Lower Body Injuries in Female Service Members of the Canadian Armed Forces

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Introduction: Repetitive strain injuries (RSI) are a type of musculoskeletal injury (MSKi) that occur in muscles, tendons, or nerves through overuse or repetition of movement overtime. Canadian female service members (FSM) experience higher rates of RSI when compared to males. Anatomical and physiological differences, including female reproductive health factors could be contributing to this disparity. Irregular menstruation for example, has been associated with decreased bone mineral density and remodeling leading to higher rates of hip stress fractures in FSM. Moreover, hormonal contraceptives (HC) were found to be preventive for knee and hip MSKi in female athletes. We investigated associations between menstrual cycle periodicity (MCP) and usage of HC on lower body RSI rates among FSM in the Canadian Armed Forces (CAF). It is hypothesized that (i) FSM experiencing menstruation dysfunction have a higher probability of reporting lower body RSI, and (ii) the lack of HC use will be associated with lower body RSI.

Methods: A cross-sectional study was performed as a sub-analysis of a larger study investigating sex-disparities related to MSKi, reproductive health, recruitment, and retention in the CAF. An electronic questionnaire (SurveyMonkey Inc.) was distributed to CAF service members between September 2020 and February 2021. Inclusion criteria were: i) serving, retired, or medically released members of the CAF, ii) between the ages of 18-65 years, iii) able to provide informed consent, and iv) indicated biological sex. 657 FSM, all having answered "female" for biological sex, were used for the chi-square tests of independence to test bivariate association of HC usage, and MCP (i.e., regular or irregular cycles) with rate

of lower body RSI (e.g., hip, thigh, knee, lower leg, ankle, foot, and toes).

Results: A statistically significant association between irregular MCP and higher rate of RSI in hip, knee, lower leg, and toes ($X^2(1) = 12.783, p < 0.001$; $X^2(1) = 8.026, p = 0.005$; $X^2(1) = 8.738, p = 0.003$; $X^2(1) = 4.220, p = 0.040$, respectively). No association was found between HC usage and lower body RSI.

Conclusions: Female CAF members with irregular MCP reported higher rates of RSI in the hip, knee, lower leg, and toes, confirming our first hypothesis. However, no significant association between HC usage and lower body RSI in FSM was observed. These findings indicate reproductive health may increase risk of lower body RSI for FSM. Future studies should investigate how irregular menstrual cycle periodicity and lower body RSI effects performance of physical task.

P126: Care of the Military Neck: Introducing Novel Equipment in Canadian Forces Health Services Physiotherapy Departments.

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Program/Intervention Description: Musculoskeletal injuries are the primary reason for health care utilisation, modified duties and disability in armed forces around the world. Neck pain is the 4th leading cause of disability worldwide and 6% of military personnel suffer from chronic neck issues. While this may not seem like a concerning number, the incidence of neck pain is reported to be between 19% and 85% in the civilian sector. The professions that have the highest incidence are also represented in the military with the added burden of maintaining military standards and helmet use.

The clinical practice guidelines for neck pain recommend coordination, strength and endurance exercises for reducing pain but specifically which exercises to use and measuring objective change is largely missing from the literature.

In September 2020, through Innovation Solutions Canada, Canadian Forces Health Services (CFHS) purchased 100 TopSpin360 helmets which were implemented at 18 CFHS physiotherapy departments. TopSpin360 is a football style helmet. It has a centrally mounted axis attached to the top with a freely spinning, lightly weighted, arm mounted to it. Patients use small head movements to initiate and maintain the small arm spinning. This movement uses coordination and strength and as the patient improves they are able to increase the speed of the rotation thereby training the cervical spine

muscles dynamically. Metrics of performance are collected which can be used to measure change over time.

Evaluation Methods: As part of the Innovation Solutions project, standardised testing data was collected by physiotherapists and sent to the National Physiotherapy Rehabilitation Coordinator to be evaluated.

Collected measures include:

- cervical isometric strength;
- endurance;
- rate of force development on TopSpin360; and
- patient reported outcome measures.

Data will be analysed pre- and post-training on TopSpin360 to determine changes in patient performance and self-reported disability.

Results: Due to the global pandemic many clinics had difficulty fully implementing the protocols, complete data is available at this time for 20 patients. It is expected that by October 2022, more data will be collected for analysis. Positive changes in neck strength, endurance, patient disability are expected.

Conclusions: TopSpin360 is a novel neck strengthening device that enables dynamic strengthening not previously available in CFHS physiotherapy departments. Despite challenges with implementation due to the pandemic, it offers clinicians and patients a training platform which may contribute to improved outcomes, faster return to duty and decreased injury rates. Further research is required to fully examine the potential of this device for Canadian Forces members.

P135: Canadian Armed Forces Cancer and Mortality Study: Linkage update and preliminary results

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Introduction: The Canadian Forces Cancer and Mortality Study (CFCAMS) is a collaborative population health record linkage study between the Department of National Defence (DND) and Veterans Affairs Canada (VAC), facilitated by Statistics Canada. CFCAMS seeks to study the demographic and occupational risk factors for cancer and mortality in Canadian Armed Forces (CAF) serving personnel and veterans.

Methods: CAF remuneration records are used to enumerate Canadians with a history of military service and contain demographic information such as date of birth and sex, as well as occupational information such as rank, trade and

deployment history. These records have been linked by Statistics Canada to the Canadian Vital Statistics Deaths Database, using deterministic and probabilistic methods. The linked database contains information on the date and cause of death of Canadians with a history of CAF service.

The latest CFCAMS linkage includes Canadians with a history of CAF Regular Force and Reserve Force class C service, who first started serving between 1975 and 2019. The Canadian Vital Statistics Deaths Database is complete to 2016, all data thereafter are considered preliminary. The resulting CFCAMS database has been cleaned by DND and VAC epidemiologists.

Preliminary descriptive analyses have been performed to enumerate the CFCAMS participants and causes of death by ICD-10 chapter. Due to changes to ICD coding, deaths occurring prior to 2000 were excluded from this preliminary analysis.

Expected Results: At the end of the study's observation period, the cohort includes 63,715 actively serving personnel and 254,475 veterans. The most common causes of death by ICD chapter were neoplasms ($n=10,500$, 35.7%), diseases of the circulatory system ($n=7485$, 25.5%) and diseases of the respiratory system ($n=2010$, 6.8%).

Conclusions: The new CFCAMS linkage extends the study's observation period for the cohort from 2014 to 2019, while extending the observation period for mortality from 2014 to 2016. This preliminary report describes the study cohort contained in the newly linked database and presents descriptive statistics on causes of death, with neoplasm found to be the most common cause of death.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

1A01: Prevalence and Correlates of Cannabis use Among Mental Health Treatment-seeking Canadian Armed Forces Members and Veterans

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Introduction: Canadian Armed Forces (CAF) members and Veterans are at increased risk of posttraumatic stress disorder (PTSD) and other mental health (MH) conditions compared to civilians [1]. While PTSD treatment guidelines exist [e.g., 2],

efficacy within Veteran populations may be diminished [3], and a proportion of Veterans may turn to cannabis for symptom relief [4]. This study aims to: 1) describe the prevalence of current cannabis use among MH treatment-seeking CAF members and Veterans; 2) estimate the association between current cannabis use and a number of physical and mental health-related conditions, including PTSD, depressive, anxious, and alcohol use symptom severity, chronic pain, and sleep quality; and 3) identify sociodemographic and health-related variables associated with current cannabis use.

Methods: This study used retrospective data collected from a convenience sample of 415 CAF members and Veterans attending a specialized outpatient mental health clinic for operational stress injuries between January 2018 and December 2020. Participants' current cannabis use was categorized as no use, use for medical purposes, and use for recreational purposes. Participants who endorsed using cannabis for medical and recreational use were excluded from the analyses due to small numbers. Mean symptom severity scores were compared by current cannabis use status using ANOVA and Tukey post-hoc tests; and sociodemographic and health-related variables associated with current cannabis use type were identified via multinomial logistic regression.

Results: The majority of the sample were Veterans of the CAF (92.3%; $n = 383$). Most participants met the recommended cut-off for probable MDD (82.2%; $n = 341$), probable PTSD (74.0%; $n = 307$), and probable GAD (73.7%, $n = 306$). One-quarter (25.5%, $n = 123$) met the cut-off score for potentially harmful alcohol use. 41.5% of participants ($n = 187$) reported current cannabis use, with about half that indicating use for medical purposes ($n = 93$). Individuals who reported current cannabis use for medical purposes tended to have higher symptom severity scores than recreational or non-users across MH conditions [e.g., depression: $F_{Welch}(2, 226) = 2.59$; $p = 0.08$; Cohen's $f = 0.11$]; however, no significant difference across groups was noted for PTSD scores [$F(2, 693) = 1.03$; $p = 0.36$; Cohen's $f = 0.07$].

Conclusions: Veterans who reported current cannabis use for medical purposes tended to have higher symptom severity scores across a range of psychometric measures. Potential explanations for observed differences and clinical implications of cannabis use, both recreational and medical, in this population will be discussed.

1B01: Visibility and Validation: Using mentorship to support military sexual trauma among women in the Canadian Armed Forces

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Introduction: In *Strong, Secure, Engaged: Canada's Defence*

Policy, there is a commitment to increase women military personnel to 25% of the Canadian Armed Forces (CAF) by 2026. A strategy used in similar male-dominated organizations to increase the recruitment and retention of women is the adaptation of gender-specific mentoring programs. This is a way to acknowledge and support the experiences of women military members that may include exposure to and survival of sexual trauma within a very specific cultural environment, the military. During the process of creating a gender-informed, culturally competent mentorship framework to support women members of the CAF, some important findings were identified highlighting the use of mentorship in supporting women who have experienced military sexual trauma (MST).

Methods: For exploratory research such as this, a constructivist qualitative approach is appropriate as reality is created through multiple perspectives from participants. Semi-structured interviews informed by the Critical Incident Technique were used for data collection and Framework Data Analysis approach was used for analysis. There was no effort made to limit the diversity in the study population in hopes of allowing variability in sampling (e.g., gender, rank, element, location) which is important when striving for intersectionality in research design.

Results: Twenty-eight interviews were completed with subject matter experts and currently serving members of the CAF who all have experience mentoring women or being a woman mentee. Through the interviews, there was evidence indicating that mentorship is being used to support women's experiences of MST. Participants reported using mentorship to create a system of support when they were feeling isolated due to their trauma. Participants also used mentorship to share information about services related to MST. Finally, participants shared how mentorship gave them the strength to challenge the culture that enables MST to occur.

Conclusions: The purpose of the study was to gain an understanding of mentorship for women in the CAF. It became clear that mentorship provides a mechanism that women are using to express their intolerance for things such as sexual misconduct. The study results begin to explore how mentorship, a network to support psychosocial and career development, is being used by women to push culture change. The structure of mentoring relationships is proving women with the confidence and the ability to speak up in a way that was unavailable for those who came before them.

3A02: Organizational Climate Around Sexual Misconduct in the Canadian Armed Forces: Results from the 2019-2021 Your Say Surveys

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Introduction: Sexual misconduct in the workplace has

detrimental effects on victims and on the organizational climate, and it is particularly problematic in the military. In order to monitor the progress made towards cultural change, aspects of the organizational climate pertaining to sexual misconduct were included in the annual Your Say Survey (YSS). This presentation outlines the relevant results from 2019-2021.

Methods: Regular Force members and Primary Reservists were asked to rate their beliefs on a number of survey items used to assess organizational climate around sexual misconduct. Using weighted data from the 2019 ($N = 3,531$), 2020 ($N = 3,083$), and 2021 ($N = 2,747$) YSSs, CAF members' attitudes regarding willingness to report sexual misconduct, preparedness to intervene when having witnessed sexual misconduct, knowledge of where to go for help when having experienced sexual misconduct, and trust in leadership to effectively deal with sexual misconduct were assessed.

Results: Weighted results from the 2021 YSS revealed that the majority of members felt prepared to intervene when witnessing sexual misconduct (85%), were willing to report sexual misconduct (71%), and knew where to go for help if they experienced sexual misconduct (73%). On the other hand, less than half (46%) reported confidence that they would not be retaliated against for reporting sexual misconduct. Most members believed that their leaders reinforce a culture of mutual respect, honour, and dignity (76%), while roughly 70% believed that reports of sexual misconduct are taken seriously by the Chain of Command (CoC) and reported that they trust their CoC to effectively deal with sexual misconduct. Moreover, results from the 2021 YSS revealed some inconsistencies compared to previous years, suggesting the need for further exploration.

Conclusions: Findings suggest that overall, the majority of CAF members are prepared to handle incidents of sexual misconduct, trust their leaders to effectively deal with sexual misconduct, and believe that leaders reinforce a culture of mutual respect, honour, and dignity. However, some results were inconsistent with previous findings and these inconsistencies will be contextualized and discussed. Continuing to monitor these aspects of the organizational climate will be useful for the CAF as it endeavors to transform its culture.

3A03: Well-being of Members in the Canadian Armed Forces: The protective roles of organizational culture, organizational support, and psychological safety

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¹Department of National Defence

Introduction: The importance of psychological health and safety in the workplace was established in multiple research studies over the last decades as it is linked

to important individual and organizational outcomes. Producing a psychologically safe environment and providing organizational support allows members of the organization to feel engaged, willing to make meaningful contributions to the organization and is believed to be related to better well-being and lower attrition. Moreover, there is evidence that positive organizational culture and support could serve as protective factors for individuals' well-being even in a highly demanding organization. Military life places unique and extremely intense demands on its members, including family separations, relocations and longer work hours. Nevertheless, there has been limited research examining the role of these job resources with job demands and organizational outcomes in the Canadian Armed Forces (CAF).

Methods: The aim of the study was to examine the role of job demands, including role overload, role ambiguity and work-family conflict, and the unique and protective roles of resources, including organizational group culture, organizational support and team psychological safety, in the well-being of Canadian Armed Forces members.

A Defense Workplace Well-Being Survey was administered to a random sample of Regular Force CAF members ($N = 7,061$). Three hierarchical regression analyses were conducted to examine the roles of resources (i.e., organizational culture, organizational support, and psychological safety) and job demands (i.e., role overload, role clarity, and work-family conflict) in predicting the psychological well-being of CAF members, including psychological distress, turnover intention and burnout.

Results: It was found that all job demands examined were predictive of greater psychological distress, burnout and intentions to leave the organization. Moreover, higher scores on organizational culture, organizational support and team psychological safety were predictive of lower psychological distress, burnout and intentions to leave. Finally, organizational support moderated the relationship between role overload and psychological distress, and team psychological safety moderated the relationship between work-family conflict and both psychological distress and turnover intentions.

Conclusions: Consistent with the expectations, this study demonstrates the importance of a positive organizational group culture, team psychological safety and organizational support for individual and organizational outcomes. These factors are not only related to well-being and retention, but also play a protective role by mitigating some of the negative impacts of job demands. It is, therefore, recommended that leaders focus their intervention efforts on ameliorating these protective factors in order to improve the well-being and retention decisions among military members.

3B03: Work-life Conflict among Canadian Navy Personnel

Frank, Christine, PhD¹; D'Agata, Madeleine²

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Introduction: Research suggests that compared to the broader Canadian Armed Forces (CAF) population, Royal Canadian Navy (RCN) personnel experience lower levels of well-being and higher negative work outcomes such as burnout, lowered satisfaction, and higher turnover intentions. These results appear consistent between shore and sea-going units. A recent study found that balancing family life was one of several factors impacting the resilience of RCN personnel. Though a recent review of existing literature has identified some challenges that negatively impact members' abilities to maintain work-life balance, no study has examined these challenges in depth. The goal of this study was to (1) identify the factors associated with work-life conflict affecting members of the RCN and, (2) determine potential policies and practices the organization could implement in order to alleviate work-life conflict.

Methods: A sample of 34 RCN personnel were selected using a purposeful sampling method to ensure the participant pool had diverse characteristics that represented different experiences (e.g., years of service, rank, occupation, unit). Semi-structured interviews were conducted with participants virtually. Qualitative analysis of the interview notes will be conducted using thematic analysis.

Expected Results: Preliminary results suggest that beyond a heavy workload and frequent deployments, some of the primary barriers to RCN personnel fulfilling and maintaining personal responsibilities are: leaders who do not effectively support work life-balance (e.g., sending work-related emails after hours; not leading by example), a lack of control (e.g., sailing schedules), and an unpredictable schedule (e.g., sudden requests to return to work while on leave, last minute changes to duty watch). While sailing, members specifically mentioned their shift rotation schedule, as well as their white space being interrupted, as barriers to recovery. Some of the perceived solutions to the identified challenges include establishing a more predictable sailing schedule (e.g., being provided their sailing schedule in advance, including buffer times for repairs or human error in the sailing schedule), more leadership training and formalized mentorship opportunities for new leaders, more transparency and better communication regarding decision-making, and compressed days and minimal manning when ashore or alongside. While sailing, members suggested ensuring members have an eight hour stretch off to ensure sufficient sleep, and purposely building in, and protecting, white space.

Conclusions: This study provides insights on the challenges

to maintaining a work-life balance among RCN personnel. Findings will help inform policies and procedures to better support RCN personnel.

3C03: Mental Health Outcomes of Male United Kingdom Military Personnel Deployed to Afghanistan and the Role of Combat-injury: The ADVANCE cohort study

Dyball, Daniel, BSc¹; Bennett, Alexander, PhD²; Schofield, Susie, MSc³; Cullinan, Paul, PhD³; Boos, Christopher, PhD⁴; Bull, Anthony, PhD³; Wessely, Simon, PhD¹; Stevelink, Sharon, PhD¹; Fear, Nicola, PhD¹

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Brief Description: The ADVANCE cohort study is investigating the long-term physical and psychosocial health of UK Armed Forces personnel who were physically injured during the recent conflict in Afghanistan. Participants completed a comprehensive health assessment including both physical health and self-reported mental health measures.

In this presentation, the rates of probable PTSD, depression, anxiety and multimorbidity in a representative sample of physically combat injured UK military personnel compared to a frequency matched uninjured comparison group will be described.

Patient Population: 579 combat-injured and a comparison group of 565 uninjured male UK Armed Forces ex-/serving personnel, frequency-matched by age, rank, regiment, deployment era, and role on deployment. 161 of the combat-injured group sustained a primary limb amputation injury and 418 sustained a non-amputation related injury.

Results: The rates of PTSD (16.9% vs 10.5%; Adjusted Odds Ratio (AOR) 1.67 (95% Confidence Interval (CI) 1.16, 2.41), depression (23.6% vs 16.8%; AOR 1.46 (95%CI 1.08, 2.03), anxiety (20.8% vs 13.5%; AOR 1.56 (95%CI 1.13, 2.24) and mental health multimorbidity (15.3% vs 9.8%; AOR 1.62 (95%CI 1.12, 2.49) were greater in the injured versus uninjured group respectively. Minimal differences in odds of reporting any poor mental health outcome were noted between the amputation injury subgroup and the uninjured group, whereas up to double the odds were noted for the non-amputation injury subgroup.

Conclusions: Serious physical combat-injuries are associated with poor mental health outcomes. However, type of injury influences this relationship. Regardless of injury, this cohort represents a group who present with greater rates of PTSD compared to the UK general population and increased psychological burden from multimorbidity.

4B04: The Association between Post-traumatic Stress Disorder Symptoms and Cardiovascular Risk Factors: An ADVANCE cohort study

Dyball, Daniel, BSc¹; Bennett, Alexander, PhD²; Schofield, Susie, MSc³; Cullinan, Paul, PhD³; Boos, Christopher, PhD⁴; Bull, Anthony, PhD³; Stevelink, Sharon, PhD¹; Fear, Nicola, PhD¹

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Brief Description: Post-Traumatic Stress Disorder (PTSD) has been identified as an independent risk factor for the development of Cardiovascular Disease (CVD). Whilst biological pathways theorise the links between symptom clusters of PTSD (hyperarousal, intrusive thoughts, avoidance behaviours and emotional numbing) and CVD, few studies have investigated the relationship between these symptom clusters and cardiovascular risk factors. This study investigates the links between PTSD symptom clusters and cardiovascular risk factors including metabolic effects, inflammation, haemodynamic and endothelial functioning in a cohort of UK military personnel.

Patient Population: 1112 ex-/serving injured and uninjured UK military personnel from the ADVANCE cohort; 974 without PTSD and 138 with probable PTSD.

Results: Hyperarousal symptoms were associated with greater levels of triglyceride and gynoid body fat. Emotional numbing symptoms were associated with a greater resting heart rate. Intrusive thoughts were associated with greater systolic blood pressure and android body fat. Avoidance behaviours were not associated with any cardiovascular risk outcomes. In those without probable PTSD, having high symptom cluster scores versus low symptom cluster scores was associated with minor-moderate increases in levels of triglycerides, resting heart rate, systolic blood pressure and android/gynoid body fat. In those with probable PTSD, having high symptom cluster scores versus low symptom cluster scores were associated with no/minor differences in android/gynoid body fat percentage, but were also associated with moderate decreases in triglycerides, resting heart rate, and systolic blood pressure.

Conclusions: Hyperarousal symptoms are associated with primarily metabolic effects of the cardiovascular system, emotional numbing symptoms are associated with haemodynamic effects and intrusive thoughts are associated with both. Avoidance behaviours were not associated with any cardiovascular risk outcomes. Increased severity of hyperarousal, intrusive thoughts and emotional numbing symptoms were associated with poorer cardiovascular outcomes in those without probable PTSD, however severity of symptoms was either associated with no or minor changes in android/gynoid body fat percentage or decreases in triglycerides, systolic blood pressure and resting heart rate in those with probable PTSD.

Sustained hyperarousal leading to depletion of cognitive resources and subsequent reduced effects on homeostatic responses and the effect of the dissociative subtype of PTSD are possible explanatory theories for the observed differences in symptom cluster effects by PTSD status.

4E01: Advancing Research on Servicewomen and Women Veterans of the Canadian Armed Forces

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Introduction: There is a historic lack of research on women in the defence sector as a result of systemic legacy biases rooted in the historic assumption of the male military and Veteran norm. Over the past decades, research in this area has emerged and is growing in importance as a result of new government policy priorities. This study aims to identify gaps, priorities, and guidelines for advancing Canadian research on the needs, health, and well-being of military and Veteran women through scoping review methodology, including consultation with stakeholders in the field.

Methods: First, we identify gaps in the literature on Canadian servicewomen and women Veterans based on a comprehensive analysis and synthesis of existing scoping and literature reviews, and through comparison with international reviews on servicewomen and women Veterans. Next, we use scoping review methodology (including consultation with key stakeholders) to update existing Canadian scoping and literature reviews on servicewomen and women Veteran research, and identify and prioritize the most significant gaps in Canadian research. Finally, based on our analysis of gaps in the literature, and in consultation with stakeholders and our advisory group of collaborators, we develop a proposal of recommendations for future research on servicewomen and women Veterans in Canada.

Expected Results: This TPL-funded study is still in progress, but analysis will have been completed by the time of Forum 2022. We expect to find that Canadian research on women in the defence sector, while lagging behind compared to international (especially US) research, is occurring across government departments (DND/CAF and VAC) and the civilian research sector. Nonetheless, there are significant gaps in Canadian research on CAF servicewomen and women Veterans in most areas of interest identified in the international literature, as well as a need to better coordinate ongoing Canadian research efforts. We also expect to find that stakeholders and the existing literature will point to the need for future research on CAF servicewomen and women Veterans to pay closer attention to sex, gender, and intersectionality, be more trauma-informed and military-culture aware, and better integrate service women and women Veteran voices into research.

Conclusions: While Canadian research on CAF servicewomen and women Veterans exists, it is underdeveloped, uncoordinated, and could benefit from greater theoretical, conceptual, and ethical engagement. Much more needs to be done to collaboratively and programmatically move forward a pan-Canadian research agenda that reflects the needs, health, and well-being of military and Veteran women.

4E02: Public Attitudes towards United Kingdom Female Service Personnel and Veterans: Results of a household survey

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Introduction: Within the UK military, women currently occupy 11% of the regular Armed Forces and it is the Government's ambition to increase this to 30% by the end of the decade. Additionally, the Secretary of State for Defence (Ben Wallace MP) has made the bold statement that the UK will be the best place to be a veteran. Whilst these ambitions are laudable, there is an underpinning confliction in how the UK will wrestle with providing adequate, let alone outstanding, provision for female veterans when very little is known about their experiences of recovery, transition, help-seeking and care. Importantly, existing research indicates a lack of awareness and understanding of female veterans military experiences and support needs by health and social care professionals, and the wider population (Godier-McBard et al, 2021; 2022).

This presentation considers the findings of the first UK Household Survey exploring public attitudes and awareness of the participation of women in the UK Armed Forces and their needs after service.

Methods: Working with UK government departments (NHS England; Ministry of Defence; Office for Veterans Affairs) and the charity sector (the Confederation of Service Charities) the authors developed 6 high-level questions focused on attitudes towards women's participation in Armed Forces roles, perceptions of female veterans, level of knowledge of female veterans experiences and support needs, and origins/sources of knowledge on female service personnel and veterans.

These questions were administered to a representative household panel (n=2,164) by the global marketing company Ipsos Mori, who provided weighted proportions for each response to each question, alongside an anonymised raw dataset. A secondary analysis of this anonymised dataset will be undertaken by the research team, focused on the impact of socio-demographic factors (i.e., gender, ethnicity, age, region/location, education level) on responses to these surveys. Multivariate logistic and linear regression models will be carried out to determine the associations of these exposures and responses to the survey questions.

Expected Results: Analyses of the household survey dataset is ongoing. Analysis of this dataset will provide an intersectional analysis of responses to these questions, to determine the impact of socio-demographic factors on awareness and attitudes.

Conclusions: This household survey is the first in the UK to explore public attitudes to women experiences and needs during and after military service. This will act as an important barometer for the broader awareness of female veterans needs and experiences in the UK, and will support the development of government policy and service provider training.

5A03: 3BP - Brain Body Balance Plan: A holistic approach to a complex problem

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Brief Description: Over the course of their career, and as a result of different types of exposure and experience, Canadian Armed Forces members could experience a constellation of symptoms that may impact physical and mental wellbeing and performance. Symptoms may be subtle and accepted by the soldier as a standard workplace hazard.

It is often difficult to distinguish repetitive sub concussive (RSCE) related impairment from other conditions. A screen or process with appropriate, sensitive, and specific tools that can effectively determine whether someone suffers from repetitive sub concussive injury (RSCI) is critical to ensure members health as well as performance and operational readiness. Several health care providers and performance specialists at the unit initiated a plan to address these issues. This plan was coined 3BP which stands for Brain – Body – Balance Plan. It can be viewed as a play on words in that the program is developed to address the cognitive difficulties (brain), body (vision, cervical disorders, upper quadrant disorders, etc.) and the ever-challenging lack of balance brought on by the mTBI-like symptoms. One can also view it as the balance required between the body and the brain for optimal performance.

This presentation will describe current repetitive sub concussive exposure (RSCE) screening and mitigation strategies; 3BP is a holistic approach to a complex problem which consists of 4 main lines of effort; Prevention and tracking, Intervention, Performance optimization and Research.

Patient Population: Special Operations Forces operators and Canadian Armed Forces members at risk of repetitive sub concussive injuries

Results: The results of the RSCE screening program (2016-17) were

concerning regarding the possibility in which our SOF members were potentially sustaining mTBI symptoms from repeated exposure to low level blasts and firing of high caliber rifles.

Blast exposure monitoring sensors have been in use at CANSOFCOM since 2012 to quantify blast overpressure exposure in uncontrolled environments. The blast gauge system provides users with valuable information such as blast event Peak Overpressure (in PSI), Impulse (PSI * msec), and Peak Acceleration (G), which can help members better understand their exposure level.

Conclusions: The Canadian Special Operation Forces Command (CANSOFCOM) continues to investigate symptoms thought to be linked to repetitive low level blast and repeated firing of high caliber weapons. Baseline testing and different screening and mitigation mechanisms are now in place through the Brain Body Balance Plan. 3BP plays a fundamental role in the early recognition and treatment of signs and symptoms linked to repetitive sub concussive exposure.

5C02: Self-Rated Health and Chronic Health Issues Among Regular Force Personnel: Findings from the 2019 Canadian Armed Forces Health Survey

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Introduction: The Canadian Armed Forces Health Survey (CAFHS) is a population-based health survey that provides a snapshot of the overall health status of Canadian Armed Forces personnel. The primary purpose of this study was to examine the relationship between chronic health conditions and self-rated physical and mental health in active Regular Force personnel.

Methods: The CAFHS was administered by Statistics Canada in collaboration with the Directorate of Force Health Protection of the Canadian Forces Health Services Headquarters. Data collection occurred over a six-month period from January to June 2019. Results were weighted to the 2019 Regular Force population distribution and analyzed to produce stratified frequencies in the form of descriptive tables and figures. Logistic regression was used to determine the relationship between chronic health conditions and poor self-rated physical and mental health.

Results: Overall, the odds of reporting at least one chronic health condition increased as self-rated physical health and/or mental health decreased. And Regular Force personnel with poor self-rated physical and/or mental health were 6.0 (95%CI 5.0, 7.3) and 5.1 (95%CI 4.0, 6.6) times more likely to report at least one chronic health issue when compared to personnel with excellent self-rated physical and/or mental health, respectively.

Poor physical health was most strongly associated with diabetes, intestinal/stomach ulcers, sleep apnea, high blood pressure, and back problems while poor mental health was most strongly associated with intestinal/stomach ulcers, sleep apnea, migraines, and hearing problems.

Additionally, for some chronic conditions (such as diabetes) there was a substantial negative relationship with mental health but a slight negative relationship with physical health, whereas for other chronic conditions (such as asthma) the relationships with physical and mental health were similar.

Conclusions: The majority of Regular Force respondents reported good to excellent health. Personnel with poorer self-rated physical and/or mental health were at an increased odds of reporting at least one chronic health issue. The findings present an opportunity to raise awareness of these associations and strengthen support for mental and physical health, health promotion, and prevention of chronic diseases. When designing interventions, some chronic diseases may warrant more mental health support than others.

6A01: Taxing the Rich: Examining the effects of repetitive low-level occupational blast exposure on the rich-club brain network in military operators

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¹Defence Research and Development Canada; ²Canadian Forces Health Services

Introduction: Military operators are regularly exposed to repetitive low-level blast (LLB) in training and operations. While the cumulative effects of LLB exposure are believed to be harmful, much remains to be learned about their impact on the brain. The rich-club network is comprised of brain regions (referred to as nodes) that are densely connected to the rest of the brain and facilitate various functions. Research has found that brain injury paradoxically leads to enhanced network connectivity over the short term which is an adaptive response known as hyperconnectivity. However, chronic hyperconnectivity can be detrimental to brain health. Thus, we aimed to determine whether the rich-club network was altered following LLB exposure. We hypothesized that operators exposed to repetitive LLB would exhibit hyperconnectivity relative to those without LLB exposure.

Methods: Experienced Canadian Armed Forces (CAF) operators were recruited for an ongoing study to examine the effects of repetitive LLB exposure. Participants underwent a resting state functional magnetic resonance imaging (rs-fMRI) scan at two time points, before and after a training course. Age- and sex-matched CAF controls without a history of blast

exposure also completed two rs-fMRI scans spaced one month apart. We analyzed the rs-fMRI data using graph theory, which is an emerging analysis technique to study brain network characteristics.

Expected Results: Thirty-one operators and twenty-three controls were included in the preliminary analysis. No significant differences were observed in the global properties of the rich-club network in operators or controls across both time points. However, local analysis of network nodes yielded a reduction in the local efficiency (i.e., how efficiently a node exchanges information with its neighbours) and clustering coefficient (i.e., proportion of connections a node has with its neighbours) in the right superior parietal cortex of the rich-club network in operators after they completed their course compared to baseline (false discovery rate [FDR]-adjusted p -value = 0.03). Controls showed no significant differences in node properties between scans.

Conclusions: These preliminary results demonstrate that relatively acute exposure to repetitive LLB may alter the local properties of brain networks. Contrary to our hypothesis, we observed reduced functional connectivity in the rich-club network following LLB exposure. Importantly, these findings involving connectivity loss must be interpreted in light of prior occupational history, given that the experienced operators had been exposed to an accumulation of LLB over their careers before training. Collectively, these results add to the growing body of evidence involving the impact of repetitive LLB exposure on neurological health.

6A02: Canadian Armed Forces Personnel and Veterans with Repetitive Occupational Blast Exposure Present with Dysregulated Neural Activity and Altered Brain Communication: An ongoing pilot study

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Introduction: Blast-induced subconcussive neurotrauma can present with neurological impairment, neuropsychiatric challenges, and neurocognitive sequelae. Increasingly it is recognized that repetitive exposure to low-level subconcussive overpressure from blast waves presents a serious health risk for military members, and especially operators. This group can exhibit neurocognitive and mental health symptomatology consistent with cumulative subconcussive neurotrauma. In this pilot study, we assessed mental health and functioning of neural circuits and brain communication in a group of CAF personnel, with and without occupational exposure to repetitive low-level blast.

Methods: We captured mental health status using measures of depression (PHQ9), anxiety (GAD7), PTSD (PCL), and concussion symptoms (SCAT2 symptom evaluation) and acquired brain imaging data with magnetic resonance imaging (MRI) and magnetoencephalography (MEG) resting state. We recruited 37 participants – 20 with a history of repetitive occupational blast exposure (n=16 analysed to date), and 16 age- and sex-matched CAF controls without a history of repetitive blast exposure. We examined the patterns of neural firing - rapid, transient events of dynamic neural activation that subserve cognition, behaviour, and mood – as well as brain communication and connectivity.

Expected Results: Our preliminary results reveal similar levels of anxiety, depression and PTSD symptoms in blast-exposed members compared to controls, but with a significantly greater number of mild brain injury symptoms, and a trend for greater overall severity. In the occupational blast group, we observed a trend towards pathological ‘slowing’ of neural activity, including elevated ‘delta’ activity – consistent with demyelination – in right ventrolateral prefrontal cortex. We also observed significant changes in transient neural ‘bursts’, which reflect thalamo-cortical circuit integrity. Moreover, we found patterns of altered brain communication, including both functional hyper- and hypo-connectivity, across multiple brain areas. Importantly, altered gamma connectivity - particularly within the Default Mode Network, a brain circuit in which dysfunction has been related to numerous psychiatric and neurological challenges - points to changes in the balance of synaptic excitability and inhibition.

Conclusions: These findings suggest that military operators exposed to subconcussive blast overpressure exhibit elevated symptoms of brain injury/dysfunction, as well as dysregulated neural activity and cortical communication. These neural signatures provide prime targets for neurostimulation that promote neuroplasticity and repair, as well as synaptic targets for ‘psychoplastogens’ which potentiate synaptogenesis and reduce neuroinflammation. These results, along with those from an ongoing investigation in civilians, indicate that brain scans could be used to longitudinally track brain health in those vulnerable to repetitive subconcussive neurotrauma, including operators and athletes.

6A03: Central and Peripheral Measures of Tauopathy in Canadian Armed Forces Members with Repetitive Exposure to Low-intensity Occupational Blast

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Introduction: Repetitive occupational blast overpressure (i.e., breaching charges, high caliber weapons systems) during training and operations of military members raise concern over cumulative harmful effects to the brain. Evidence links repeated exposure to low-intensity (subconcussive) blast with poor health outcomes, along with progressive neurodegenerative processes that may develop during or after military service. Chronic traumatic encephalopathy (CTE; a neurodegenerative disorder resulting from repeated head trauma) is suspected to occur as a result of chronic exposure to blast waves and is associated with memory loss, cognitive impairment, and mood changes. Deposition of hyperphosphorylated-tau (p-tau) in neurons, astrocytes, and cell processes around small blood vessels and aggregation of neurofibrillary tangles (tauopathy) are key neuropathological features of CTE. However, CTE diagnosis is restricted to post-mortem brain tissue examination and the mechanisms underlying this pathogenic pathway remain unclear. Although experimental models link repeated blast with persistent neurological effects, brain tau aggregation and elevations of circulating tau isoforms; studies investigating central and peripheral measures of tau in humans exposed to blast are limited. This study evaluates positron emission tomography (PET) imaging of [18F]flortaucipir and ultrasensitive Single MOlecule Array (SIMOA™) immunoassay technologies to detect in vivo brain and blood levels of tau proteins, respectively.

Methods: Twenty four Canadian Armed Forces (CAF) members (male; 43.8 ± 6.1 yr) with extensive occupational blast exposure completed a PET scan with injection of [18F]flortaucipir, a novel radioligand targeting brain tau. A magnetic resonance image was acquired for delineation of brain regions of interest (ROIs). Standardized Uptake Value ratios (SUVr) were calculated with cerebellum as reference tissue. Plasma concentrations of Total-tau (T-tau), P-tau181, and Amyloid-beta(Aβ)42 were quantitated using Quanterix-SIMOA™.

Expected Results: [18F]flortaucipir uptake was highest in midbrain/substantia nigra (SUVr range:0.9–1.7) basal ganglia (putamen and pallidum SUVr:0.8–1.7) temporal (SUVr:0.7–1.1) and frontal cortices (SUVr:0.6–1.12). [18F]flortaucipir SUVr values (in 7 brain ROIs, including temporal and frontal cortices) were positively correlated to years of breaching (r=0.9; p<0.05). Potential relationships between central [18F]flortaucipir values and peripheral neurodegenerative biomarker levels will be assessed.

Conclusions: Consistent with previous experimental PET studies, describing tau deposition in association with dose-dependent exposure to blast, our study found a positive relationship between repeated blast exposure and brain tau deposition, further suggesting cumulative exposure to subconcussive neurotrauma may be linked to risk of tauopathy. Ongoing assessments of peripheral tau will help establish the long-term pathobiological significance and better determine

what constitutes safe exposure limits to occupational blast in CAF operators.

6A05: Machine Learning, Neuroimaging, and Multi-OMIC Data Lead to Effective Characterization, Modelling and Patient Endosubtype Discovery Across the Spectrum of Brain Health

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Introduction: Head trauma – including symptomatic concussions, mild traumatic brain injuries, or repeated subconcussive impacts – may cause serious neurological dysfunction, known to result in a range of metabolic, microstructural, and behavioral effects, potentially leading to a reduced quality of life. In a military context, repetitive exposure to low-intensity occupational blast is a serious concern for the health and performance of CAF members. Emerging neuroimaging and molecular studies show promise in biomarker discovery, mechanistic exploration and translational applications. Leveraging structural and functional brain connectivity maps (or ‘connectomes’) and molecular OMICS datasets with machine learning (ML), we present recent findings aiming for a comprehensive neuro-molecular characterization of brain health and dysfunction, signature discovery, modelling and endophenotyping.

Methods: Functional (Magnetoencephalography - MEG, across seven ‘brain wave’ frequencies; Functional Magnetic Resonance Imaging - fMRI) and structural (Diffusion tensor imaging - DTI) connectome data were used from 26 mild traumatic brain injury (mTBI) and 24 control subjects. We will also assess the transcriptomic and epigenomic profiles of CAF members with extensive exposure to occupational low-intensity blast. Comprehensive ML strategies were developed for single-modal and multimodal analysis. Supervised feature selection and classification modelling identified the most important functional and structural brain connections linked to neurotrauma. These features also supported predictive ML models for each neuroimaging modality. Further, supervised data fusion and unsupervised network/clustering analysis were applied to evaluate case vs control separation performance. In addition, unsupervised subject similarity fusion and clustering analysis identified patient endophenotype groups.

Expected Results: Functional connectivity modalities (fMRI and MEG) exhibited better performance in ML classification than the sole structural (DTI) connectivity modality. Subject fusion maps integrating all three neuroimaging modalities (DTI+fMRI+MEG) exhibited perfect unsupervised group

separation. Further, subject similarity network analysis led to patient level similarity networks, identifying patient groups with similar integrated brain connectivity profiles. Additionally, supervised ML feature selection method will be able to identify molecular OMICS targets differentiating subconcussive neurotrauma and control cohorts.

Conclusions: We demonstrate that functional connectomes show the best performance for classifying brain injuries; and cross-modal fusion with structural connectivity data were the most effective in distinguishing the mTBI phenotype. With subject similarity network analysis, endosubtype identification was possible with these datasets. Collectively, state-of-the-art neuroimaging, multi-OMICS and ML techniques provide valuable insight into how mTBI affects neuro-/molecular mechanisms by allowing for phenotypic modelling. These advances have the potential to lead to improved clinical practice, better management of brain health and injury, personalized medicine and recovery tracking.

6A06: Immunoassay Technologies and Statistical Approaches for the Use of Neuroinjury and Inflammatory Biomarkers for Brain Injury Research – Evidence from military and civilian cohorts

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Introduction: Military and athletic populations are at risk for acute and chronic brain injuries including concussion, mild traumatic brain injury (mTBI), and repetitive subconcussive impacts. These conditions can present with a varied and broad range of symptomologies, making clinical decisions difficult. Furthermore, repetitive mild brain trauma may have long term negative health consequences by contributing to chronic neurodegenerative disorders such as dementia and Chronic Traumatic Encephalopathy. Understanding the immediate and long-term neuropathology of secondary injury is crucial for the development of appropriate treatment strategies. Progress in biofluid-based proteomic biomarker assay technologies will undoubtedly improve our ability to elucidate (neuro) inflammatory pathogenesis and aid in clinical decision-making following brain trauma, although an increase in the breadth of data generated must be met by an increase in statistical and scientific rigor.

Methods: Peripheral blood samples collected from Canadian Armed Forces (CAF) members (n=30), civilian athletes with a history of (sub)concussive head trauma (n=30), and matched healthy controls (n=30), were assessed for an array of immuno-inflammatory and neurological biomarkers: cytokines/chemokines/receptors [interleukin (IL)-1 β , -2, -4, -6, -10, -12, -13, -15, -16, -17, interferon (IFN)- γ , IL-1 receptor

antagonist (IL-1RA), IL-6 receptor, tumor necrosis factor (TNF)- α/β , TNF receptors (TNFR)-I/II], monocyte chemoattractant proteins (MCP)-1,-4, macrophage-derived chemokine (MDC), macrophage inflammatory proteins (MIP)-1 α/β]; neuronal damage [neuron-specific enolase (NSE), ubiquitin carboxy-terminal hydrolase (UCH)-L1]; axonal injury [neurofilaments light/heavy (NF-L/H)]; astroglial damage [S100B, glial fibrillary acidic protein (GFAP)]; and neurodegeneration [Total and Phosphorylated-Tau (T-/P-Tau)] using advanced immunoassay platforms, including ELLA (ProteinSimple[®]) multianalyte Simple-Plex cartridges, MesoScale Discovery (MSD) MULTIARRAY plates, O-link Proximity Extension Assay (PEA), and Quanterix Single MOleculE Array (SIMOA) technologies.

Expected Results: In comparison to conventional plate-based systems, novel immunoassay technologies provide greater sensitivity/specificity across a broad dynamic-range for most analytes. Emerging findings from head-injured military personnel and concussed athletes – both in unstimulated plasma and immunogen-activated tissue culture supernatants – will be discussed in terms of their comparative performance, clinical utility and analytical and statistical challenges. Furthermore, pre-analytical challenges, and prospects and pitfalls for translation of the spectrum of neurological biomarkers for clinical diagnosis and prognosis will be discussed.

Conclusions: Significant scientific advances continue to accelerate our understanding of the complex and heterogeneous pathophysiological processes associated with brain trauma. As new technologies allow for the generation of greater amounts of biological data per sample, more meaningful discoveries with true clinical impact are possible. However, success in these endeavors is entirely dependent upon scientific and statistical approaches that value reproducibility, (pre)analytical considerations, and go beyond conventional null hypothesis significance testing.

6B01: Military Health and Well-being Surveys on COVID-19: Lessons across Five Nations

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Introduction: In March 2020, the world faced a unique challenge as the COVID-19 pandemic threatened the health and functioning of communities globally. In order to document the impact of this context on service members and their family, and rapidly provide military leaders with relevant data, members of an international technical panel on resilience in the military shared lessons learned in developing surveys on

COVID-19, mental health and well-being. This panel, a part of The Technical Cooperation Program (TTCP), is comprised of representatives from five nations (Australia, Canada, New Zealand, the UK and the US). Despite substantial national differences in the pandemic experience, each of the five nations were able to conduct a survey of their military personnel. Methods, questions, and findings were then shared.

Methods: Surveys were developed and administered to service members in Australia, Canada, New Zealand, the UK, and the US. Surveys had a common set of questions, which provided a unique opportunity to conduct parallel analyses and compare responses across nations to generate a set of shared lessons learned.

Results: This collaborative approach demonstrated the value of information sharing both in terms of survey design and lessons learnt. Results also enabled the identification of common predictors of health outcomes reported by service members, such as financial stressors, leadership, and family stress.

Conclusions: This collaboration has supported the rapid dissemination of information to military leaders in each nation. International collaborations can also be critical in identifying unique differences across militaries, and provide insight into the various phases of the pandemic. Lessons learnt from this cooperative approach were identified, including the importance of (1) having a technical panel pre-positioned to respond quickly, (2) sharing of methods and metrics, (3) identifying potential moderators of military health and well-being, and (4) understanding unique facets of each national experience. On many levels, the COVID-19 pandemic has underscored the need for international cooperation, and the COVID-19 surveys demonstrate how service member health and well-being can also benefit from a cooperative international response.

Poster Presentations

P114: Comparison of a Computerized Eye Tracking system to Bedside Vestibular/Ocular-motor Screening for Repetitive Sub-concussive Exposure

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Introduction: Up to 2 million of traumatic brain injuries of various severity occur annually in North America which impacts more than 15,000 military members specifically per year. Similar to mild traumatic brain injury (mTBI) the consequences of military exposure to blast overpressure includes acute and chronic neurological injury and symptomatology. Despite not consistently meeting the strict criteria for traditional

concussions, there is emerging evidence that these sub threshold forces can lead to repetitive sub concussive injury (RSCI). Consensus guidelines have advocated for a multifaceted assessment to include patient reported outcomes, clinical examination, neurocognitive and motor control testing. The Vestibular/Ocular-motor Screening (VOMS) has been demonstrated to have good reliability and validity in identifying patients with related deficits in mTBI, but traditional and digital testing tools require further validation in RSCI.

Methods: Investigators compared traditional VOMS to digital visual eye movement for screening of RSCI in a special forces population, previously exposed to repeat sub-concussive forces, to controls. The commercial RightEye Eye QTM software used is a digital assessment for eye movements, similar to the VOMS, measuring tracking, stability, reactions times, visual speed. Analysis will determine if traditional and/or digital assessments will correlate with symptomology, and if digital evaluations provide greater objectivity and validity for RSCI. Measures will be tested for normal distribution, variance, corrected for multiple comparisons, while correlating variables of interest.

Participants data collection included 9 snipers and 9 breachers, and 7 controls.

Expected Results: Statistical analysis will evaluate for differences between operators and controls with respect to patient reported outcomes (PRO), VOMS total and subscale scores and digital visual testing (DVT).

Conclusions: The results of this pilot trial may help determine relative utility of PRO, VOMS and DVT for predicting vestibular ocular deficits after RSCE and correlating this with symptomology. This could help guide the necessity, frequency and type of screening for military members exposed to sub concussive forces. Ideally this information will provide tools for early and efficient identification of at risk members, reduce the risk of chronicity, improve clinical prognostication and treatment selection, while laying the foundation for future research.

P127: Serving Through the Perimenopause: Experiences of women in the United Kingdom Armed Forces

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Brief Description: The perimenopause (PMP) is 'the period of time in which the first endocrine, biological and clinical features of approaching menopause begin, up through one year after the final menstrual period'. With increasing numbers of women serving in the UK Armed Forces and better retention of women into their 40s and 50s, it is inevitable that serving women are being affected by the perimenopause yet

there is no information about the numbers affected or their experiences serving through it. This survey aimed to gather information on the experiences of PMP symptoms and their access to and care received from Defence Primary Health Care (DPHC) in the UK.

Patient Population: An anonymous online survey, including the Greene Climacteric Score (GCS), was distributed through official Defence communication and networks to women aged 40 and over. Quantitative data was used to calculate descriptive statistics. Qualitative data from free text responses was anonymised, extracted, and imported into Nvivo for analysis. An iterative thematic analysis was undertaken.

Results: There were 607 responses from a potential population of c.2750 (22%). The response rate varied by age group with a 36% response rate from those over 50. Most believed they were perimenopausal (81%) but only 26% of these were on any treatment. The median GCS was 24/60, with psychological function the worst domain affected. A moderate correlation existed between homelife (Pearson $r=0.541$, $P<0.001$) and work productivity ($r=0.508$, $P<0.001$), and the total GCS. Over half of the respondents felt that PMP healthcare provision within DPHC could be improved.

Qualitative analysis identified seven themes; accessing healthcare, coping in the workplace; fearing the effect on careers, primary care management of the perimenopause, the physical effects, the psychological and cognitive effects, and the impact on the respondent's ability to do exercise.

Conclusions: This survey showed respondents were living through a symptomatic perimenopause whilst trying to manage a career in a male-dominated environment perceived to be unsympathetic to their experiences. Aspects of a military life, such as uniforms and fitness testing, exacerbated the PMP for many. Emotive comments highlighted women in the process of leaving the Armed Forces and turning down promotions because they felt their symptoms limited their function within the military environment. This survey identified that a formal health needs analysis is required, and further work done to raise awareness of the PMP to line managers, primary care commissioners and Command.

P131: Military and Veteran Friendly Campus Toolkit: Perspectives of military members, Veterans, Families and post-secondary staff

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Introduction: Many Military Members attend post-secondary education (PSE) either throughout their career or once

released from the military. For the last number of years, Military Members and Veterans (MMVs) who are students have been financially supported through various Canadian Armed Forces (CAF) programs, the Veterans Affairs Canada (VAC) Education and Training Benefit, and Rehabilitation Services and Vocational Assistance Programs. Despite the availability of financial assistance, however, many barriers to attending PSE remain. One third of Veterans who are students experienced loneliness, low social support, and psychological stress that impacted their ability to engage in PSE. MMV students experienced significantly less satisfaction with their student-faculty interactions, fewer opportunities for integrative learning and less campus support than non-MMV peers (Klaw et al., 2021). Evidence has shown that Military and Veteran-Friendly Campuses (MVFCs) play an important role in supporting MMVs to successfully complete PSE. Yet, the gap remains as to how these services may be operationalized in post-secondary institutions in Canada and what the current perspectives on needs and supports are from MMVs, family, staff and external providers..

Objectives

To understand the:

1. Needs of MMVs pursuing PSE as well as strengths MMVs bring to PSE and civilian communities.
2. MMV process of engaging in PSE.
3. Family perspectives and support available as MMVs engage in PSE.

Methods: Individual semi-structured interviews and focus groups with MMV students and Alumni, MMV families, staff and faculty in post-secondary institutions and external providers were recorded via zoom. The process was iterative with analysis and interviews occurring synchronously. All interview transcripts were analyzed using both a deductive approach based on the VAC well-being domains and data-driven inductive thematic analysis (Braun & Clarke, 2006).

Expected Results: Twelve semi-structured interviews and focus groups were conducted with 10 MMVs, 3 family members, 10 faculty and staff members, and 3 external stakeholders. Preliminary themes include: (1) tension between military and academic cultures, (2) difficulties communicating between post-secondary institution, CAF and VAC, (3) a need for career facilitation and educational pathways, (4) recognition of MMVs transferable skills by post-secondary institutions, (5) accommodation for mental/physical health needs, and (6) physical space and navigation needs for MMVs in PSE.

Conclusions: The results of this study support the need for the development of an MVFC Framework and Toolkit that provides wrap-around services without duplication of current services offered by CAF and VAC. The MVFC Framework and Toolkit can

be used as a roadmap for other postsecondary institutions.

P132: Application of a Standardized Whole-blood Stimulation Assay and Automated Microfluidic Immunoassay System for Immune Response Profiling in Military Mental Health Research

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Introduction: Mental health conditions represent complex phenotypes with imprecise diagnostic boundaries. Shifting the paradigm of understanding this complexity from clinical assessment to biological function is a goal of studies investigating the pathophysiology of mental disorders. Characterizing immuno-inflammatory alterations hold promise for understanding psychiatric disease etiopathology, treatment strategies, and clinical outcomes. Neuropsychiatric disorders, such as depression and PTSD, are characterized by inflammatory alterations, including elevated peripheral cytokine/chemokine levels. Investigation of the immuno-inflammatory response in psychiatric disturbance is, however, limited by challenges in deriving reliable information on immunological function. Standard immuno-monitoring tools rely on analysis of endogenous mediators in peripheral biofluids. Such methods are constrained to providing a static 'snapshot' of low-level inflammatory responses; this limits ability to derive mechanistic insights and narrows scope of investigation to constitutively-expressed high-abundance molecules. We evaluated an integrated whole-blood collection and culture system, in tandem with an automated microfluidic immunoassay platform to generate reproducible immunological data.

Methods: Blood samples were collected from CAF volunteers (aged ≤65yr); TruCulture (TC) stimulation was used to assess de novo synthesis of soluble immune mediators released into supernatant upon ex vivo activation. This syringe-based system encompasses multiple pre-loaded immunogens that elicit immune responses following short-term stimulation of unfractionated whole-blood, preserving physiological cellular interactions. TC assay tubes included lipopolysaccharide (LPS) and staphylococcal enterotoxin-B (SEB), which elicit innate and adaptive immune responses, respectively. A third TC tube without immunogen served as unstimulated control. Circulating concentrations of 16 inflammatory mediators [tumor necrosis factor alpha (TNF)-α, interferon gamma (IFN)-γ, interleukins (IL)-1b,-1ra,-2,-2RA,-4,-6,-7,-10,-12p70,-13,-15,-17A, and chemokines (CCLs)-2,-4] were quantified using Simple-Plex™ multianalyte cartridges on Ella® immunoassay platform.

Expected Results: Our results demonstrate LPS and LPS+SEB stimulated samples exhibit robust ex-vivo activation of innate and adaptive immune cells. Significant increases in

15-of-16 measured cytokines/chemokines were seen with both stimulants; IL-2RA decreased following stimulation. The greatest increase was seen in IL-6, IL-1b and IFN-g. While LPS and LPS+SEB caused similar increases in most markers, cytokines associated with adaptive immunity (IFN-g, IL-2, IL-17A) were higher with LPS+SEB.

Conclusions: TruCulture functional immune stimulation with Ella immunoassay provides a reliable, simple-to-use and highly

effective tool for cytokine profiling in military health research. This system can accurately monitor host immunoreactivity and offers valuable insight into the pathophysiology of inflammatory-mediated disorders. This technology may be applied to diagnosis and assessment of therapeutic responses, which could aid in clinical decision-making regarding initiation, cessation, escalation or change of treatment, thus informing more targeted interventions focused on optimizing individualized host response to operational stressors/trauma.

VETERANS / VÉTÉRAN(E)S

HEALTH POLICY

Poster Presentations

P161: The Gordian Knot of Suicide: A review of ecological and military/veteran clinical literature

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Introduction: When Alexander marched into Phrygia, he was presented with a ball of knots to unravel from the yoke of the chariot of King Gordius and thus fulfilling a prophecy to become the rightful ruler of Phrygia. Alexander solved the Gordian Knot by either slicing it, or simply removing the lynchpin and sliding the yoke out of the knot. He defeated the knot by ignoring it and addressing the yoke bound by the knot. In the same way, we ask the following question: *What if the best way to prevent suicide is to not look at suicide?*

The Gordian Knot of suicide is the complex interplay of clinical and contextual factors (the socio-ecological context) that bind and contribute to crises and—in some cases—suicidal thoughts and behaviors (STB) or other potentially harmful behaviors leading to premature death. This Gordian Knot has typically drawn the eyes of researchers towards a simplistic focus on either clinical factors or societal issues related to suicide, ignoring the complex relationship between each.

Methods: This literature review builds on Milner et al.'s (2013) review of social and economic risks for suicide mortality that used classical Durkheimian search terms. We also took a deep dive into the literature surrounding military/veteran suicide, exploring the up-to-date literature on contextual factors in line with Milner et al. (2013) and then pivoting to the military/veteran literature.

Results: Our review found researchers continue to round up the usual suspects. Very little was new. Much of the research on military/veteran suicide and mental health remains clinically focused, even though clinical “risk” factors have produced little to no valid prediction or prevention models (Franklin et al., 2017). We offer a synopsis of emerging literature on the role military/veteran identity as a critical aspect of military-to-civilian transition and a growing research interest in understanding how the military shapes identity development and of the role of identity and well-being on suicide risk.

Conclusions: The enduring characteristics of military identity may be contributing to post-service strain, a loss of purpose, existential isolation, and a crisis of identity for those attempting to adapt to civilian life. There is a need to go deeper into the socio-ecological context of behaviors that contribute to suicide and other premature mortality. Focusing strictly clinical or

contextual “risk” factors will continue fail our veterans.

HEALTH SERVICES

Podium Presentations

4D04: Understanding the Unique Needs of Canadian Armed Forces Veterans Living with Chronic Pain: A systematic review

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Introduction: Canadian Armed Forces (CAF) Veterans come from a unique military culture and experience chronic pain at a higher rate than the Canadian general population. After release from the military, Veterans access health services through civilian healthcare providers in provincial public health systems who may be unfamiliar with their military background and the associated cultural and health needs. The purpose of our research is to: 1. synthesize evidence on civilian healthcare providers military knowledge, cultural competence, and gaps in knowledge; and 2. synthesize evidence on knowledge translation approaches aimed at improving military knowledge and cultural competence among civilian healthcare providers.

Methods: A mixed methods systematic review using Johanna Briggs Institute methodology will be conducted. Primary research (trials, observational, cohort, cross-sectional, qualitative, and mixed methods studies) that evaluate the knowledge needs of civilian healthcare providers and/or knowledge translation/educational approaches for improving military knowledge among healthcare providers will be included. A health sciences librarian will be consulted in the design of the search strategy, which will be implemented in multiple healthcare databases (e.g., Medline, EmBase, CINAHL) and grey literature sources (e.g., government websites) to identify eligible articles. Reference lists of eligible articles will also be screened. Four reviewers will screen titles and abstracts and select articles for full text review. A narrative description of key findings will be reported.

Expected Results: Data analysis and synthesis will result in a narrative description of the civilian healthcare providers' military knowledge and cultural competence, including how providers come to build this cultural competence. We will also provide recommendations, based on our findings, around what civilian healthcare providers need to know and do to provide effective service to Veterans. These results will contribute to the development of guidelines for civilian healthcare providers working with Veterans who have chronic pain.

Conclusions: Our findings will synthesize the evidence on civilian healthcare providers' military and Veteran knowledge and cultural competency. The evidence will help to identify areas for future research and health professional education to help prepare civilian healthcare providers to meet the unique needs of Veterans with chronic pain.

5C04: Transition Needs among Veterans who Live with Chronic Pain: A systematic review

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Introduction: A third of Canadian Armed Forces veterans report difficulty adjusting to post military life including difficulties related to employment, finances, interpersonal relationship problems, physical and mental health, housing, access to support services, and identity challenges. Approximately 40% of Canadian veterans report living with chronic pain, which is likely to be associated with greater needs during transition from military to civilian life. Accordingly, assessing the need for specific support to facilitate successful transition is essential. This systematic review aims to identify transition needs among military personnel living with chronic pain as they transition from military service.

Methods: A systematic search of observational studies was conducted on December 3, 2021 in MEDLINE, EMBASE, CINAHL, Scopus, and Web of Science, retrieving 2,144 potentially eligible articles. The search used the following key terms: veterans and chronic pain. Titles/abstracts, and subsequently, full-texts were screened independently and in-duplicates. Observational studies that explore transition needs among military veterans who live with chronic pain at the time of release from the military were eligible for inclusion. Reviewers, working independently and in duplicate, used a standardized and pilot tested data collection form, to extract data from all included studies. Data on the challenges experienced by and the needs of veterans transitioning into civilian life was extracted, and a thematic analysis was completed to identify patterns and integrate findings from multiple primary studies.

Expected Results: Of the 2,144 unique citations identified, 46 were included for full text review and seven eligible studies were included. Studies included 37,438 veterans living with chronic cancer or non-cancer pain and included a mean of 5,248 participants who are 85% male (SD=3.85) and are aged 49 years old (SD=6.18). Most studies were conducted in the United States and focused on the experiences of U.S. Veterans Affairs military transitioning to civilian life (6/7) with the exception of one study of Canadian Armed Forces veterans. We anticipate results from thematic analysis will be completed by May 2022.

Conclusions: This systematic review will provide evidence for supporting military members living with chronic pain as they adjust to the transition from military service. The results will add to continuous efforts of the Chronic Pain Centre of Excellence for Canadian Veterans to prioritize supporting veteran health and well-being by answering important research questions. Our findings will also identify gaps in our knowledge and can catalyze future research endeavors.

6E02: Differences in Mental Health Service use between Canadian Armed Forces Members and Veterans: Data from the 2018 CAF Members and Veterans Mental Health Follow-Up Survey

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Introduction: Military careers carry unique occupational risks, including exposure to psychologically distressing events, which may increase the prevalence of mental health disorders among Canadian Armed Forces (CAF) members and Veterans compared to the general Canadian population. Previous research has aimed to quantify patterns and predictors of mental health services use (MHSU) among Canadian military and Veteran populations; however, there is little evidence about whether factors associated with MHSU differ between active CAF members and Veterans.

Objectives: This study aims to describe differences in MHSU by comparing a sample of Veterans who left the CAF between 2002 and 2018 to a group of CAF members who were employed within the CAF in both 2002 and 2018. The specific objectives of this manuscript are to: 1) compare prevalence of past 12-month MHSU (defined as ≥ 1 visit with a psychiatrist, family doctor, other medical doctor, psychologist, nurse, or social worker) between CAF members and Veterans; and 2) identify sociodemographic, military-, trauma- and health-related variables associated with past 12-month MHSU among CAF members and Veterans.

Methods: The current study uses data from the 2018 CAF Members and Veterans Mental Health Follow-Up Survey (CAFVMHS), which is a follow-up survey of current and former members of the CAF who participated in the 2002 Canadian Community Health Study – Canadian Forces Supplement (CCHS-CFS). Sociodemographic, military-, trauma-, and mental health-related variables were selected a priori, and their respective associations with MHSU among 1) CAF members and 2) Veterans were estimated using multiple logistic regression models.

Results: Among both the CAF member and Veteran subsamples, meeting criteria for at least one past 12-month mental health disorder (posttraumatic stress disorder, major depressive episode, generalized anxiety disorder, panic disorder, and/or social phobia) was strongly associated with past 12-month MHSU [CAF members: AOR = 7.80 (95% CI: 7.18 - 8.46); Veterans: 11.82 (95% CI: 11.07 - 12.61)]. Past 12-month suicide ideation, history of sexual trauma, and history of adverse childhood experiences were also significantly associated with MHSU among both subsamples. Deployment outside of Canada, age, sex, and education level were associated with MHSU among Veterans, but not active personnel.

Conclusions: As anticipated, the presence of a past 12-month mental health disorder was associated more strongly with MHSU than any of the other variables considered. Some differences in variables associated with MHSU between CAF and Veteran subsamples were observed; potential reasons for these differences and their implications will be discussed.

6E03: Investigating the Association between Military Length of Service and Rate of Emergency Department Visits Following Release

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Introduction: There is limited information available on Canadian Armed Forces (CAF) Veterans use of EDs following the military-to-civilian transition, relative to non-Veterans. This information could provide insight into unmet primary healthcare needs, signals of mental health crises, and support policy and program development. Our aim was to compare rates of ED visits between Veterans and non-Veterans and examine heterogeneity in rates by sex and length of service.

Methods: This was a retrospective, matched cohort study of Ontario CAF and RCMP Veterans and Non-Veterans, using encrypted, linked administrative databases housed at ICES. Veterans residing in Ontario who released between 1998 and 2020 were matched on age, sex, income, and residence to four non-Veterans, selected from a population most likely to be working during the Veterans' military service. ED visits were measured from index to March 31, 2020. We calculated crude and adjusted relative rates using Andersen-Gill recurrent event regression models comparing Veterans and non-Veterans. Effect modification by sex and by length of military service was investigated.

Results: The crude ED visit rates of Veterans and matched civilian comparators were 3.20 (95% CI, 3.18-3.23) and 3.15 (95% CI, 3.13-3.16) per 10 person-years, respectively, with a crude relative rate of 1.02 (95% CI, 0.90-1.16). The adjusted relative rate was 0.96 (95% CI, 0.93-0.98). The interaction between sex and

Veteran status was significant. Among males, the adjusted ED visit rate for Veterans was significantly lower than non-Veterans (HR 0.95, 95%CI 0.92-0.97), while the adjusted ED visit rate was similar for female Veterans and non-Veterans (HR 1.01, 95%CI 0.92-1.11). Length of service was inversely associated with ED visitation rate; compared to matched non-Veterans, the relative adjusted ED visit rate of Veterans decreased with increasing length of service. For example, Veterans who served for less than 5 years had a significantly higher ED visit rate than non-Veterans (HR 1.17 (95% CI 1.09-1.26), while Veterans who served for ≥ 30 years had a significantly lower ED visit rate than non-Veterans (HR 0.78, 95%CI 0.75-0.82).

Conclusions: The association between ED visit rates for Veterans and non-Veterans varied by sex and length of service. This could signal differences in underlying acute health needs or access to the health care system following release, both in the short- and long-term. Understanding what these different patterns mean for designing health services and programs for female Veterans and for those serving shorter durations is needed to ensure relevant and timely support for optimal post-transition health is provided.

6E05: Measuring health in veterans: a systematic review of instruments and their measurement properties

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Introduction: The ability to reliably measure health is essential to assess veterans' needs and the effects of interventions, policies, programs, and services directed at improving veterans' quality of life. We conducted a systematic review to identify instruments that measure subjective health status in veterans. We anticipated that there would be few instruments targeted for veterans and that instruments for community populations may be applicable to veterans. Hence, we also include instruments for measuring health in community populations.

Methods: We searched health and sociological databases (CINAHL, Medline, EMBASE, PsycInfo, Web of Science, JSTOR, ERIC, Social Sciences Abstracts, ProQuest), from inception to June 2021, for instruments measuring subjective health in veterans and community populations. Our review includes primary studies that either reported on the development of instruments measuring subjective health or studied their psychometric properties. To assess the clarity and applicability of instruments to Canadian veterans, we consulted with three veterans from the CPCoE. Using the COSMIN Risk of Bias tool, we assessed risk of bias of the eligible studies in which the instruments were identified from.

Results: Of 5,863 abstracts screened, we identified 45 eligible articles. We identified 45 instruments in the following categories: general (n=19), emotional (n=6), physical (n=4), social (n=3), spiritual (n=8), and oral health (n=5). Of these, eight instruments (Adult STRAIN, I COPPE, M2C-Q, PWB, WEMWBS, MQLI, CWI, and WBS), had good psychometric properties with high internal consistency (Cronbach's $\alpha > 0.82$) and overall low risk of bias. Five instruments (M2C-Q, NHP, SF-36, SHS, and WHOLQOL-BREF) were determined to be very applicable to veterans by our veteran partners.

Conclusions: This review provides a comprehensive overview of all instruments that measure subjective health and reports on their psychometric properties and applicability to veterans. We found that the M2C-Q showed good psychometric performance, low risk of bias, and the most applicable for use among veterans.

Poster Presentations

P140: Effectiveness and Engagement in Self-education: A mixed methods study for veterans living with chronic pain

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Introduction: Veterans have higher rates of chronic pain and may face barriers to access and success in pain management programs. To address the burden of chronic pain in Canadian Veterans, we are conducting a mixed methods study, combining the results of a systematic review (SR) on the effectiveness of self-education with a qualitative study exploring Veteran perceptions and experiences with engagement with self-education to create a model for delivery of self-education programs for Veterans with chronic pain and their families. Self-education before, during or after formal pain management and rehabilitation programs may be helpful for Veterans with chronic pain and their families. Working with Veteran partners, we will define 'self-education' in the context of chronic pain and identify what they think would be important to know if they were considering trying self-education.

Methods: Currently, we are searching the medical literature (following PRISMA guidelines and with support from a health librarian) for the best quality information on 'self-education' for self-management of chronic pain (including self-led, peer-led or health professional-led). We will compile this information to create a clear picture of how self-education might help, how much it helps, and who is most likely to benefit, with attention to the components of effective interventions and any potential effect modifiers. Evidence specific to the Veteran population will be foregrounded. The SR includes randomized controlled trials focused on self-education or self-management education

using all relevant online databases at McMaster University (e.g. Ovid MEDLINE(R) [1946 to Present], Embase and CINAHL), and excluding conference abstracts and theses. Risk of bias assessment will be conducted (with RoB2 tool) and quality of the evidence assessed (by GRADE). We will also compare what is known about self education specifically for Veterans, and if there are differences between what helps men vs. women.

Expected Results: Based on the summary of the best information from our ongoing SR, we will interview Veterans from different backgrounds and with different experiences to understand 1) their ideas about why, how and when they have used self-education; 2) how and when they would like to take part in self-education in the future, and 3) how they think it could be done best.

Conclusions: We will use the information from the literature and from what Veterans have told us to develop a model of how to deliver self-education programs for Veterans with chronic pain and their families. We think this model can guide the design of optimal self-management programs for veterans.

P147: The Clinician's Experience: Covid-19 Pandemic Transition to Digital Delivery of Trauma Therapy with Trauma-Affected Populations

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Introduction: The COVID-19 pandemic has significantly impacted the mental health of individuals globally. In response to increased mental health service demands and COVID-19 related public health restrictions, mental health clinicians rapidly shifted their services from in-person to digital delivery (e.g., teletherapy, telemedicine, eHealth, and mobile health).

This shift has been instrumental in maintaining continuity of care for trauma-affected populations (TAPs; public safety personnel, military members, Veterans, and civilian frontline workers). Many TAPs are routinely exposed to potentially psychologically injurious high-risk situations. COVID-19 may compound these traumatic injuries, possibly negatively impacting their well-being, mental health, occupational engagement, and relationships.

Responding to the needs of TAPs, many clinicians spontaneously adjusted their clinical practices to ensure TAPs were receiving therapy via digital means. Over the first two years of the pandemic, many clinical spaces gradually established protocols and obtained infrastructure required to safely provide digitally delivered trauma therapies to TAPs.

The objective of this study is to learn from clinicians, "what works, for whom, in what respects, to what extent, in what

context, and why?”, regarding the provision of digitally delivered trauma therapy to TAPs.

Methods: This ongoing qualitative study examines clinician’s experience transitioning to and delivering digital trauma therapy to TAPs. Data is collected through online semi-structured focus groups. Transcripts are coded using thematic analysis.

Expected Results: This ongoing exploratory study examined clinician’s experience transitioning to and delivering digital trauma therapy to TAPs. The participants (n=22) are mental health clinicians employed at the Edmonton Operational Stress Injury Clinic. Preliminary thematic analysis indicates that overall, most clinicians had positive experiences transitioning to and providing digitally delivered trauma therapies. Preliminary themes include context, efficacy, safety, and recommendations. Further data collection and analysis are required to support these findings.

Conclusions: It is anticipated that digital delivery of trauma therapy to TAPs will continue even as COVID-related restrictions relax. Study findings may assist clinicians providing ongoing trauma therapies to TAPs via digital means. These findings may inform future policy and practice and highlight the benefits and potential barriers of digital delivery of trauma therapy to TAPs.

P158: Team-based Primary Care for Canadian Armed Forces Veterans: A single case study

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Introduction: Military-to-civilian transition (MCT) involves leaving the military health care system and accessing primary care in the civilian health care system. MCT is an important transition considering Veterans experience some chronic conditions – such as chronic pain, posttraumatic stress disorder, depression, hearing problems, and others – more than the general Canadian population. Primary care is the first point of contact within provincial/territorial public health systems in Canada and is becoming increasingly interprofessional with multiple clinicians from different disciplines working together to provide care to patients. Recent research shows that primary care is a particularly important source of health care for Veterans. However, concerns have been expressed about the capacity of primary care providers to meet the unique needs of Veterans in provincial/territorial health systems. The purpose of this research was to understand how primary care is provided to Veterans in a team-based primary care model in a context where Veterans are understood as a population with unique health needs.

Methods: We conducted an exploratory holistic single-case study with a mixed methods convergent approach using a Family Health Team (FHT) in Ontario. Data collection included in-depth interviews, public FHT documents, and a chart audit of

Veteran patient charts. Each data set was first analysed separately: Interviews were analysed using thematic analysis, content analysis was used for documents, and descriptive statistical analyses were used for the chart audit data. Then, the data sets were integrated to provide an overall analysis of the case.

Results: We interviewed four clinicians and six Veteran patients, examined 14 documents, and audited 28 Veteran charts. Integrated analysis of the data revealed three themes: “Veteran-friendly space”, “A really satisfying group to work with”, and “The paperwork is horrendous.” The clinic made efforts to engage military-connected populations and Veterans valued clinicians’ awareness and knowledge of the military organization and culture. While Veterans appreciated being connected to a team, there was little use of clinicians other than nurses and physicians. Clinicians enjoyed working with Veterans but sometimes faced barriers to providing effective care.

Conclusions: The FHT was a Veteran-friendly clinic where Veteran’s unique health needs were understood and honoured. Future research should focus in improving primary care provision at clinics across Canada and increasing capacity for primary care research related to Veterans.

PRIMARYLY MENTAL HEALTH & WELL-BEING

Podium Presentations

1A04: Psilocybin Attenuates Past Conditioning, Promotes Behaviour Change and Facilitates Natural Learning: Reviews on the clinical potential of Psilocybin

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Introduction: Phase 2 clinical trials have established therapeutic efficacy for psilocybin-assisted therapies for depression, addiction, and advanced cancer-related anxiety and depression. To help evaluate the therapeutic potential of psilocybin and to translate scientific findings into the rapidly-evolving fields of psilocybin practice and policy, we conducted two complementary scoping reviews. My hypothesis was that psilocybin disrupts habit and potentiates behaviour change, opening a critical period of new learning in the post-acute time period of persisting effects.

Methods: Systematic database searches were conducted in Ovid MEDLINE and translated in Ovid, PsychINFO, EBM Reviews: Cochrane Central Registry of Controlled Trials, Web of Science Core Collection and ProQuest Dissertations and Theses from

October 2019 to September 2021. From records identified through database screening and using Covidence online software, duplications were removed, records screened, assessed for eligibility and included or excluded from full-text review. 8583 articles were screened, and 49 met inclusion criteria for our review of psilocybin-assisted therapies, and seventy-seven for our review of behavioural investigations of psilocybin in animals. To give a more nuanced understanding of psilocybin's effects we mapped the animal review results onto the Research Domains Criteria Framework of the National Institutes of Mental Health.

Results: Psilocybin-assisted therapies have been demonstrated to be safe and have clinical efficacy in the treatment of obsessive-compulsive disorder, depression, anxiety and depression due to advanced disease, substance use disorder, demoralization due to long term AIDS survival, and in the treatment of migraine headaches. Psilocybin has trans-diagnostic effect, with persisting effects lasting up to 18 months. In animals, psilocybin reduces the effects of past conditioning, increases sensitivity to context, and reduces the effects of chronic stress. Human trial quality is strong, though subjects lack diversity and psychological supports provided confound study outcomes.

Conclusions: Psilocybin has a strong safety profile, with transient anxiety and psychological distress the most significant adverse effect. Psilocybin for PTSD is untested, but low doses reduce fear conditioning. By disrupting past habitual programs of thought, feeling and behaviour, psilocybin effects a pause on past conditioning. Post-acute effects include improved mood, enhanced openness, heightened sensory awareness and heightened sensitivity to context. Goal-oriented behaviour, associative and social learning improved after psilocybin; habits of psychopathology are weakened. Larger clinical trials are warranted and further investigations are required to understand the role of psychological supports.

1B03: Critical Conversations: Moving the needle on Military Sexual Trauma in Canada

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Introduction: Military Sexual Trauma (MST) stems from Canadian Armed Forces (CAF) members' experience of military sexual misconduct (MSM). MST is a pervasive problem in the CAF, with thousands of individuals reporting MSM and resultant MST at some time in their career. Since October 2021, survivors of Military Sexual Trauma (people with lived experience, or PWLE) have been meeting with CAF leadership (meetings with have been dubbed "Critical Conversations", part of the Operation: Trauma Informed

Leadership project) to discuss the impact of MST on survivors, and to try to influence culture change within the CAF to help prevent MSM/MST.

Methods: Researchers on our team interviewed 8 PWLE of MST who participated in Critical Conversation (CC) sessions with CAF leadership from October 2021-March 2022. Data was collected through qualitative interviews over the telephone or secure video conference platform. Interviews were recorded, transcribed, and de-identified by a professional transcription service. The focus of the interviews was not on individuals' specific trauma, but on their experiences as participants in CC sessions with CAF leadership. Data were analyzed using thematic content analysis to explore the experiences of PWLE.

Results: Three themes emerged: Effects of the CC on the individual, Perceived effects of the CC on the institution, and Future Directions for the CC. Overall, the CC were well-perceived and offered survivors of MST an outlet to share their experiences and insights on how cultural change might happen within the CAF. In terms of personal growth, participants noted that the CC have helped them "find their voice", feel validated and empowered, to overcome guilt and shame related to their experience, and reclaim their identity and sense of community. Participants also identified perceived effects on the institution including that CC humanized the impacts of MST and showed that CAF as an institution is making a concerted effort toward culture change.

Conclusions: Overall, the Critical Conversations were reported as being a positive experience for the interviewees. Findings also offered insight into ways the CC could be improved or strengthened. This is initial research conducted on an emerging intervention (CC) and is by design a qualitative study using a purposive sample. Further psychometric assessments of the CCs' impact on participants' mental health status are forthcoming. At this early stage, however, the benefits of the CC were clear, and the findings from this study point to ongoing collaborations between PWLE of MST, CAF leadership, and the CAF institutional cultural change.

1B04: The Impact of Sexual Misconduct on the Deployment Experience of Female Veterans

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Introduction: Despite the work that has been done around deployment experiences in the Canadian Armed

Forces (CAF), a gap still exists regarding female-identifying gendered deployment experiences as well as the specific factors hindering effective integration of women within the CAF's ranks. Deployed women face many challenges, such as frontline combat contact with the enemy, post-combat exposure to injured/deceased people and potentially morally injurious events. One present, yet unfortunate, risk that all military members face during deployment is Sexual Misconduct (SM). Although SM is known to negatively impact mental health outcomes, there little-to-no research on how it impacts operational deployment in the CAF and military cohesion. Optimal military cohesion depends on the effective integration of female-identifying service members amongst their male counterparts. Research suggests a strong link between a lack of military cohesion and issues of gendered violence, such as SM. Thus, the purpose of the present study was to understand the impact of SM on women's deployment-related experiences, especially its impact on military cohesion.

Methods: Former female-identifying CAF members were interviewed (n = 15) to discuss their operational deployment experiences. Participants were recruited through social media posts to a CAF service women's group and word of mouth. Interview questions included participant's descriptions of their deployment, rewarding/challenging aspects of deployment, strengths participants brought to their deployment, physical impacts of deployment, supports available during deployment, and what advice participants would provide to female-identifying CAF members surrounding deployment. Importantly, no questions in the interview protocol directly asked about SM or military cohesion specifically. The data were analyzed using an inductive interpretive phenomenological approach to thematic analysis.

Results: Three main cohesions-related themes emerged from the interview data: Value, Acceptance, and Integration. Participants provided examples of situations in which these themes were upheld and examples in which they were not. Despite not being asked about SM specifically, SM revealed itself as a common thread among these three themes, undermining military cohesion during deployment.

Conclusions: Through a qualitative lens, the present study identifies three domains of military cohesion significantly impacted by SM during female-identifying members' operational deployment: Value, Acceptance, and Integration. Understanding female-identifying military members' experiences with SM in all contexts, including operational deployment, will assist government efforts to address SM within its military ranks and inform changes to military culture.

1B05: The Effect of Sexual Trauma on Intimate Partner Relationships: A scoping review

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Introduction: Sexual violence is a pernicious and highly prevalent form of gender-based violence around the world. Canadian data estimates that since joining the Canadian Armed Forces, approximately one in four women and one in 25 men have experience sexual assault at least once. Commonly cited psychological sequelae of sexual assault include shame, anxiety, depression, suicidal ideation, attempted suicide, and post-traumatic stress disorder (PTSD). PTSD following sexual assault is known to be associated with maladaptive cognitive schemas that are relevant to engaging in interpersonal relationships. The aim of this study is to understand how the literature conceptualizes and describes the link between sexual assault, PTSD, and intimate partner relationships (IPR).

Methods: A scoping review is used as set out by Arksey & O'Malley (2005) to identify and synthesize knowledge on the intersection between sexual assault, PTSD, and IPR. Five databases were searched, including MEDLINE, EMBASE, Web of Science, PsycINFO, and CINAHL to include English-language peer review articles from 1995 onwards. A total of 1679 articles were retrieved, 125 of which were included in a title and abstract screening, and 94 included in a full text review.

Results: The search has indicated that the vast majority of research is being conducted in the United States, with additional representation from Canada, the United Kingdom, New Zealand, Israel, and South Africa. The results indicate that the literature describes IPR as being heterosexual, therefore, highlighting a paucity of research on LGBTQ+ relationships. A preliminary analysis of the search results identifies how communication and sexual functioning may be salient issues for sexual assault survivors' mental health and relationship functioning, as well as highlights the unique considerations for those affected by military sexual trauma. Moreover, the frequency and quality of perceived partner support appears to be associated with lower PTSD symptom severity.

Conclusions: The purpose of the current scoping review is to determine how the literature understands and describes the intersectionality of sexual assault, PTSD, and IPR. This scoping review identifies existing gaps in the literature spurring on future work that aims to improve military member and Veteran wellbeing, as well as potentially inform the development of clinical interventions and supports for families affected by military sexual trauma. Additionally, this work will contribute to the growing understanding of how a history of sexual assault affects individuals, relationships, and the family unit

more broadly as researchers and clinicians continue to seek to improve supports available for military members.

1C01: Veterans Transition Network Five Day Transition Skills Course: Preserving connection in a time of isolation

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Program/Intervention Description: The Veterans Transition Network (VTN) has been providing trauma informed, clinician and peer supported group therapy for veterans with operational stress injuries since 1998. As of 2020, over 1500 military veterans, service members and RCMP officers have participated in the VTN's 10-day program offered over three weekends. The program has demonstrated high retention rates and beneficial outcomes such as reductions in post-traumatic and depressive symptoms.

During the COVID-19 pandemic, The VTN was forced to restructure the 10-day program in order to comply with COVID restrictions such as social distancing. Because of the close physical proximity required for therapeutic reenactment, the primary trauma repair technique used within the group, the result was the development of a 5-day course, which had a focus on teaching communication and emotional regulation skills, education on trauma and symptom management, and goal setting.

This presentation will describe the adaptations made to the successful 10-day program, and lessons learned from service delivery during COVID will be discussed. Results of the 5-day TSC program evaluation will be presented and further developments in the VTN program will be explored.

Evaluation Methods: Survey data was collected on several 5-day TSC cohorts across Canada, with pre, mid, and post-group data collection, as well as a three month follow up. Included in the survey were 23 measures of mood, personality, moral injury, PTSD, substance use, social support, and therapeutic milieu. Qualitative interviews with 5-day participants were also conducted.

Results: We anticipate reductions in symptoms, as well as improvements in social support, and good outcomes related to therapeutic milieu, similar to those we saw in our 10-day program. We expect these outcomes to maintain through the three month follow up period. Qualitative themes describe a sense of connectedness and the experience of positive change experienced as a result of the group milieu.

Conclusions: Unanticipated changes to the successful VTN 10-day program due to COVID, resulted in a 5-day skills program that was able to meet the mental health needs of

the veteran community despite restrictions. The program may have benefits similar to the prior iterations of the VTN program, pointing to further enhancements and efficiencies in program delivery going forward.

1C02: In Their Own Voices: An oral history of the Veterans' experience

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¹Canadian War Museum

Introduction: *In Their Own Voices* is an oral history project launched by the Canadian War Museum that aims to uncover and explore the collective and individual veterans' experience in Canada, from the Second World War to the present. Although we will delve into the veteran's war years to set the context and understand the individual's unique experience, much of our energy in interviews will be directed towards drawing out the postwar or post-conflict experiences of veterans. Our questions and the veterans' answers will shed light on the complex veterans' experience, ranging from the return from service, challenges faced in reintegration, and how a veteran's wartime and veteran experience was revealed over the decades. We will also interview veterans' family members, especially children, in an effort to better understand how the impacts of conflict and military service can ripple across generations.

Methods: The backbone of this project are the hundreds of oral history interviews we will conduct over the coming three years. As of April 2022, three months into the project, we have conducted more than 30. As our project unfolds, we will engage in additional multi-disciplinary research. We will draw on work done by historians who have researched the transition from military service to civilian life among veterans of the world wars. We will learn from veterans' memoirs and secondary source literature about the psychology of soldiers in combat and their postwar lives. We will benefit, also from research done by institutions focused on veterans' health, including the Canadian Institute for Military and Veteran Health Research. We will dig into fiction and poetry to try to get at truths that are difficult to express any other way.

Expected Results: We are too early in our research to report firm results. Common themes to be explored, however, are emerging. Some of these relate to fellowship among veterans post-service or postwar, mental injuries, memory and commemoration; nostalgia; grief and loss; pride; transitioning to civilian employment; what is shared and what is not.

Conclusions: Forum 2022 will be held early in the life of our research project. We believe we will have research results and hypotheses even at that early stage that will benefit participants and lead to valuable discussions. We are also extremely keen to receive feedback and advice to help shape our project as it develops.

1C04: Racial Disparity and Female Veteran Homelessness

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Introduction: According to the Canadian Department of National Defence systemic racism exist within the institutions of Canada including the Canadian Armed Forces (Department of National Defence 2020; Knight, 2021). Exploration of the impact of racism and discrimination in the United States and Canadian forces is imperative to ensure they are free of discrimination, racial inequality, and prejudice. The purpose of this presentation is to give voice to a group of female African American veterans who experienced racial discrimination during active duty and who suffered homelessness after their discharge. A 2002 report written for the U.S military by the Defense Equal Opportunity Management Institute concluded that, over the centuries, the experiences of minorities in the military were similar to the segregation and inequalities that existed in the overall American society (Webb & Herrmann, 2002). Although the military has prided itself on diversity within its ranks, African American and other minority service women and men continue to be the subjects of discrimination (Military Leadership Diversity Commission, 2011). Women of color also experience significant barriers to filing discrimination complaints. As a result, the true extent of racial discrimination in the armed forces may be masked (Stewart & Schneyer, 2020).

Methods: Data were collected from 14 African American female veterans who experienced homelessness after leaving the military. A life history grid and semi-structured interview guide were used during two 90-minute face-to-face interviews with each participant. Qualitative content analysis of the interview transcripts was conducted to identify major themes across the lifespans of study participants.

Results: This study found that 71% of the sample (10 of 14) experienced military sexual trauma, a rate higher than that reported in the extant literature. For these 10 participants, racism was a persistent thread that resulted in short- and long-term consequences. Six major themes shared by the participants emerged: traumatic experiences across the lifespan, entering the military to escape circumstances, racism, gender-related discrimination and sexism, difficulty transitioning from military to veteran status, and positive childhood experiences and proud moments during military service. This presentation will focus on the impact of racism.

Conclusions: The participants in this study demonstrated that racial inequalities continue to exist within the structure of the military. They would argue that racism adversely impacted their careers and their experiences after leaving the service including situations that led to becoming homeless.

3B04: Citizen-soldier not Warrior: Cultural dissonance and the negative impact on service and transition

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Introduction: Loss of cultural identity (“Tribe”) and purpose are seen as key challenges to transition (English, Dale-McGrath 2013, Belanger, 2011, 2012, Junger, 2016, Montgomery, 2017). “Immigration” has been used to describe the cultural difficulty of Veterans to transition back into civil society (Castro, Dursun, Pedlar, Thompson, MacLean 2019). “Immigration” suggests military service removes the “citizen” from the “soldier” making transition more difficult through loss of identity or self.

Methods: Literature review and case studies.

Expected Results: Historical analysis suggests that combatants of the western democracies in twentieth century conflicts were “citizen-soldiers” with significant cultural commonalities with the societies they defended before the differences created through service. Common culture bound citizen to soldier and assisted transition. However, “citizen-soldier” has been replaced by “warrior” as exemplar formally and informally (Breede, Davis, 2020) in modern militaries. In extreme cases, Viking mythology has replaced western values. This cultural mutation in Canada is partly a result of the deliberate adoption of the “warrior” in Canadian Armed Forces Leadership doctrine (Duty with Honour, 2009). Isolation of bases and “limited war” exacerbated the cultural divide. Erosion of historical knowledge has left civilian and military society bereft of “citizen-soldier” exemplars and its transition impact (Cook 2020, Granatstein, 1998, 2008, Neary, 2004, 2011, Morton and Wright 1987, Vance, 2007, Neary and Granatstein eds., 1998). As well, civil society moved away from balanced cultural values of self-reliance, duty, sacrifice, and community. The notion that western society has begun to disintegrate from within and has lost touch with its “killer apps,” while not yet a feature of veterans’ research, has been identified in geopolitical and economic fields (Ferguson, 2013, 2011, Huntington, 1996, Chua, 2007, Hanson, 2001, Landes 1998). The loss of self upon transition may be influenced by the cultural dissonance evolving between “warrior” and “citizen” culture such that the soldier no longer perceives in themselves the citizen and their self is embodied in the warrior. Acceptance of role of “citizen” may be an intangible obstacle to transition (English, Dale-McGrath, 2013).

Conclusions: Cultural dissonance leads the transitioning soldier to lose the tight bonds of military community and the artificially constructed sense of “warrior” self, while immigrating to a society which does not emphasize the values of team, service, and mission or provide the same intensity of experience. Cultural dissonance affects transition (and service discipline) but may be remedied by restoring the “citizen-soldier” exemplar through doctrine and education of both “citizens” and “soldiers”.

3C01: Suicide and Self-harm in Scottish Veterans: A 37-year retrospective cohort study

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Introduction: Suicide among veterans remains a major concern, although evidence continues to emerge that they are at no greater risk than the wider community. Non-fatal self-harm has been considered to be a precursor, although there is increasing recognition that this may not be the case. There is a paucity of evidence from the veteran community. We used data from the Trends in Scottish Veterans Health cohort to examine the patterns of suicide and self-harm and to explore associations.

Methods: Retrospective cohort study of 78,000 veterans and 253,000 non-veterans drawn from computerised national health and vital records, matched for age, sex and geography, using survival analysis to compare risk of suicide and major self-harm overall and by subgroup, and exploring associations with length of service and specific mental health conditions.

Results: In up to 37 years of follow-up, the risk of suicide was no greater in veterans than non-veterans. The highest risk was in the fifth decade of life and around 20 years after leaving service. There was an increased risk in women veterans, which was confined to middle-aged women and peaked at nearly 30 years after leaving. By contrast, self-harm was 44% more common in veterans, with the peak ages in the early 20s and early 30s, around 7 years after leaving service. Self-harm was strongly associated with shorter service, compared with little impact of length of service on the risk of suicide. Only 3.6% of veterans who self-harmed later died from suicide, compared with 4.5% of non-veterans, but for veterans under 30 years of age at the time of self-harm, only 2.6% had a record of later suicide. Only PTSD was more common in veterans who self-harmed, OR 1.47, $p < 0.001$.

Conclusions: There are important differences in the epidemiology of suicide and self-harm which support the view that they should not be considered on the same spectrum, especially among young people who self-harm. Whilst support for veterans to reduce the burden of suicide should focus on those in middle age, and especially middle-aged women, support to reduce self-harm should be directed at young and recently-transitioned veterans.

4A02: The Mental Health Effects of Exposure to Children Recruited and Used as Soldiers During Military Service

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Introduction: A growing body of research examines the mental health effects of moral injury, which is defined as perpetuating, observing, and/or failing to prevent acts that transgress deeply-held moral standards. One type of moral injurious event faced by military personnel is experiences encountering children recruited and used as soldiers. Such encounters may have substantial mental health implications for military personnel. To inform prevention and treatment programs for military personnel who experience these potentially morally injurious encounters, research is needed to understand their lived experiences with such encounters. The main objectives of this study are to improve understanding of the nature of encounters with children recruited and used as soldiers experienced by military personnel, and the mental health impacts of these encounters.

Methods: Semi-structured one-to-one interviews are being conducted in both English and French with Canadian Armed Forces military veterans who have encountered children used as soldiers during military service. Participants are being recruited using advertisements circulated widely among stakeholder institutions in Canada and via social media. In semi-structured interviews lasting approximately one hour, participants are being asked about their experiences encountering children recruited and used as soldiers during military deployment, and the mental health impacts of these encounters. Transcribed interviews are being analyzed using interpretative phenomenological analysis (IPA), a qualitative approach that understands phenomena as arising from the hermeneutic process of meaning making that individuals undertake to make sense of their lived experiences. IPA is a fundamentally idiographic approach to data analysis: each participant is treated as a unique case study to be examined independently to gain a deep understanding of their lived experiences and how they make sense of these experiences. Only after each case is investigated independently is the larger body of participants analyzed together to search for convergence and divergence of themes across participants.

Expected Results: Data collection and analyses are currently underway. Findings will be presented on major themes that emerge from the data regarding the nature of encounters with children used as soldiers and the mental health impacts of these encounters. Where possible, differences between men and women will be described.

Conclusions: The findings will be useful for developing recommendations on the kinds of training and supports that may be needed for military personnel who are deployed to regions where children are recruited and used as soldiers.

4A03: Moral Injury Due to Exposure to Children in Armed Violence During Military Service: A participatory action research project

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Introduction: The Dallaire Institute for Children, Peace and Security, in partnership with Centre for Addiction and Mental Health (CAMH) and the MacDonald Franklin Operational Stress Injury Research Centre, are conducting research to explore the experiences of military personnel who have engaged with children recruited and used as soldiers. The deployment of child soldiers in conflict zones is becoming more common (Hughes, 2006), which may put military personnel at greater risk for moral injury stemming from encounters with children recruited and used as soldiers. While a breadth of research has examined the mental health of former child soldiers, to date, there is no evidence documenting the impacts of witnessing or interacting with child soldiers on the mental health and wellbeing of military personnel.

Methods: This is a multi-phased participatory action research (PAR) project, led by a multi-disciplinary research team and advisory group that includes experts in mental health, military and veteran health, aims to co-identify and develop strategies that will mitigate the impacts of morally injurious experiences involving exposure to children recruited and used as soldiers during military service. This PAR project builds on previous research by our team, involving the collection of rich qualitative data on people's lived experiences encountering children recruited and used as soldiers during military service, and the mental health effects of these experiences. Based on key themes that emerge from these data, this PAR project will meaningfully and actively engage people with lived experience as well as mental health experts and military personnel in a process that seeks to situate power within the research process with those who are most affected by an issue and its interventions. Through the PAR process, military personnel will develop strategies for prevention, support and training to mitigate the impacts of morally injurious experiences.

Expected Results: This research is expected to inform prevention and treatment. Enhanced training and policies will better prepare personnel for complex deployments. Enhanced treatment will ensure appropriate care is provided for those who experience morally injurious events. The project will also foster greater collaboration between academics, the security sector, and health professionals to improve interventions in the area of moral injury.

Conclusions: This participatory action research project is

improving our understanding of the moral injury associated with witnessing children recruited and used as soldiers on military personnel's mental health and will help identify opportunities to enhance training, planning, and treatment to improve operational effectiveness and enhance protection for military personnel, veterans and their families.

4C01: Evaluating the Efficacy of a Smartphone Application (Drinks:Ration) to Reduce Alcohol Consumption in a Help-seeking Veteran Population: Results from a Randomised Controlled Trial

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Introduction: Alcohol misuse is higher in the UK Armed Forces (serving and veterans) than in the general population. We investigated the efficacy of *Drinks:Ration*, a 28-day brief alcohol intervention delivered via a smartphone app in reducing weekly self-reported alcohol consumption among UK veterans seeking help for mental health difficulties.

Methods: We performed a two-arm participant-blinded (single-blinded) randomised controlled trial. We compared a smartphone app that included interactive features designed to enhance participants' motivation and personalised messaging (intervention arm) with a version that provided government guidance on alcohol consumption only (control arm). Adults were eligible if they had served in the UK Armed Forces, were currently receiving, or had received clinical support for mental health symptoms and consumed 14 units (approximately 112g of ethanol) or more of alcohol per week. Participants received the intervention or control smartphone app (1:1 ratio). The primary outcome was change in self-reported weekly alcohol consumption between baseline and day 84 assessed using the Time-Line Follow Back for Alcohol Consumption.

Results: Between October 2020 and April 2021, 2708 individuals were invited to take part, of who 2531 did not respond, 54 were ineligible, 123 responded and were randomly allocated (1:1) to either the intervention or control arm (62=intervention; 61=control). 41 (66.1%) participants in the intervention and 37 (60.7%) in the control arm completed the primary outcome assessment. Between baseline and day 84, weekly alcohol consumption reduced by 28.2 [95% CI: -36.9 to -19.5] units in the intervention arm and 10.5 [95% CI: -19.5 to -1.5] units in the control arm (p-value=0.003; Cohen's d=0.35).

Conclusions: We have shown that participants who received the brief smartphone alcohol intervention which included interactive features and personalised messaging reduced their weekly alcohol consumption more than participants receiving guidance only. We believe that the use of the app could

streamline and improve patient-led health outcomes.

6B03: COVID-19 and Mental Health of Veterans in the Canadian Longitudinal Study on Aging

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Introduction: The impact of the COVID-19 pandemic has not been well studied in Veterans in Canada. The literature suggests both resilience and vulnerability of Veterans in response to the pandemic. Prior military trauma may translate to difficulty coping with the pandemic (e.g., increased social isolation), but may reveal the resiliency of older Veterans during challenging times. Given their prior military experience, are Veterans better equipped to cope with the pandemic, compared to the general population? We evaluate the impact of the COVID-19 pandemic on the mental health of Veterans in the Canadian Longitudinal Study on Aging (CLSA).

Methods: The CLSA COVID-19 Questionnaire Study was launched in April 2020 to better understand the impact of the COVID-19 pandemic on older adults. Participants completed a 30-minute questionnaire at baseline, weekly/bi-weekly and monthly questionnaires, and an exit questionnaire. Data collection ended in December 2020. This study involved over 28,000 CLSA participants, including 2,260 self-identified Veterans. The availability of pre-pandemic (from prior CLSA data collection waves) mental health measures including PTSD, depression, and anxiety facilitate the examination of changes in mental health during the first six months of the pandemic relative to pre-pandemic measures. These changes can also be examined in relation to Veteran status and military-related variables (e.g. branch, duration, and era of service).

Expected Results: At the COVID study baseline assessment, 16.2% of Canadian Regular Force, 17.9% of Canadian Reserve Force, 14.2% of Non-Canadian Veterans, and 20.8% of non-Veterans screened positive for depression (CESD-10). This compares to 13.9%, 14.4%, 12.2%, and 15.1% respectively pre-pandemic. Across all groups, a greater proportion of women screened positive for depression; potentially contributing to the higher proportion of positive screens among non-Veterans given that the CLSA Veterans were predominantly male compared to non-Veterans. Across Veteran groups, 18.3%, 18.1%, and 14.6% respectively experienced at least mild anxiety (GAD-7), compared to 22.2% of non-Veterans. Corresponding pre-pandemic figures were 7.4% of Regular Force Veterans, 8.9% of Reserve Force Veterans, 3.8% of Non-Canadian Veterans, and 9.2% of non-Veterans. Additional analyses will be presented that account for age/sex and other confounding variables.

Conclusions: Preliminary analyses suggest the frequency of depression and anxiety increased in the early months of

the pandemic across all Veteran groups; with the greatest increase among non-Veterans and Reserve Force Veterans for depression, and among Non-Canadian Veterans for anxiety. The CLSA COVID-19 Questionnaire Study provides a unique opportunity to evaluate the effects of the pandemic on Veterans.

6C01: Roles of Personality and Resilience in Associations between Combat Experiences and Post-traumatic Stress Disorder among Canadian Armed Forces Veterans

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Introduction: Canadian Armed Forces (CAF) Veterans encounter unique challenges associated with their service. Exposure to service-related traumatic events places them at risk for developing adverse mental health outcomes, including posttraumatic stress disorder (PTSD). Although some risk and protective factors associated with CAF Veteran mental health have been identified, past empirical research has not yet considered the impact of individual differences in personality on the development of PTSD. Given that models of personality, as well as resilience, have been shown to predict many important outcomes across psychological, vocational, and interpersonal domains, it is plausible that personality traits have an impact on associations between Veterans' combat experiences and PTSD. This research sought to assess whether seven personality traits (i.e., honesty-humility, extraversion, openness, emotionality, conscientiousness, agreeableness, and resilience) impacted associations between combat experiences and PTSD symptomatology in CAF Veterans in the past month.

Methods: We recruited a sample of 245 CAF Veterans (81% men; $M_{age}=48.47$, $SD_{age}=10.34$) via participant recruitment platforms (i.e., ParticipAid.co), word of mouth, social media, and email distributions within professional and Veteran networks. Participants completed a battery of questionnaires online through Research Electronic Data Capture (REDCap) pertaining to their personality trait levels, stressful experiences during military operations, and past-month symptoms of PTSD. Participant demographic information was also collected.

Results: Results showed that resilience, extraversion, and agreeableness were significantly and negatively associated with PTSD symptoms, whereas combat experiences and emotionality were significantly and positively associated with PTSD symptoms. Despite these relations, personality traits did not moderate the impact of combat experiences on PTSD symptoms. This suggests that although adaptive personality

traits were generally protective against PTSD symptoms, combat experiences influenced Veterans' mental health regardless of personality trait levels.

Conclusions: To date, no research has investigated whether broad personality traits impact the associations between combat experiences and PTSD. Through this project, we anticipate that clinicians can implement the findings in practice to enhance the well-being of Veterans and their families. For example, our findings demonstrated that trait resilience reduced levels of PTSD among CAF Veterans. Thus, clinicians can use this information to implement early interventions for Veterans designed to enhance facets of resilience, including their personal competence, tolerance of negative affect, and positive acceptance of change. Overall, this research supports the well-being of CAF Veterans and their families by enhancing military organizations', researchers', and policymakers' understanding of personality traits as risk and protective factors for PTSD symptoms.

6C02: 3MDR Research Impact Assessment: Examining the Collective Impact of Research by International Consortium Partners

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Brief Description: There is an urgent need to address the effectiveness of exposure-based therapies in veterans with PTSD and Moral Injury. This is a shared concern affecting partners in clinical research settings globally. 3MDR - a novel VR-supported exposure-based multi-modal immersive intervention for PTSD is being trialed by international partners with promising results. A consortium of partners across the US, UK, Netherlands, and Canada has been formed and is advancing research and practice regarding 3MDR. The consortium's research impact was assessed utilizing a ten-point guideline developed by Adam et al (2018), including: (1) context, (2) purpose (3) stakeholders' needs, (4) stakeholder engagement, (5) conceptual frameworks, (6) methods and data sources, (7) indicators and metrics, (8) ethics and conflicts of interest, (9) communication, and a (10) community of practice. This assessment demonstrates that international partners are preserving the standard of practice in delivering this novel therapy. The formation of a community of research that regularly meets also facilitates the spread and scale of 3MDR as well as standardization of the intervention, such as improving interventions for PTSD and MI.

Patient Population: Military members and veterans with combat-related, treatment-resistant PTSD and Moral Injury.

Results: As two recent independent RCTs have demonstrated, the 3MDR intervention reduced symptoms in male military veterans with treatment-resistant PTSD (the Netherlands and United Kingdom). Partners in San Diego, Washington and Canada (Ottawa, Edmonton) also started designing studies with 3MDR. Consortium partners have aimed to standardize the intervention, therapist training and 3MDR hardware and software. Over 40 individuals are now 3MDR-certified and modes of 3MDR delivery are evolving.

Conclusions: This research impact assessment shows how the formation of an international consortium has resulted in advancing evidence regarding 3MDR, standardizing this novel form of therapy, evolving 3MDR hardware, software, and standardizing training to deliver clinical care for veterans with PTSD and MI. As this presentation has shown, there is a need to preserve the standard of practice in delivering the therapy. This research impact assessment provides a basis for future 3MDR research as well as spread and scale of this intervention. Future directions include trialing VR-based interfaces such as the HoloLens, use of film script in the intervention, distance delivery of 3MDR, expanding the intervention to groups, and trialing 3MDR with other populations, including children and adolescents.

6C03: Network Analysis of Post-traumatic Stress Disorder Symptoms and Correlates in Canadian Military Veterans

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¹Western University; ²OSI Research Centre; ³Lawson Health Research Institute

Introduction: One of the approaches taken to psychometrics is the integration of network models which allow visualizing the entire topology of relationships between traits and questions that are used to analyze disorders such as PTSD. This analytical approach takes the assumption that symptoms co-occur owing to a causal interaction between them. Understanding the complexities and interactions of these symptoms is important for a more holistic understanding of PTSD in veteran populations as supported by data driven techniques. This study looks at the network structure among (1) the 20 DSM-5 PTSD symptoms, including common clinical covariates and (2) all of the prior including the Trauma-Related Altered States of Consciousness (TRASC) symptoms. We perform *k*-means clustering on this set to look for significant clusters which may be impacting the network analysis.

Methods: We utilized a large sample of Canadian military veterans, and analyzed the data from a subsample of 642 veterans who reported clinically significant DSM-5 PTSD symptoms. We reproduced the methodology of a state of the art network analysis using regularized partial correlation models. Clustering was performed on this set to look for

significant clusters, first by using the gap statistic to determine the optimal number of clusters based on variance in the dataset.

Results: Consistent with previous studies we found DSM-5 PTSD symptoms were positively connected within the network, especially a strong connection between nightmares and flashbacks. Additionally in the TRASC set, we see strong correlations between divided or multiple senses of self and losing time. There is a gender specific association to the TRASC dissociative item of feeling foreign body parts, and this feeling foreign body parts phenomenon has a strong linkage to out of body experiences. When examining network centrality for the non-TRASC analysis, we found the centrality of negative trauma-related emotions and detachment.

Conclusions: These results are supportive that network analysis can be reproduced between different populations, as we are able to reproduce the most significant findings between a US and Canadian military veteran cohort. The integration of other covariates and survey questions is a promising avenue for discovering further significant associations. Combined with clustering, this can help our understanding of PTSD subtypes.

6C04: Towards Treatment Algorithms for Post-traumatic Stress Disorder in Military Populations

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Introduction: The prevalence of posttraumatic stress disorder (PTSD) in Canadian veterans range from 8 – 18%. To treat PTSD, healthcare providers need to consider individual factors such as age, gender, and trauma exposures, as well as treatment factors such as availability, access, response, and tolerability. This presentation will overview a three-part project towards building consensus in the assessment and treatment of PTSD in military and Veteran populations. These components collectively seek to: (1) Provide a comprehensive scan of available treatment approaches for military-related PTSD via meta-analysis and systematic review; (2) Identify prescribing patterns and practices of psychiatrists treating PTSD across Operational Stress Injury (OSI) clinics across Canada; and (3) Develop a consensus model to guide the treatment of military-

related PTSD, with particular emphasis on treatment-resistant PTSD.

Methods: The pre-registered meta-analysis is conducted in accordance with PRISMA and Cochrane guidelines. A comprehensive search of the literature was conducted using the databases PsycInfo, Medline, Embase, CINAHL, and ProQuest Dissertations and Theses. After removal of duplicates, a total of 12,002 studies were screened for inclusion. The final sample includes data from over 400 studies providing psychotherapy, pharmacotherapy, and alternative and emerging therapies to treat PTSD in military and Veteran populations.

Expected Results: Findings from the meta-analysis will provide a snapshot of the current state of evidence on treatment approaches while identifying factors that may influence treatment outcomes. In parallel, a survey assessing at prescription patterns and practices will be released to psychiatrists treating Veterans within the OSI networks across Canada. The survey will gather information reflecting factors that influence prescribing practices, as well as patient information that determines the decision-making process during care.

Conclusions: Together, results from the meta-analysis and the prescription patterns survey will be aggregated and used as the basis of a consensus-building practice amongst treatment providers. Findings will better inform clinical decision-making for service providers and service users while shedding insights for future treatment development and practice recommendations to better support the wellbeing of military and Veteran populations.

6C05: Changes in Mental Health with Multi-modal Motion-assisted Memory Desensitization and Reconsolidation Treatment in Military Members and Veterans

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Program/Intervention Description: Military members and veterans are at elevated risk of treatment-resistant post-traumatic stress disorder (TR-PTSD) due to higher rates of exposure to potentially traumatic events during the course of duty. Knowledge of TR-PTSD is limited, and specific protocols or evidence-based TR-PTSD therapies are lacking. Multi-modal Motion-assisted Memory Desensitization and Reconsolidation (3MDR) therapy is an emerging intervention for combat-related TR-PTSD. The purpose of this study was to preliminarily assess

the effectiveness of 3MDR in addressing TR-PTSD in Canadian military members and veterans.

Evaluation Methods: This study is a longitudinal mixed-methods clinical trial. English-speaking military members and veterans aged 18-60 with TR-PTSD were recruited to participate. The intervention consisted of 6 sessions of 3MDR therapy. Quantitative data were collected pre-treatment, post-treatment, and longitudinally at 1, 3, and 6 months after completion of 3MDR.

Results: Results from the first 11 participants to complete the 3MDR protocol exhibited statistically significant improvement (surviving multiple comparison correction) in clinically administered and self-reported scores for PTSD (CAPS-5 and PCL-5), moral injury (MISS-M-SF), depression (PHQ-9), anxiety (GAD-7), emotional regulation (DERS-18), and resilience (CD-RS-25).

Conclusions: The preliminary and exploratory results from this clinical trial support the growing body of literature illustrating 3MDR as an effective treatment for military-related TR-PTSD. These results are notable given participants' previous lack of success with frontline psychotherapeutic and pharmacological interventions. Given that there are currently very limited treatment options for TR-PTSD, 3MDR could prove to be a valuable treatment option for military members and veterans with TR-PTSD.

6C06: Piloting Advanced Document Representations for the Prediction of One Year Treatment Outcome from Initial Clinician Assessment Notes

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Introduction: To support improved treatment outcomes in mental health, it is critical to integrate as much information as possible from early stages of treatment to help inform clinicians and patients predict any difficulties in treatment. Research has consistently shown that combat or military related post-traumatic stress disorder (PTSD) impacted individuals demonstrate a poor treatment outcome for both pharmacotherapy and psychotherapy. One of the earliest sources of information from a professional comes in the form of clinician notes and intake surveys. In this work, we take written clinician notes and apply a structured machine learning and natural language processing approach to aggregate the collection of words describing a patient's earliest presentations into a digital representation summarizing the words used to describe them. We demonstrate these representations can be used to predict treatment outcomes. The trained model is then capable of generating a risk score based on the language used in early assessments.

Methods: The representations used are a multi-stage learning process involving word representations and then document representations. Clinician notes from a single author (n=6192) were lower cased and had common English stop words removed. A word embedding was trained on the entire corpus of clinician notes using the GloVe word embedding method, giving each word used in the clinician notes a vector representation capturing similarity to other words in the corpus. These word representations were used to form document representations for initial assessment notes (n=133) for whom treatment outcome was known by taking a tf-idf weighted average of the vector form of words in the clinician note. The features of this vector are used with a support vector machine to predict treatment outcomes at 1 year using cross validation. Lastly, by using vector properties of the separating hyperplane the SVM produces, the individual words which are most impactful to this classification are obtained.

Expected Results: The word embedding was trained in GloVe with a (metrics from training GloVe embedding here). The accuracy of using these representations in aggregated tf-idf format per clinician note to measure was promising for a pilot study. The most common words are visualized using a word cloud.

Conclusions: This study highlights the importance of strong early assessment as a way of assessing treatment progress over time. Our results highlight the ability for aggregative data techniques to extract insights over a population, and could scale to larger combined datasets with improved results. Future research involving larger populations and different authoring clinicians are warranted.

Poster Presentations

P136: Paraprofessional Training for Veterans Transition Network: Healing ourselves, helping others

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¹Veterans Transition Network

Program/Intervention Description: The Veterans Transition Network (VTN) provides mental health services to veterans across Canada. Paraprofessionals, former soldiers who have previously completed the program, have been integral to program delivery for over twenty years. Previous research on their involvement in the VTN has demonstrated the importance of the paraprofessional role for therapeutic engagement. Paraprofessionals have been typically mentored in the group setting; however, formalized training was only recently developed and implemented to build skills, knowledge and capacity in our paraprofessional service providers.

Evaluation Methods: We evaluated four sets of peer trainings across Canada offered between December 2020 and July 2021. Skills developed included psychological first aid, communication skills, grounding, paraprofessional boundaries and creating safety, as well as training on how to assist veterans in navigating community resources. Training was offered in three levels. Participants were graduates of the VTN programs who expressed an interest in providing paraprofessional support. Participants completed surveys after Level 1 and 2 of the training, and then again after Level 3.

Results: Results demonstrated significantly increased confidence in their ability to provide paraprofessional (peer) support, and greater self care among participants. They also reported high levels of understanding of the concepts taught in group. The majority of participants indicated they wished to go on to provide paraprofessional services. Qualitative comments from participants highlight key areas of training effectiveness and opportunities for growth.

Conclusions: Although the VTN has included paraprofessional support in mental health service delivery for over 20 years, training took place informally. This presentation will outline the development and implementation of the training, share key concepts critical to military paraprofessional practice, and discuss the results of the program evaluation. Further recommendations regarding paraprofessional training will be made which may be of value to other organizations.

P137: Latent Class Analysis of Mental Health and Alcohol Outcomes for Veterans Resident in Northern Ireland

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Introduction: The Northern Irish (NI) veteran population has been excluded from veteran/military research due to NI security concerns. Mental ill (MI) health is often comorbid with risky drinking, and rates of MI health within NI are particularly high. To support NI veterans effectively it is important to understand what comorbidities exist for this population.

Methods: Latent Class Analysis was conducted on secondary survey responses of 609 NI veterans. Six scales of MH and alcohol use were included (anxiety, alcohol, depression, post-traumatic stress disorder (PTSD), complex PTSD and dissociative sub-type).

Results: Four distinct classes were elicited: Class 1 (n=62, 10.18%), the high depression/anxiety class; Class 2 (n=120, 19.7%) the highly comorbid class, where alcohol and dissociation suffered at moderate level and other four at a high level; Class 3 (n=61, 10.02%) the high PTSD with moderate alcohol and depression class; and Class 4 (n=366, 60.1%) the low comorbidity with moderate alcohol class.

Conclusions: Four sub-groups exist with specific comorbidities within the NI veteran population. Approximately 40% suffered comorbidities of between three to six MIs at moderate to high levels. If risky alcohol use at moderate levels was not necessarily associated with MI it may have cultural drivers; this requires further research. Interventions should address the different NI veteran-specific MI comorbidities.

P138: Predictors of Help-seeking in the Context of Mental Health and Alcohol Issues, for Hidden Veterans in Northern Ireland

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Introduction: It is suspected that Northern Ireland (NI) veterans have higher rates of poor mental health due to exacerbated trauma exposure. However, security issues create the tendency to self-marginalise, therefore, help-seeking (HS) for poor mental health is likely reduced. This study examined the predictors of actual HS behaviour, as these findings have implications for veteran care within NI.

Methods: Logistic regression was conducted on data from 603 participants. HS was defined as ever/currently having medication or therapy, with predictors being mental health comorbidities (alcohol, anxiety, depression, PTSD, C_PTSD, dissociation), attitudes towards mental health and transition. Analysis was adjusted for military and demographic factors.

Results: The main predictor of medication use was mental health comorbidity, with higher levels of comorbidity having a greater effect on current use. 'High comorbid all disorders' was the most salient predictor (OR4.37 'ever'; OR9.64 'current'), followed by anxiety/depression (OR3.61 'ever'; OR4.71 'current') and PTSD with moderate depression/alcohol (OR3.86 'current'). Being female (OR3.35) and deployment outside NI (OR2.07) predicted historic medication use. Poor transition, shorter length of service, positive attitudes and mental health diagnosis since discharge had positive but smaller effects on HS via medication. Therapy use was only predicted by transition (OR2.32), length of service (OR.96), attitudes (OR.47) and diagnosis since discharge (OR.13). Current therapy engagement was disregarded from analysis due to lack of variation in responses (not in therapy >90%).

Conclusions: Therapy and medication use had differing predictors, which is likely due to support service issues and the need to self-marginalise. NI veterans will HS mainly via medication, possibly because medication is free in NI and veterans do not have to disclose their military service within their medical records. Other factors likely drove historic therapy use; it is unclear if therapy was engaged in outside NI where support access is easier. A heavy reliance on social or peer support could act as a proxy for current therapy engagement. Social or informal support also allows veterans to remain hidden.

P139: An Interview Study of Beliefs About Confidentiality and Attitudes Towards Disclosure of Moral Injury

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Introduction: Military members and Veterans often encounter potentially morally injurious events (PMIEs) during their service. These encounters can put them at higher risk for developing moral injury, defined as the psychological distress in response to morally-transgressive situations. If untreated, moral injury can lead to such negative health outcomes as depression, suicide ideation, substance abuse, and posttraumatic stress disorder. However, the rate of help-seeking among military members who experience mental health issues is remarkably low. This study qualitatively evaluated factors associated with mental health help-seeking among individuals with CAF experience, including perceived confidentiality of information, and whether PMIEs impact the decision-making process.

Methods: The sample currently consists of 19 individuals with CAF Reserve or Regular force experience aged 26 to 64 years (M=47.89, SD = 10.22; 3 women, 16 men). Participants completed interviews via Webex in which they were asked questions about past mental health trauma experience, confidentiality concerns, and questions related to moral injurious events. The interviews were transcribed verbatim and coded using a grounded theory approach.

Expected Results: Most participants expressed concerns related to confidentiality of their information within the mental health care system. Data collection and analyses are ongoing. The results of this study indicate that military personnel are not always comfortable sharing information with a health care provider.

Conclusions: While analysis is still ongoing, most participants did express concerns related to the confidentiality of their information in a military mental health support scenario. Findings will allow clinicians and policymakers to determine whether specific regulations surrounding confidentiality should be modified to facilitate treatment-seeking.

P145: Therapeutic Interventions and Supports Available to Intimate Partners with a History of Sexual Trauma: A narrative review

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Introduction: Sexual assault is a growing health concern, and is correlated with numerous psychosocial health risks,

including posttraumatic stress disorder (PTSD), excessive drinking, and intimate partner violence (IPV). The experience and consequences of sexual assault are supplemented with stigma and other barriers proven to hinder mental health treatment seeking, particularly among women Veterans. The literature notes that women Veterans experience high rates of sexual assault before, during, and after military service. Women who have experienced military sexual trauma (MST) often report substantial challenges to their sexual and relationship functioning following the experience. While it is likely that clinicians will treat clients with interpersonal trauma history, there is a lack of research surrounding the supports and clinical interventions available to couples where one or both individuals have a history of sexual trauma. This review seeks to address this gap in the literature.

Methods: A narrative review is currently being conducted to identify and synthesize knowledge on the therapeutic interventions and supports available to intimate partner relationships whereby at least one partner has experienced sexual trauma. Five databases were searched, including MEDLINE, EMBASE, Web of Science, PsycINFO, and CINAHL to include English-language peer review articles from 1995 onwards.

Expected Results: The literature identifies several different therapeutic approaches that have been proven to effectively reduce PTSD symptom severity, negative cognitions, and relationship distress. The literature notes a number of approaches that can be considered, including solution-oriented frameworks, cognitive-behavioural models, emotionally focused couple therapies, and digital health technologies. Through work with those impacted by sexual trauma and their partners, clinicians can seek to amplify positive outcomes and opportunities for growth within relationships, integrate sexual trauma healing into ongoing relationship and sex therapy, and reduce individual symptomatology. The results also highlight a paucity of research on LGBTQ+ relationships, as well as relationships whereby men have been impacted by MST.

Conclusions: The aim of the current narrative review is to determine the therapeutic interventions and supports presently available to couples with at least one partner having experienced sexual trauma. This narrative review seeks to collate these findings in the literature spurring on future work, as well as potentially enhance future clinical interventions for individuals and couples with more unique circumstances, such as those who have experienced MST.

P146: Media Guidelines for Journalists Reporting on Veterans, with a focus on Post-traumatic Stress Disorder and Suicide

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Brief Description: Empirical evidence from the United States has shown that media coverage of topics related to Veterans' mental

health often promotes negative stereotypes about Veterans and members of the military. This can foster negative attitudes toward Veterans among civilians, which, in turn, can create significant barriers for Veterans and Veteran Families re-integrating into civilian society. There is a lack of data assessing the current state of Canadian media coverage of Veterans, and a corresponding lack of policy and/or guidelines for journalists reporting on topics related to the mental health of Veterans and their Families. To address this gap, a set of guidelines was co-developed by a variety of collaborating stakeholders — including researchers, Veterans and journalists — for journalists reporting on Veterans' mental health with a focus on post-traumatic stress disorder (PTSD) and suicide. These guidelines aim to encourage trauma-informed and recovery-oriented coverage of Veterans' mental health, with a view toward improving public attitudes toward Veterans and Veteran Families.

Patient Population: The target audience for the media guidelines includes Canadian journalists that report on Veterans and Veterans' mental health, as well as students of Journalism. Veterans and their Family members may also use the guidelines as a tool to advocate for a recovery-oriented approach to Canadian media coverage of Veterans and Veterans' mental health.

Results: The guidelines encourage journalists to seek and include perspectives from Veterans as well as mental health professionals in news stories about PTSD and suicide in Veteran populations. They also encourage journalists to use their platform to educate the public about Veterans' mental health by communicating stories of successful recovery and reintegration into civilian society, identifying help-seeking resources and available treatments, and considering the complex factors that contribute to Veterans' mental health concerns. The guidelines discourage journalists from using stigmatizing language in their news coverage, making generalizations about the mental health concerns of Veterans, and – when discussing suicide, specifically – explaining in detail the suicide method used.

Conclusions: If adopted by journalists, these guidelines may empower journalists to pitch and cover more stories related to Veterans and Veterans' mental health, using a trauma-informed approach. Such stories have the potential to foster more sympathetic and overall positive attitudes among civilians toward Veterans, which will have positive impacts on the lives of Veterans and their Families as they re-integrate into civilian society.

P148: Physiological and Behavioural Effects of Equine Facilitated Psychotherapy on Horses when Partnering with Veterans with Post-traumatic Stress Disorder

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Introduction: Veterans with post-traumatic stress disorder

(PTSD) participating in equine facilitated psychotherapy (EFP) have reported promising results when medical treatments have not improved their symptoms. While this may be therapeutic for humans, EFP may be stressful for therapy horses. Conversely, horses may consider EFP as a positive interaction and ultimately form a bond with the human. Horses participating in EFP are normally well-behaved and may not show obvious signs of stress or aversion during sessions. Undetected, long-term stress may lead to poor animal welfare resulting from a chronic negative affective state. The aim of this study was to explore the effect of EFP on physiological and behavioural responses of participating horses.

Methods: A prospective cohort study, comprised of 16 veterans, each matched with a therapy horse for the intervention period of 8 weeks, was conducted. Horses included 8 mares aged 5-29 years of various breeds. The program consisted of one-hour sessions including grooming and walking the horse in an indoor arena. Both a mental health professional and an equine specialist were present during sessions. Outcome measures included heart rate variability, cortisol, oxytocin, and behavioral assessments for each horse.

Results: There was no significant difference in either HRV or oxytocin measures because of EFP. However, a significant decrease was observed in cortisol from the pre- to post-session ($t(32) = 3.23$; $p < 0.01$). Conversely, the sum of stress behaviors was significantly increased at the end of the session ($F = 4.12$, $p < 0.02$, $df = 2, 81$) but were attributed to a particular horse, at the end of one isolated session.

Conclusions: Physiological measures indicated that horses, in general, were not stressed during EFP sessions and likely perceived EFP sessions as a neutral stimulus. In contrast, the prevalence of stress behaviours may indicate that individual horses were perturbed at times during specific sessions. The noted increase in stress behaviours may have been a reaction to the Veteran's emotional state which was generally more activated at the end of each session. Alternatively, it may be that the horse associated the end of walking with the point of being turned out and thereby demonstrated excitement. Monitoring equine behaviors during EFP sessions and differentiating between the horse's stress response resulting from the program versus reaction to a veteran's emotional state is an important consideration in equine welfare.

P149: Psychophysiological Effects of Equine-facilitated Psychotherapy on Veterans Diagnosed with Post-traumatic Stress Disorder

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Introduction: Veterans with Post-traumatic Stress Disorder (PTSD) often struggle with emotion and impulse control

resulting in the inability to appropriately handle even minimal stress which can lead to physiological dysregulation. Previous investigations into the use of medication for the treatment of PTSD have shown that medical intervention alone may not be sufficient. Equine facilitated psychotherapy (EFP) is an alternative treatment that has shown promise among Veterans. The aim of this study was to evaluate the psychophysiological effects of EFP on Veterans diagnosed with PTSD.

Methods: An eight-week prospective cohort study, consisting of four cohorts drawn from a convenience sample of 16 Veterans (5 females, 11 males) began in January 2020. The delivery of the intervention continued in accordance with the limitations of the COVID-19 pandemic until March 2021. Each participant was matched with a therapy horse for the entire period of the 8-week EFP intervention. The program consisted of a one-hour therapeutic session in which the participant interacted with the horse primarily by grooming and leading the horse in an indoor arena. Both a mental health professional and an equine specialist were present during each session. Outcome measures included daily physiological (heart rate variability, cortisol, and oxytocin) and psychological assessments, as well as a pre-program review of psychological traits based on a battery of standardized questionnaires.

Results: Mean cortisol measures decreased ($t(106) = 4.30$; $p < 0.01$) and daily self-reports of mood ($t(107) = 4.66$; $p < 0.01$), anxiety ($t(107) = 4.68$; $p < 0.01$) and well-being ($t(107) = 6.64$; $p < 0.01$) improved after each session. Oxytocin measures were highly variable and did not support any directional effect. Mean HR ($F=14.27$; $p < 0.01$; $df=2,216$), and SNS index ($F=6.01$; $p < 0.01$; $df=2,216$) were significantly greater at the end of the session compared to baseline while mean RR ($F=12.39$; $p < 0.01$; $df=2,216$) and PNS Index ($F=10.91$; $p < 0.01$; $df=2,216$) were significantly decreased. No other HRV measures were significantly different across activities.

Conclusions: The results of this study showed that EFP had a positive impact on the perceived post-program responses of human participants, with a concomitant decrease in salivary cortisol. Further, although the post-program increases in SNS and decrease in PNS indices are contrary to what might be expected when a program has a positive effect, previous research indicates that exposure to horses can animate humans which subsequently leads to physiological arousal without causing an increase in emotional stress.

P154: Stellate Ganglion Block for Post-traumatic Stress Disorder in Military Veterans and Royal Canadian Mounted Police: A Case Series

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Introduction: Current evidence-based treatments for PTSD do not directly reduce sympathetic activity, making it more difficult for patients to engage in and benefit from trauma-focused therapy or medications. In the last decade, several studies have demonstrated that Stellate Ganglion Block (SGB), a procedure originally targeted towards neck and upper limb pain, can result in a rapid and sustained drop in symptoms of PTSD such as hyperarousal and anxiety. Studies reveal mixed, yet encouraging results, and given the safety of this quick procedure, it is becoming increasingly popular in the US; but its use and effectiveness have not yet been evaluated in Canada. The aim of this study is to explore the efficacy of SGB as a treatment for PTSD in a sample of Canadian Armed Forces (CAF) Veterans and Royal Canadian Mounted Police members.

Methods: Sixteen participants (15 male and 1 female, mean age 48 years) gave consent to and underwent the SGB procedure after meeting inclusion and exclusion criteria. Most were CAF veterans and all were diagnosed with PTSD. Right-sided SGB was performed with an ultrasound-guided injection of local anesthetic around the stellate ganglion in the neck. Data were collected at 1-week pre- and 1-, 2-, 4-, and 8-weeks, and 6-months post procedure. Measures included the PTSD Checklist for DSM-5 (PCL-5), Quick Inventory of Depressive Symptomatology (QIDS-SR), and Outcome Questionnaire (OQ-45).

Expected Results: Out of the 16 participants, four underwent the procedure twice. Available mean total scores of PCL-5, QIDS-SR, and OQ-45 decreased by 8-weeks post. Seven participants were responders on the PCL-5 (at least 10-point decrease) with an approximate 11-point mean reduction by 8-weeks post. For those who underwent the procedure once, none remitted in their PTSD symptoms; however, two participants who underwent the procedure twice, remitted by 6-months post (PCL-5 below 33). QIDS-SR scores dropped from the severe to moderate range, showing improvement in depressive symptoms, and the average mean total score decreased by nearly 5 points. General distress and functioning, as evaluated by the OQ-45, showed an average 13-point decrease in the total score, with a 14-point drop being clinically significant.

Conclusions: Our pilot results suggest clinical safety and utility of SGB in alleviating PTSD symptoms and opportunities to achieve remission. Further research is warranted around SGB's adjunct potential in advancing treatment of PTSD in CAF soldiers and veterans, as well as first-responders, and around the optimal parameters of its use.

P159: Evaluation of Repetitive Transcranial Magnetic Stimulation in Treatment-Resistant Posttraumatic Stress Disorder and Major Depressive Disorder in Patients at Carewest Operational Stress Injury Clinic

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Introduction: Posttraumatic stress disorder (PTSD) and major depressive disorder (MDD) are significant causes of functional impairment and morbidity among active duty and retired Canadian Armed Forces (CAF) and Royal Canadian Mounted Police (RCMP) members. Current treatment approaches can at times be sub-optimally effective, and development of additional treatment options is critical, particularly for treatment-resistant MDD and PTSD. Repetitive transcranial magnetic stimulation (rTMS) is a non-invasive brain stimulation therapy that has been shown to reduce symptoms in patients with treatment-resistant MDD and PTSD. Here, we present treatment outcomes for rTMS administered to CAF and RCMP clients with treatment-resistant MDD and PTSD at the Carewest Occupational Stress Injury (OSI) clinic.

Methods: Our study's population included 28 CAF and RCMP members with treatment-resistant PTSD and MDD, seen from January 2019 to May 2021 at the Carewest OSI Clinic. Treatment-resistance was defined as failure to respond to at least 2 antidepressant medications and at least one evidence-based psychotherapy. Patients were treated with left-sided high-frequency (LSHF) rTMS at 80-120% resting motor threshold (RMT) over the dorsolateral prefrontal cortex (DLPFC). Treatment involved 20 sessions, 5 days per week for 4 weeks. 10 additional sessions were provided if needed. If patients did not respond after 20 sessions, treatment changed to right-sided low-frequency (RSLF) treatment over the DLPFC. Patients completed the Patient Health Questionnaire 9-item Scale (PHQ-9) for depression screening and the PTSD Checklist for DSM-5 (PCL-5) for trauma symptoms screening prior to treatment and every 10th rTMS session. Outcomes were compared using a one-way repeated measure ANOVA.

Expected Results: Depression scores decreased over the course of rTMS treatment from moderately severe depression at initial screening (M=18, CI(16-19)) to moderate depression at the 20th (M=11, CI(9-13)) and 30th sessions (M=10, CI(8-12)), ($p<0.001$). PCL-5 scores also decreased significantly over the course of treatment (initial (M=48, CI(44-51)), 20th session (M=33, CI(28-38)) and 30th session (M=31, CI(25-37))($p<0.001$)).

Conclusions: Preliminary results revealed significant improvements in depression and trauma symptoms measures over the course of rTMS, which adds to the growing body of literature of treatment options for RCMP and CAF members with treatment-resistant MDD and PTSD.

P160: Outcome Predictors of Mental Health Care for Nova Scotians with Operational Stress Injury

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Introduction: Many people with operational stress injury (OSI), such as military service or police work related trauma and stressor related disorders or depressive disorders, do not recover sufficiently even with evidence-based mental health care. We examined outcome predictors of mental health care (MHC) for people with an OSI in Nova Scotia.

Methods: A retrospective health record review was completed for 107 Canadian Armed Forces (CAF) and Royal Canadian Mounted Police (RCMP) members and Veterans who received MHC (psychotropic medications and/or psychotherapies) at a specialized outpatient Mental Health clinic. The primary outcome measure was change from baseline to one year after starting MHC, using the total score of the Outcome Questionnaire 45.2 (OQ-45.2). Nine possible predictors were examined, including pre-deployment, deployment and post-deployment related factors. A multinomial logistic regression was conducted. Research ethics approval was obtained.

Expected Results: Baseline score of the OQ-45.2, baseline diagnosis of depressive disorder, and baseline active substance misuse significantly predicted the primary outcome.

Conclusions: Mental health and substance use challenges soon before the start of MHC significantly predicted insufficient improvement in this sample. Longitudinal research involving more sites with a larger sample may confirm or refute these findings and address more outcomes and more predictors.

P167: Development of a Virtual Cognitive Behavioural Therapy for Insomnia Group at the Carewest Operational Stress Injury Clinic

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Program/Intervention Description: The Calgary Carewest Operational Stress Injury (OSI) Clinic serves active-duty members and veterans of the Canadian Armed Forces, and members of the Royal Canadian Mounted Police who have been diagnosed with an OSI, including posttraumatic stress disorder, depression, anxiety, or other mental health disorders. This population often presents with significant comorbid sleep problems, which can play a central role in developing and maintaining these mental

health disorders, and therefore requires particular clinical attention. Cognitive Behavioural Therapy for Insomnia (CBT-I) targets the thoughts and behaviours that perpetuate insomnia, and typically produces reductions in insomnia severity within six weeks of treatment. This intervention has previously been offered individually at our OSI Clinic to good effect. To increase treatment accessibility and incorporate peer support, we are piloting a CBT-I group delivered via telemedicine. This closed group format includes six 90-minute sessions incorporating psychoeducation, cognitive and behavioural tools, and sleep restriction therapy. Participants also complete homework, including daily sleep logs.

Evaluation Methods: Participants will complete pre-and post-treatment measures, including the Insomnia Severity Index (ISI) and Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS). Participants will also complete a brief survey after each session for knowledge-check and to provide qualitative feedback. Groups will consist of 8-15 participants. Currently, one cohort has completed the CBT-I program. As additional rounds of the group are completed, data will be gathered and analyzed in aggregate to examine the effectiveness of the CBT-I program.

Results: Paired sample t-tests will be conducted to examine potential changes in scores on the ISI and DBAS over the course of the CBT-I group. A decrease in DBAS scores will represent a change towards more adaptive thinking regarding sleep, while a decrease in ISI scores will represent an improvement in subjective reports of insomnia severity. Cohen's *d* will be calculated to examine the magnitude of the effect size of any observed differences.

Conclusions: If results support the effectiveness of this virtual group-based CBT-I program, it will validate the utility of this program at the Carewest OSI Clinic. By offering this treatment in a group format, the burden on clinical time will be alleviated, allowing for more resources to be available for individualized treatment of other mental health disorders. If results of this study are significant, it will also provide empirical support for applying this treatment modality through remote administration, which may increase the accessibility for clients.

P168: Differences in Negative Cognitions in Suicidal vs. Non-suicidal Canadian Armed Forces Service Members and Veterans Experiencing Moral Injury

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Introduction: Consistent associations have been demonstrated between exposure to potentially morally injurious events (PMIEs; events that deeply transgress one's core values) and suicidality. Studies examining cognitions in the aftermath of PMIEs have so far focused on those describing one's role in the event (e.g., I did something wrong), rather than those describing

one's sense of self (e.g., I am a bad person). Given that stable internal attributions of behaviour (e.g., I did a bad thing because *I'm a bad person*) are thought to be more psychologically harmful compared to unstable external attributions of behaviour (e.g., I did a bad thing in an ambiguous situation; Litz et al., 2009; Tangney et al., 2007), this is an important limitation. No study has yet investigated negative post-PMIE cognitions in relation to suicidality in a Canadian sample. The objective of this study was to explore differences in a range of negative cognitions in those endorsing and not endorsing suicidality.

Methods: This study was a secondary analyses of data obtained from a treatment-seeking sample of Canadian Armed Forces service members and Veterans who reported experiencing distress following a PMIE (*n*=55). As part of the study, participants completed a structured diagnostic interview, including a comprehensive module on suicidal thoughts, behaviours, attempts and impulses. Participants also completed the Trauma-Related Guilt Inventory (TRGI) and the Post-Traumatic Cognitions Inventory (PTCI).

Results: The sample was mostly male (81.2%) and Veterans (72.7%). All branches of service and rank categories were represented. Fifty-five percent (*n*=30) of participants endorsed some level of current suicidality, and 20.0% (*n*=11) reported a past suicide attempt. Group mean comparisons revealed no differences regarding guilt cognitions for TRGI hindsight/responsibility, *t*(53)=.64, *p*>.05, *d*=.17, sense of wrongdoing, *t*(53)=.55, *p*>.05, *d*=.15, and lack of justification, *t*(53)=.84, *p*>.05, *d*=.23, or PTCI self-blame, *t*(53)=0.11, *p*>.05, *d*=.03, but showed significantly higher scores on subscales capturing negative cognitions about the self, *t*(53)=2.71, *p*<.01, *d*=.73, and the world, *t*(53)=2.28, *p*<.05, *d*=.62, measured by the PTCI.

Conclusions: Our results suggest that negative cognitions focused on stable features such as identity and the nature of the world, rather than one's own actions during an event, may be more important in their association with suicidality following a PMIE. This is consistent with the notion that shame, rather than guilt, is more problematic in its role in psychopathology and suicidality. This study is limited by its small sample size and exploratory approach, and future research is needed to replicate and extend these findings.

P169: The Minority Mosaic Framework: Uncovering the intersectionality of minority stress experiences among Canadian Military Members, Veterans, LGBT Purge survivors, and civilians

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Introduction: Despite societal and legal progress regarding historically disadvantaged groups, sexual minorities (i.e. lesbian, gay, bisexual, and other individuals who do not identify as homosexual) continue to be exposed to high rates of minority stressors (e.g. discrimination, violence, internalized homonegativity, rejection sensitivity, and microaggressions) and insidious trauma. It is increasingly being recognized that the qualitative experience of minority stress among LGBT military members and Veterans is unique as compared to civilian populations. Furthermore, during the LGBT Purge, LGBT members of the Canadian Armed Forces, the RCMP, and the federal public service were systematically discriminated against as a function of government policy within Canada. Critically, minority stress exposure has been linked to negative mental and physical health outcomes among military members, Veterans, LGBT Purge Survivors, and civilians. The proposed research innovation aims to better understand the lived experiences of minority stress exposure from an intersectional perspective related to race, ethnicity, gender, and sexual orientation among Canadian military members, Veterans, LGBT Purge Survivors, and civilians. Here, we aim to uncover mechanisms of both risk and resilience for mental and physical health outcomes among sexual minorities.

Methods: Adult military members, Veterans, LGBT Purge Survivors, and civilians who identify as sexual orientation minorities were recruited for our study across Canada. Participants completed a comprehensive DSM-based clinical assessment to capture the psychological impact associated with minority stress exposure, and completed several 1:1 qualitative interviews. A battery of validated self-report questionnaires were also administered to measure various levels of minority stress and mental/physical health outcomes.

Expected Results: We will present our novel minority mosaic framework, which is a theoretical model designed to effectively represent multidimensional minority identities (related to race, ethnicity, gender, and sexual orientation) in the research context. Data analyses for this program of research are ongoing for qualitative interviews and clinical assessments. Preliminary psychological and behavioural findings will be presented at the conference.

Conclusions: By elucidating risk and resiliency pathways, our program of research has the capacity to help military members and Veterans, as well as LGBT Purge Survivors, that have been psychologically injured by minority stress experiences. Initial findings support the expansion of PTSD models to include insidious forms of trauma related to minority stress exposure. Of importance, we outline a detailed research agenda related to our novel minority mosaic framework as a means to inform future directions in the field of minority stress.

PRIMARYLY PHYSICAL HEALTH & WELL-BEING

Podium Presentations

4D03: Living with Acquired Loss of Limb Functionality: The family experience

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Introduction: This research presents a unique qualitative narrative of how veterans with acquired loss of limb/s functionality, and their families, adapt over the life course. Specifically, the research provides in-depth insight about how veterans and the family experience the psycho-social impact of loss of function of limb/s, identifies everyday barriers experienced by veterans and families living with acquired loss of limb/s function, how veterans and families work to overcome barriers, and to identify types of support needed by veterans and families living with loss of function of limb/s. This UK based research was in collaboration with Blesma: the limbless veterans, and funded by FiMT. The research follows its seminal pre-cursor, *Caring and Coping: the family experience of living with loss of limb/s*.

Methods: Using Grounded Theory methodology, data was collected from Blesma members (n = 306) with acquired loss of limb functionality, and family members, using unstructured interviews, semi structured interviews and online surveys using WHOQOL-Bref and their family's wellbeing using FROM -16. From these data sets, analysis details core themes that explains how veterans and their family's adapt to resultant abilities and disabilities.

Expected Results: Analysis identifies that adapting to acquired disability requires an acceptance of living in a 'post injury' state, where the past is always the present, within which abilities/limitations are rarely static. Progression to accept relies on accepting the constant changes that manifest as the result of injury/disease, some of which can be seen/predicted, and others will not be predicted/expected, and that abilities/limitations as rarely static. It is acceptance of the changing nature of abilities and disabilities that spurs acceptance, wellbeing, and future long-term planning. Integral, family acts as 'the centre of the storm' and 'the anchor' within which the resultant disability and changes in abilities and disabilities over time are seldom static. The core aspects of these findings will be presented using anonymised examples from the data.

Conclusions: Conclusions suggest practical recommendations for support organisations to develop, suggestions for future

research, and further development of an empirical evidence base to underpin policy making and service delivery, to enable sustained and positive change for veterans and their families. Furthermore, although this research was carried out with veterans and their family members, the recommendations are transferable to other persons with loss of limb functionality and their families.

5C01: Interventions for Management of Chronic Pain Secondary to Temporomandibular Disorders: A network meta-analysis of randomized trials

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Introduction: Temporomandibular disorders (TMDs) are a group of painful musculoskeletal conditions affecting the muscles of mastication, temporomandibular joints, and associated structures. TMDs are the second most common cause of chronic pain secondary to a musculoskeletal disorder, after chronic low back pain, and affects 5% to 12% of people globally. Several conservative, invasive, and irreversible treatments are available for chronic TMD pain, but their comparative effectiveness is uncertain.

Methods: We conducted a systematic review and network meta-analysis comparing all available interventions for chronic pain associated with TMDs. A guideline panel provided critical oversight for our review, including: (1) defining the study question; (2) categorizing interventions; (3) prioritizing outcome measures; (4) proposing subgroup analyses; and (5) informing if measures of precision associated with pooled effect estimates were imprecise. The panel included eight content experts (three dental surgeons, two general dentists, an oral & maxillofacial pathologist, a general internist, and a clinical pharmacologist), eight methodologists (four of whom are also front-line clinicians), a patient liaison expert, and three Veterans living with chronic pain associated with a TMD.

Results: 215 studies proved eligible for our review, of which 153 trials that enrolled 8713 participants and explored 59 interventions were included in network meta-analyses. All subsequent effects refer to comparisons with placebo. Effects on pain for 11 interventions were supported by high to moderate certainty evidence. The four therapies probably most effective for pain relief were cognitive behavioural therapy (CBT) augmented with biofeedback or relaxation therapy (risk difference [RD] for achieving the minimally important difference [MID] in pain relief of 1cm on a 10cm visual analogue scale 39%), mobilization (RD 39%), manipulation + postural exercise (RD 38%), and manual trigger point therapy (RD 34%).

The remaining six interventions were less effective, but more effective than placebo, showing RDs between 25% and 39%: CBT + NSAIDs, CBT, supervised postural exercise, usual care, supervised exercise, and supervised exercise + manual trigger point therapy. Moderate certainty evidence showed four interventions probably improved functional recovery: manipulation (RD for achieving the MID of 5-points on the short form-36 physical component summary score 40%), supervised exercise (RD 40%), acupuncture (RD 39%), and physical therapy (RD 35%). The certainty in effects for all other interventions was low or very low.

Conclusions: Interventions that promote coping and encourage movement and activity were found to be most effective for reducing pain and improving function associated with chronic TMDs.

6E01: Mortality and Cancer Incidence in British Military Veterans Involved in Human Experiments at Porton Down: 48-year follow-up

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Introduction: Concerns were raised by some veterans about their long-term health following their exposure to chemical warfare agents as part of the 'Service Volunteer Programme' at Porton Down, UK. We aimed to investigate whether veterans who attended Porton Down had increased rates of mortality or cancer incidence compared to veterans who did not attend.

Methods: We used data from the Porton Down Veterans Cohort Study comprising male UK veterans who participated in the 'Service Volunteer Programme', 1941-1989, identified from Porton Down experiment books, and a comparison group of similar 'non-Porton Down' veterans identified from military personnel files. Of 19,233 records retrieved for each group, 18,069 (94%) Porton Down and 17,588 (91%) non-Porton Down were included in our analytical sample. Mortality and cancer incidence data were obtained from national registries up to December 2019. Associations between Porton Down attendance and health outcomes were examined using Cox regression with adjustment for age, year of birth, demographics and military service characteristics.

Results: Over a median follow-up of 48.1 years, 10,889 Porton Down veterans (60.3%) and 10,657 non-Porton Down veterans (60.6%) had died. After full adjustment, overall, Porton Down veterans had a 7% higher rate of all-cause mortality compared to non-Porton Down veterans (hazard ratio=1.07, 95% confidence interval 1.04-1.10). For cause-specific mortality, Porton Down veterans had higher rates of death from infectious and parasitic (1.43, 1.05-1.94) and genitourinary

diseases (1.45, 1.12-1.87), external causes (1.23, 1.07-1.43) and deaths attributable to alcohol (1.48, 1.09-2.02). Associations with all-cause mortality were stronger for veterans who attended Porton Down between 1960 and 1964 (1.36, 1.20-1.54); likelihood-ratio test, $p=0.006$. There was no association between attendance at Porton Down and overall cancer incidence (0.99, 0.95-1.03).

Conclusions: Overall, mortality rates were slightly higher in Porton Down veterans, but there was no difference in cancer incidence. Associations for mortality were stronger in Porton Down veterans who attended in the early 1960's. Health providers should be aware of the specific health issues and concerns surrounding military personnel and others (e.g. civilians and emergency responders) who may have experienced exposure to chemical warfare agents.

Poster Presentations

P151: Determining the Effectiveness of Aquatic Exercise in Comparison to Land-based Exercise for Canadian Military Veterans Experiencing Chronic Lower Extremity Musculoskeletal Pain: A feasibility study

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Introduction: Forty-one percent of Veterans experience constant pain or discomfort, which is close to double the twenty-two percent reported by the Canadian population¹. Evidence suggests that Veterans have unique pain management needs² and evaluation of interventions is urgently needed to address the complex needs of Canadian military Veterans living with chronic pain. Clinical practice guidelines³ suggest physical activity and exercise interventions as first-line treatment for people with lower extremity musculoskeletal pain, but do not provide direction on what type of exercise is most effective for people with lower extremity pain. Aquatic exercise is a possible treatment option that may improve outcomes in military Veterans with chronic pain. Aquatic exercise has previously been shown to decrease pain, improve function or disability, increase quality of life, and improve health-related fitness measures^{4,5}. Given their unique health needs, there is a need for evidence specific to military Veterans in order to inform service delivery.

Methods: Thirty Canadian military Veterans who have chronic (>12 weeks) lower-extremity musculoskeletal pain will be recruited to participate in this parallel group pilot randomized controlled trial (RCT) to determine the feasibility of conducting a future fully powered RCT to determine the effectiveness of aquatic exercise versus land-based exercise. Participants will be randomly assigned to either the aquatic exercise group or

the land exercise group for active-based therapy. Participants in both groups will be scheduled for 45-minute appointments, two times per week for 8 weeks with a follow-up at 20 weeks. Exercises will be individualized to the abilities of the participants and will progress in intensity throughout the 8 weeks.

Expected Results: Feasibility outcomes will be reported descriptively, including recruitment rate, retention rate, outcome measure completion rate, treatment fidelity, and treatment adherence. Semi-structured interviews will be completed with 8-10 participants from each arm, as well as treatment providers, to understand the acceptability of the intervention, barriers and facilitators to conducting the intervention, and strategies for implementing the intervention.

Conclusions: The current body of research comparing aquatic exercise to land exercise is limited by small samples sizes and risks of bias, making it difficult to draw conclusions and apply the evidence of effectiveness in practice. There are opportunities to improve rigor by reducing the risk of bias and conducting a fully powered trial. Prior to conducting a fully powered trial, there is a need for a pilot study to determine the feasibility of carrying out the interventions and trial procedures.

P155: Mortality and Cancer Incidence in British Military Veterans Exposed to Sarin During Human Experiments at Porton Down

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Introduction: Concerns were raised by some veterans that their participation in chemical warfare agent research as part of the 'Service Volunteer Programme' at Porton Down, UK, may have affected their long-term health. We aim to investigate whether veterans exposed to sarin and other nerve agents have increased rates of mortality or cancer incidence compared to veterans who did not attend Porton Down.

Methods: The study uses data from the Porton Down Veterans Cohort Study, which is the largest and best-documented dataset with quantitative information on chemical warfare agent exposures, globally. The cohort comprises of male UK veterans who participated in the 'Service Volunteer Programme', 1941-1989, identified from Porton Down experiment books, and a comparison group of similar 'non-Porton Down' veterans identified from military personnel files. Of 19,233 records retrieved for each group, 18,069 (94%) Porton Down and 17,588 (91%) non-Porton Down will be included in our analytical sample. Mortality and cancer incidence data were obtained from national registries up to December 2019. Cox regression will be used to examine the

association between nerve agent and sarin exposure (total dose, number of tests, and biological effect e.g. percentage change in cholinesterase activity) and mortality and cancer incidence over follow up. Adjustments will be made for age, calendar period, branch of service and co-exposure to other chemical agents including sulfur mustard, nitrogen mustard, pyridostigmine, and nerve agent antidotes.

Expected Results: 3,597 Porton Down veterans were exposed to at least one type of nerve agent, with 2,980 exposed to sarin. Most veterans (92%) were exposed to a single nerve agent test, with 72% of tests taking place during the 1950s. By the end of December 2019 for those exposed between 1950 and 1960, 62.6% of sarin-exposed veterans had died, compared to 63.4% of non-Porton Down veterans ($\chi^2(2)=3.01$, $p=0.21$). For cancers, 62.2% of sarin-exposed veterans registered any cancer compared to 60.4% of non-Porton Down veterans ($\chi^2(1)=2.31$, $p=0.13$).

Conclusions: Our forthcoming findings, using fully adjusted regression models may be of additional interest due to the potential use of sarin during the 1991 Gulf War, and more recently, by rouge states.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Podium Presentations

1A02: Risks and Benefits of Medical and Recreational Cannabis Use In The Veteran Population: A scoping review

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Introduction: Authorization of cannabis for medicinal purposes by Canadian Veterans has been supported by a reimbursement plan through Veterans Affairs Canada (VAC) since 2016 (Hehr, 2016). Reimbursement costs associated with medicinal cannabis use has since been exponentially rising. Surprisingly, very little is known about medical cannabis use by Canadian Veterans, including the benefits and harms of use to them and their families that would enable them to make informed decisions about their cannabis use. This is a significant knowledge gap.

This scoping review aims to understand the perceived benefits, harms, and knowledge gaps/recommendations for cannabis use by Veterans and the associated impacts on their families. Research questions:

1. What are the potential harms, risks or benefits associated with cannabis use by Canadian Veterans?
2. How does gender/GBA Analysis inform the findings?

Methods: Studies were identified using MEDLINE (Ovid), EMBASE, APA, PsycINFO, CINAHL PLUS, Web Of Science, SCOPUS, and Google Scholar. Narrative synthesis and the PRISMA-ScR guided reporting of findings.

Expected Results: Of 1571 identified articles, 109 studies met the inclusion criteria.

Conclusions: There is a lack of Canadian studies exploring the risks and benefits of cannabis use in Veterans. Among the predominantly American studies, there appears to be a focus on risks/harms with limited focus on its benefits. This bias is most evident in the abundance of articles focused on substance use disorder (SUD) and cannabis use disorder (CUD) - as the harm of cannabis use is inherent in the term disorder. Cannabis use was often accompanied by negative or neutral connotations, with little to no discussion of benefits. When cannabis was presented positively, it was usually in the context of Veteran outlooks, listing their reasons for use. Several studies focused on medical conditions and the impact of cannabis use on those medical outcomes, rather than overall Veteran well-being, including general functioning, psychosocial, and spiritual impacts. Studies often focused on cannabis and PTSD treatment governed by contradictory results, with some praising its therapeutic effects and others warning of risks. Balanced longitudinal research is needed that includes benefits and risks, as well as short and long-term impacts of cannabis use on physical and mental health, family/relations, employment, and the general well-being of Veterans.

1C03: La transition vers la vie civile des vétérans et des vétérans québécois : un examen des facteurs explicatifs de la satisfaction au travail et de carrière

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Introduction: La transition de la vie militaire à la vie civile s'avère difficile pour plusieurs vétérans. La satisfaction à l'égard de la vie civile permet de mesurer le succès de cette transition. La réussite de la transition et la satisfaction du vétéran et de la vétérane à l'égard de sa vie civile reposent sur le fait d'occuper un emploi satisfaisant (Roses et al., 2018). Un.e vétéran.e qui éprouve de la satisfaction vis-à-vis son emploi est plus susceptible de s'adapter facilement à sa vie civile (Maclean et al., 2019). De plus, la satisfaction au travail et de carrière seraient associées positivement à la santé mentale et physique, sur le plan de l'épuisement professionnel, de l'estime de soi, de l'anxiété et de la dépression (Faragher et al., 2013). Comme l'emploi est un facteur déterminant pour la santé, le bien-être et la réussite de la transition de la vie militaire à

la vie civile (Maclean et al., 2019), ce projet vise à examiner les facteurs individuel, psychosocial et organisationnel qui expliquent la satisfaction au travail et de carrière des vétérans.

Méthodes: Cette étude quantitative est basée sur un questionnaire auto administré en ligne. La population visée est les hommes et les femmes libérés des FAC qui occupent actuellement un emploi civil ou en ont occupé un récemment. Amorcée à l'hiver 2022, la collecte de données se terminera en mai 2022. Les variables ont été mesurées en prenant appui sur les écrits (p. ex. la satisfaction au travail et de carrière, le soutien organisationnel perçu, le soutien social perçu, etc.). Des analyses statistiques descriptives et bivariées seront réalisées à l'aide du logiciel SPSS.

Résultats attendus: Les résultats permettront d'examiner l'effet respectif des facteurs d'ordre individuel, psychosocial et organisationnel sur la satisfaction au travail et de carrière. Des résultats préliminaires seront présentés dans le cadre du Forum. Cette recherche apporte une contribution scientifique et pratique. En abordant simultanément trois niveaux de facteurs explicatifs de la satisfaction de carrière et au travail des vétérans québécois, elle bonifie les connaissances sur la vie civile et professionnelle des vétérans, un thème ayant rarement été visité par le passé en contexte québécois. Les résultats fourniront aux organismes de soutien ainsi qu'aux employeurs des outils permettant de mieux aiguiller, accueillir et accompagner les vétérans dans leur transition professionnelle et à la vie civile.

Conclusions: À venir à l'été 2022.

1C05: The Roots of Homelessness in Female Veterans - A review of the literature

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Brief Description: Female Canadian Veterans have been found to be at an increased risk of homelessness when compared to their male counterparts. Female Veterans make up between 10 to 15 percent of all Veterans, while 30 percent of all homeless Veterans are female. This overrepresentation of females in the homeless Veteran population suggests that there is a need to better understand the factors leading to increased risks of homelessness among this population in Canada. We have completed a scoping review of the peer-review literature published between January 2000 and September 2021 to identify the 1) extent of the literature on homeless female Veterans, and 2) factors associated with female Veteran homelessness. The purpose of this presentation is to report the results from the scoping review.

Patient Population: A modified version of the Arksey and

O'Malley framework for scoping reviews was used to conduct the review. The review of the literature was performed in MEDLINE, CINAHL, and Web of Science for literature focusing on the risk factors associated with homelessness among female Veterans. A critical appraisal of studies was performed to determine the quality of the evidence presented in the studies included in the data synthesis.

Results: 927 studies were retrieved from the three databases searched. Nine articles were added manually from additional sources. 852 articles were screened after duplicates were removed. After screening, fifteen studies were included for analysis. This included five cross-sectional studies, five cohort studies, and five studies of qualitative design. All studies identified for inclusion were from studies conducted on the American homeless female population. Results from the data synthesis indicated that the factors that contribute to homelessness are multi-dimensional and can include different stages of life, employment characteristics, racism, substance abuse, military sexual trauma mental health issues, perceived lack of support, difficulties transitioning to civilian life, and traumatic experiences pre/post and during military deployment.

Conclusions: Results from the scoping review have been used to design a study to explore and describe the experiences of homeless Canadian female Veterans. We have received funding from the Social Sciences and Humanities Research Council to support this study. Unlike the methodologies employed in the peer reviewed literature, we have incorporated into the design of our study a consideration regarding the multiple intersections of identity that influence the singular multidimensional lived experience of individuals.

4D05: Identification and Description of Multi-axis Profiles of Veterans with Chronic Pain Using Latent Class Analysis

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Introduction: Chronic pain is a major challenge for Veterans and serving military, but there is limited research on the unique issues and needs in this population. Future treatment programs should be inclusive and target specific subgroups where differences in needs and responses are known.

The objective of this study is to assess the physical and psychological characteristics of Veterans and serving military living with chronic pain and determine if there are factors that could potentially be the focus of future treatment programs.

Methods: Canadian Veterans and serving military were recruited to participate in an online survey (data collection still in progress). The online survey comprised of demographic questions (e.g., military duty status, rank, years of service, sex,

gender, age), traumatic exposures, and standardized measures on physical health (e.g., Brief Pain Inventory, Multi-Dimensional Symptom Scale, Self-Administered Leeds Assessment of Neuropathic Symptoms and Signs) and mental health (e.g., Patient Health Questionnaire-4, Brief Pain Catastrophizing Scale). We sampled over 300 participants and conducted targeted recruitment to ensure adequate representation of women.

The self-report data will be entered into maximum likelihood-based latent profile analysis (MLE-LPA) to identify meaningful 'clusters', or profiles, of respondents that can be described by the data. Indicators across each of 7 multi-axis pain domains will be used, with iterative reduction / removal of non-discriminating variables to arrive at the most parsimonious solution for describing the emergent clusters.

Expected Results: Preliminary Findings: To date, 259 Veterans and serving military have responded to at least 33% of the survey. The sample is over-represented by white males limiting ability to conduct meaningful subgroup analyses. The MLE-LPA procedure has revealed a 5-cluster solution that can be best described as: Mild impairment (21%), Emotion-dominant pain (10%), Neuro-dominant pain (37%), Multi-axis Complex Mood-dominant pain (17%), and Multi-axis Complex Mood and Neuro-dominant pain (15%). Secondary indicators suggest key differences between the groups in terms of post-traumatic distress and pain distribution.

Conclusions: The results to date, on a sample dominated by white male Veterans and serving military, indicate that meaningful clusters, or profiles, of Canadian Veterans and serving military with chronic pain can be identified through a relatively short multi-axis self-report protocol and that people in each cluster can be expected to show differential responses to different intervention approaches (e.g., physical, psychological, and/or social rehabilitation).

4E05: Canadian Servicewomen's Military-to-Civilian Transition

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Introduction: Military-to-civilian transition (MCT) is a complex process that unfolds over time and in sex- and gender specific ways. The purpose of this secondary analysis of data from a longitudinal qualitative study was to better understand military/Veteran women's MCT experiences over time; identify specific challenges and needs of military/Veteran women during MCT; and make recommendations about sex- and gender-specific considerations for programming and services.

Methods: We conducted a secondary, sex- and gender-based analysis of interviews with servicewomen/women Veterans at

three time points: 0-6 months prior to CAF release (T1), 6 to 12 months after CAF release (T2), and 12 to 18 months after CAF release (T3). We interviewed 21 women Veterans at T1, 20 at T2, and 18 at T3.

Results: The vast majority of women in our study had served 20 or more years; most of the women reported a medical release category. Over a third of the women were unpartnered (single, separated, or divorced). Of those married or in a relationship, more than half were or had been partnered with an actively serving or now released/retired military member (i.e., dual service couples). Seventeen of the 21 women identified as parents, many with school-aged children. Two women identified as visible minorities and three women identified as lesbian or bisexual. None of the women in our sample identified as transgender or Indigenous. Women face unique sex- and gender-specific risks and challenges as they prepare to leave the military and transition to civilian life. Our study highlights the following findings: sex- and gender specific health and wellbeing concerns; the importance of a whole health approach that recognizes co-occurring and interconnected physical and mental health challenges, as well as identity, community, and social connection; the surfacing of military workplace-related trauma after release; the unique relationship and family situations that can add gendered caregiver burdens and/or lead to greater risk of social isolation; and women Veterans' concerns about aging and ageism.

Conclusions: Factors combine to slow women's progress through MCT, create new and unexpected health and wellbeing challenges after release, and amplify difficulties in navigating MCT bureaucracy to receive much needed care. The findings indicate the need for VAC, as well as DND/CAF, to provide better screening for sex- and gender-specific women's health and wellbeing issues, identify and educate on known risk factors related to the military occupational hazards and the military's gendered culture, and develop supports tailored to women's unique needs.

6A04: Translocator Protein in Occupational Post-traumatic Stress Disorder: Preliminary findings using the [18F]FEPPA PET radioligand

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Introduction: Posttraumatic stress disorder (PTSD), a psychiatric illness developed in response to experiencing

Poster Presentations

P141: Chronic Pain and Social Identity in Canadian Armed Forces Veterans: Life After Service Studies 2019 Survey*Henighan, Michael, MSc¹; Reyes, Julian, PhD²; Thompson, Jim, MD^{1,2}; King, Will, PhD¹*¹Queen's University; ²Veterans Affairs Canada

Introduction: Identity challenges characterize major life transitions, and chronic pain is relatively common in military Veterans. The association between identity issues and chronic pain in transitioning military personnel therefore is of interest. Although many military members adjust well in military-to-civilian transition, those with chronic pain might experience relatively more identity disruption. Our hypothesis was that weak group identity is more prevalent in Veterans with chronic pain who were adjusting to civilian life.

Methods: Associations between weak group identity, chronic pain, pain severity and pain interference with activity were examined using data from the Life After Service Survey (LASS 2019) of Canadian Armed Forces members released during 1998-2018. Group identity was assessed as sense of belonging to a local community and/or feeling part of a group with shared attitudes and beliefs. Logistic regression analyses were conducted adjusting for socio-demographic, military, satisfaction, perceived social support and health status variables. Differences between men and women were also examined.

Expected Results: Prevalences were weak group identity 49.4%, chronic pain or discomfort 50.2%, moderate or severe pain 39.2%, and some or most activities limited by pain 31.7%. Adjusted odds ratios for weak group identity were 1.7 (95% confidence interval 1.3-2.2) for chronic pain, 2.59 (1.6-4.2) for severe pain, and 3.2 (2.2-4.7) for those reporting most activities limited by pain. Other variables independently associated with weak group identity in all three final models were low perceived social support (AORs 9.7 to 10.0), neither satisfied nor dissatisfied with finances (1.6 to 1.7), dissatisfaction with main activity (1.9 to 2.1) and dissatisfaction with family (2.9 to 2.1). Highest or lowest age (1.6 to 2.5) and being on disability in the prior year (1.7 to 1.7) were also independently associated with weak group identity in the pain and pain severity models.

Conclusions: As expected, there were statistically significant associations between weak group identity and the three chronic pain measures. Possible explanations for the associations and potential implications for programming and services will be explored. The findings suggest that it is important to attend to identity issues in military personnel with chronic pain who are adjusting to post-service life.

or witnessing a traumatic event, is more prevalent in high risk cohorts (e.g., military and first responders) compared to the general population. Researchers are trying to understand the underlying biology to inform effective drug development. Inflammation, and more specifically, the 18 kDa mitochondrial translocator protein (TSPO, a marker of gliosis in neuropsychiatric disease), has been implicated in the pathophysiology of PTSD. To date, two positron emission tomography (PET) studies have investigated brain TSPO. One study reported decreased TSPO in patients diagnosed with PTSD while another study reported increased TSPO in 9/11 first responders reporting PTSD related symptoms. Therefore, more research is required to fully comprehend potential immuno-inflammatory dysregulation in PTSD. Accordingly, the purpose of this study was to utilize PET imaging of the 2nd generation TSPO probe N-acetyl-N-(2-[18F]fluoroethoxybenzyl)-2-phenoxy-5-pyridinamine ([18F]FEPPA) to investigate TSPO binding, an index of TSPO density, in humans with occupational related PTSD.

Methods: TSPO binding was measured with PET and arterial sampling in 17 participants who fulfilled DSM-IV/5 criteria for PTSD and 19 healthy controls (HC). A magnetic resonance image was acquired for delineation of regions of interest (ROIs). A repeated-measures analysis of covariance (ANCOVA) was employed to evaluate group differences within 6 ROIs in the limbic-striatum (prefrontal cortex [PFC], anterior cingulate cortex [ACC], insula, striatum, hippocampus, amygdala), controlling for the TSPO polymorphism (rs6971).

Expected Results: The PTSD (mean age: 45) and HC (mean age: 31) groups did not differ in sex, TSPO polymorphism, ethnicity, body mass index, or years of education ($p > 0.05$); however, the PTSD group was significantly older than the HC group ($p=0.005$). A repeated-measures ANCOVA with TSPO polymorphism as a covariate revealed no significant difference in TSPO binding between PTSD and HC ($F(1,26)=0.220$, $p=0.643$) and there was no evidence for a group x ROI interaction ($F(2.543,66.109)=1.203$, $p=0.313$). A second ANCOVA controlling for TSPO polymorphism and age also demonstrated no main group effect ($F(1,25)=0.672$, $p=0.420$) and no interaction ($F(2.576,64.4)=0.845$, $p=0.460$). TSPO binding in the amygdala was significantly correlated with Beck Depression Inventory Scores ($p=0.023$, $R=0.7$).

Conclusions: The current study investigating TSPO binding, an index of microglia status, in a cohort of patients with occupational related PTSD did not replicate the recent finding of decreased TSPO in this trauma and stressor related disorder. This finding highlights the importance of characterising the type of trauma in study samples.

P142: Creating New Insights Into How Chronic Pain is Talked About and Understood Within Romantic Couples. Findings from a pilot study

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¹Veterans and Families Institute

Introduction: The purpose of this research is to explore how chronic pain is both discussed and understood within military veteran couples. By combining innovative arts-based approaches to inform unstructured interviews with 10 veteran couples, the project aims to provide in-depth phenomenological understanding of the communication and management of chronic pain within military veteran romantic couples. The purpose of the research is to identify how the experience of chronic pain is described by veterans to their partner, to analyse how the pain of a loved one is understood by the partner, and to explore how understandings of pain shape the care relationship within couples.

Methods: To achieve these aims, veterans with chronic pain, and their romantic partner, were invited to freehand drawings of their experiences of their pain. These drawings are then used as the base for separate unstructured interviews with the veterans and partners to explore the different life worlds of that pain experience. The drawings of pain and corresponding interview transcripts were analysed using compositional analysis to explore the felt-sense, aesthetic aspects of language, and visual imagery (Boden and Eatough, 2014).

Expected Results: Preliminary findings indicate that drawings of pain communicate pain differently than words alone, in interpreting pain through words, that the depth of meaning that attributes a deeper understanding of pain experience is lost when compared to explanations drawings of pain; that bouts of extreme disruptive pain are communicated, explored and thought about at more depth than enduring low level chronic pain; that enduring low level chronic pain becomes assimilated as part of life, however it is this pain that is more likely to affect mood, activity and sleep; and that the social context within which the pain is lived is under-recognised in pain assessment/management.

Conclusions: The findings of this pilot so far suggest that using innovative phenomenological methodology enables differing insights into daily living the experience of chronic pain within their social contexts. This research will continue to apply this methodology and analysis to develop and share differing insights to complement medical methods of assessing pain. This in turn will provide health practitioners and veterans' charities with insights into how chronic pain can be understood and assessed, beyond the medical verbal assessment of the veteran, which will be important to the development of personalised pain management programmes.

P150: Understanding the Experiences of Canadian Military Veterans Participating in Aquatic Therapy for Lower Extremity Musculoskeletal Pain: An interpretive phenomenology study

Held, Nicholas, PhD¹; Miller, Jordan, PhD¹; Cramm, Heidi, PhD¹

¹Queen's University

Introduction: It has been reported that 41 percent of Veterans experience constant pain or discomfort, which is close to double the 22 percent reported by the Canadian population¹. Aquatic therapy is a possible treatment option that may improve outcomes in military Veterans with chronic pain. To date, there have been eight small randomized clinical trials comparing aquatic exercise to land-based exercise on function or disability for people with lower extremity musculoskeletal pain^{2,3}. However, further research on the experiences and perspectives of participants is needed. Most importantly, no studies on the experiences of aquatic therapy among Canadian military Veterans living with pain have been conducted. Given the unique needs of this population, evidence specific to this group is needed in order to inform service delivery.

Methods: Canadian military Veterans that live with lower-extremity musculoskeletal chronic pain (>12 weeks) are being recruited for this study. A purposeful sample of 10-15 Canadian military Veterans who have experience using the aquatic therapy pools at Hydrathletics will be included. Purposeful sampling will be used to ensure both sexes are represented. Semi-structured interviews are being conducted with eligible participants. The semi-structured interview guide has a series of prompts and probes around issues related to identity, belonging, pain, and various psychosocial dimensions. The primary objective of this study is to develop an understanding of the lived experiences and influence that aquatic therapy has on the physical, social, and mental-wellbeing, and quality of life of military Veterans.

Expected Results: Data analysis will proceed simultaneously with data management. NVivo, a qualitative analysis software program, will be used to support data management of the coding and analytical process. Reflexive practices and team debriefing will be used to enhance the rigour of the analysis.

Conclusions: Qualitative research is relatively underutilized in physical therapy⁴ and pain research⁵. Our aim is to provide a multidimensional understanding of a Veteran's experience in aquatic therapy that goes beyond traditional physical improvements to create a more informed practice. Gaining insight into the positive and negative lived experiences from clients will lead to improved Veteran care by offering insight into strategies that may improve the experience of Veterans participating in aquatic therapy.

P153: 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 high amount of healthcare costs and utilization. High users among Canadian Armed Forces (CAF) Veterans were examined using Veterans Affairs Canada (VAC) health expenditures, but data on this topic are limited among provincial healthcare systems. This study examined the well-being and health services utilization characteristics associated with being a high user of primary care services among CAF Veterans.

Methods: Analysis was conducted on the 2016 Life After Service Survey, a nationally representative survey of over 56,000 CAF Regular Force Veterans containing self-reported data on health, the social determinants of health, and health services utilization. Characteristics of high users of primary care services, measured as 10 or more self-reported family doctor visits in the previous 12 months, were compared with the rest of the sample, the non-high user group. Independent variables were selected from the following domains from VAC's Well-being Conceptual Framework: health, finances, employment or other meaningful activity, life skills and preparedness, and social integration. Initially, descriptive statistics and bivariate logistic regression were conducted. Subsequently, backward elimination multiple logistic regression modeling identified the most significant well-being indicators associated with being a high user of primary care. Results were reported as odds ratios with 95 percent confidence intervals.

Results: Bivariate analysis revealed that being a high user was significantly associated with many demographic, military, and well-being indicators. After adjusting for the confounding influence of many significant indicators, multivariate analysis revealed that the most significant indicators associated with being a high user were being female, having poor physical and mental health, being dissatisfied with one's main activity in life, and being in the middle of the income distribution. High users of primary care were also more likely to use other healthcare services such as specialist physicians, mental health professionals, hospitals, and home care.

Conclusions: Veterans who were high users of primary care were doing worse off in many domains of well-being and more likely to use other health services, indicating that they are having a large impact on the healthcare system as a whole. In addition to informing future research in this area, these findings provide evidence for anyone working to improve the health and well-being of Canadian Veterans while reducing their healthcare costs and utilization.

P156: Lessons Learned from Presumptive Condition Lists in Veteran Compensation Systems

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Introduction: An individual's military service may include a range of occupational circumstances and hazards with subsequent impacts on health. Some veteran benefits systems have established presumptive condition lists, which formally accept a connection between specified military factors and health conditions. To inform other administrations considering such tools, Veterans Affairs Canada conducted an international review of veteran presumptive condition lists (conditions included and military exposure criteria) along with the scientific procedures used to inform them.

Methods: An environmental scan was conducted across four veterans' compensation systems, representing English speaking countries with a range of population sizes and geographic locations: The United States of America (US), The United Kingdom (UK), Australia (AU), and New Zealand (NZ). The scope of the scan was delineated by the following terms: "veteran presumptive conditions", "veteran compensation", "veteran health", and "occupational conditions veterans". Enabling statutes and downstream policy instruments were searched and retrieved through official websites of the organization with responsibility for (or oversight of) veterans' benefits. Where a piece of legislation, regulation or policy appeared to be relevant to the scan, information on conditions included, eligibility criteria, and scientific review (undertaken for the determination of conditions and eligibility criteria) was extracted and recorded.

Results: The content of presumptive condition lists across jurisdictions varies by the types of conditions included as well as by military eligibility requirements (e.g., service in a particular conflict, context, or time period). Cancers are the most widely presumptively covered types of conditions across the countries examined, particularly in relation to Vietnam War service. Mental health conditions are also included in most presumptive lists, with the exception of the UK. Skin conditions are widely covered, with AU addressing a wider range of such conditions. The US and AU outline the greatest number of conditions/condition groupings, with differing exposure criteria and limits. Presumptive condition lists in all countries were developed using a scientific review process to examine available evidence.

Conclusions: This environmental scan of veteran presumptive condition lists across four countries identified a range of

health conditions covered, military requirements for eligibility, and underlying scientific review processes. Opportunities to leverage evidence and experience across veteran, as well as civilian, benefits and compensation systems should be considered, particularly during list development and claims submission processes. Ongoing research to clarify links between exposures and health outcomes in military populations is also recommended.

P157: The Adjudication of Sexual Dysfunction Claims Consequential to an Entitled Psychiatric Condition

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Program/Intervention Description: In 2018, Veterans Affairs Canada (VAC) changed its decision-making processes by issuing a directive that streamlined erectile dysfunction disability benefits claims that are related to a psychiatric condition. VAC did not create a similar directive for any other sexual dysfunction claims, including those made by female clients. As part of our focus on identifying possible barriers to equitable access to programs and services for women Veterans, the Office of the Veterans Ombud (OVO) investigated whether there is a sex-based bias in VAC decision-making processes for sexual dysfunctions related to psychiatric conditions.

Evaluation Methods: Our primary research question was, “Is there sex-based bias in VAC adjudication processes for sexual dysfunction consequential to entitled psychiatric conditions?” To answer this question, we consulted with VAC officials and analyzed VAC adjudication instruments and processes, current academic literature, VAC and OVO client data, and Veterans Review and Appeal Board (VRAB) cases related to sexual dysfunction. Our analysis focuses on the adjudication processes in place as of November 2021

Results: Our review found systemic unfairness for female Veterans created by four decision-making processes. We also found serious limitations in the availability of accurate VAC client data. These limitations made it impossible for us to measure the impact of the systemic sex-based biases we uncovered. This report delivers five recommendations to address the issues we found. Overall, our recommendations are focused on resolving systemic sex-based biases in the processes used by VAC to adjudicate claims for sexual dysfunctions related to psychiatric conditions and improving data collection and dissemination. Amending these processes could assist decision-makers to ensure clients with sexual dysfunctions other than erectile dysfunction are not waiting longer or experiencing unfair outcomes.

Conclusions: Our analysis uncovered five fairness issues with the instruments VAC uses to adjudicate sexual dysfunction claims consequential to an entitled psychiatric condition, including limited VAC client data, which reveal a sex-based

bias. Unfortunately, we could not ascertain how female clients may be affected by the sex-based biases we found because of serious issues with VAC data collection and reporting. Our recommendations point to the need for VAC to update its adjudication instruments so that all clients experiencing sexual dysfunction conditions related to an entitled psychiatric condition are treated fairly. Female Veterans with a service-related sexual dysfunction should not have to wait longer or experience an unfair outcome simply because of their sex.

P162: Peer Support Activities for Veterans, Serving Members, and their Families: Results of a scoping review

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Introduction: Peer support, or support between individuals with a similar lived or living experience, has been utilized for many years in various populations, including Veterans, Serving Members, and their Families. Ambiguity still, however, exists in the literature regarding the categorization of peer support activities, their outcomes, and how they can be used to improve the well-being of individuals. Guided by the seven domains of well-being in the Canadian Veteran framework, activities were catalogued according to activity, population and peer characteristics, and categorized by associated domains of well-being. This scoping review intends to clarify and present the current state of international peer support literature for Veterans, Serving Members, and their Families and lay the foundation for future research on peer support in the Canadian Veteran context.

Methods: A scoping review following the five stages outlined by Arksey and O’Malley was conducted; guided by the question: “What is currently known about evaluated peer support activities for Veterans, Serving Members, and their Families?”

Results: 103 publications from 6 different countries were included in this review and catalogued based on publication demographics, participant information, peer support activity information, and peer information.

Conclusions: This scoping review identified 103 publications, demonstrating the breadth of evaluated peer support activities available in these populations. Peer support activities have the potential to positively influence the well-being of Veterans, Serving Members, and their Families on a holistic level across domains. Categorizing outcomes by well-being domain, this study found that peer support activities have the potential to positively influence the well-being of Veterans, Serving Members, and their Families on a holistic level across

domains. The wide scope of this review allowed the authors to identify the myriad of components currently being utilized and evaluated in the delivery of support from peers to Veterans, Serving Members, and their Families.

In conclusion, despite some limitations, this scoping review provides an important foundation for future research related to peer support in Canadian Veterans, Serving Members, and their Families. Utilizing a consultative approach with an advisory group of varied expertise, this review is a step to standardizing the peer support vocabulary, as well as the way these activities are designed, evaluated and presented in the Canadian context.

P164: Preventing Poor Post-retirement Outcomes among Canadian Armed Forces Veterans: Factors explaining perceived involuntary retirement

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Introduction: Unlike other organizations, the Canadian military has no duty to accommodate disability and retains a mandatory retirement age, long since eliminated for most occupations in Canada. Therefore, each year about one in three military members is released from the forces for other reasons often categorized as involuntary. The timing and conditions of such retirements may leave many feeling that they have been forced from their working lives. Further, while many Veterans find bridge employment after release from the military, the higher prevalence of disability among Veterans has the potential to lead to untimely retirement from the labour force. As agency over the retirement process is critical to retirement outcomes, perceived involuntary retirement has been found to lead to poor outcomes for retirees such as reductions in life satisfaction in older age, difficulties in adjusting to retirement, depression, and adoption of unhealthy lifestyles such as problematic drinking. However, while factors explaining perceived involuntary retirement have been examined among Canadians, the conditions of work and retirement are unique for military Veterans, and therefore these factors likely differ for Veterans. Therefore, it is essential to examine the factors explaining perceived involuntary retirement among Veterans to inform prevention efforts and mitigate poor outcomes.

Methods: We examined the factors explaining involuntary retirement among Veterans using baseline (2011-2014) data from the Canadian Longitudinal Study on Aging (CLSA). Our study population of Canadian Armed Forces Veterans (n=1,101) was derived from the Tracking cohort of 21,241 participants, aged 45 to 85 at baseline, as it includes a question on retirement voluntariness. Descriptive and multivariable logistic regression analysis will be conducted for male (n=1,003) and female (n=98) Veterans separately.

Expected Results: Over one quarter (26%) of Veterans perceived their retirement to be involuntary. Men had a higher prevalence of perceived involuntary retirement (27%) compared to women (16%).

Conclusions: The role of demographic, human resources and finances, work, and retirement context factors such as age at retirement and reasons for retirement in explaining perceived involuntary retirement will be examined. Further, implications for policy and practice will be discussed.

P165: Improving Veteran's Well-being in their Transition to Thrive: A Canadian Veteran informed framework to evaluate resiliency in peer support, health coaching and self-management programming

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Introduction: The impact of chronic pain among Canadian veterans and their families is significant. Resiliency, the ability to negotiate and navigate for needs in a meaningful way, has been identified as an important component for both transitioning and pain management. This study aims to critically review the evidence for the effectiveness of guided peer support, health coaching and self-management programs for veterans through the lens of resiliency, to identify characteristics of successful models, and contribute towards developing an evaluation framework informed by veteran voices to gauge patterns of resiliency and gaps in available interventions.

Methods: Data will be retrieved using both an environmental scan of grey literature and a systematic review using PRISMA guidelines. Search strategy including key words were reviewed by a medical librarian and a veteran with lived experience. Articles were reviewed by 2 reviewers to determine inclusion or exclusion based on established criteria. All studies included at least one, or a combination of, peer support, health coaching and self-management that evaluated at least one of the 8 identified wellness domains: employment, financial security, health, life skills/preparedness, social integration, housing/physical environment, cultural/social environment, and identity. An online survey and focus groups will be used to collect additional feedback from veterans and those in active service that experience chronic pain. Specifically, participants will be asked to express which evidence-based values and resources that amplify resilience are most meaningful to them in terms of navigating and negotiating for their chronic pain management needs.

Expected Results: Interim results from the systematic review include 25 eligible studies showing limited Canadian evidence with the health domain as the most frequently

investigated. Most studies are based in urban areas with the study populations dominated by men. Early environmental scan results showed although many peer support programs exist, few offer specific support to veterans. Pilot testing of the survey has been completed with 9 veterans between the ages of 35-74. Access to mental/physical health care, accountability, access to recreational facilities/outdoor space, and education/training were identified as highly important in resilience.

Conclusions: Interim results suggest resilience elements that were identified as meaningful by Canadian veterans can overlap with the characteristics found in peer support, health coaching and self-management programs, such as health domain outcomes. Next steps will further explore program characteristics and features to inform design for enhanced support for veterans.

P166: Working Together to Improve Veteran's Well-being Living with Chronic Pain: Veteran engagement in the Resilient Valor study

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Brief Description: In recognition of the value of lived experience perspectives, conducting research with 'patient partners' has not only become more common, but is moving to being a requirement for many funders. The fields of chronic pain and veterans' health are no exception, and this is reflected in our collective work. This symposium will provide an overview of two research projects for veterans with chronic pain, addressing the topics of peer support and education-based self-management strategies. Our veteran partner will address the identity and culture differences for working effectively with veterans and their families and other people with lived experience (PWLE), building on work from the Chronic Pain Centre of Excellence for Canadian Veterans, Chronic Pain Network and Canadian Institute for Musculoskeletal Health and Arthritis research.

For part 1, we will discuss the benefits, limitations, and opportunities, resulting research outcomes, and knowledge mobilization through different modalities of engagement in the Resilient Valor study.

Patient Population: We will focus on our experience with working alongside Canadians veterans with chronic pain and those who are currently serving in Canadian Forces. Specifically investigating research related to peer support, health coaching and self-management interventions.

Results: To ensure our research was appropriate and would be impactful for Canadian veterans we invited a Canadian veteran with experience in a Canadian health coaching program to join our project team. The insights gained, an understanding of veteran culture and identity, access to a pool

of Canadian veterans to pilot test the survey developed and resources provided for the environmental scan were invaluable contributions projected by the veteran who joined our team.

From our project's inception we aimed to anchor our research on veteran informed work, as such our systematic review, on outcomes that reflect the seven domains of well-being as described by Veterans Affairs Canada. Upon receiving veteran input, we also added another domain, identity, to reflect the transitional journey veterans make back to civilian life and civilian care.

Insights and assistance in the systematic review were also provided by a student which Cadets experience and relationships were made with a number of organizations that support veterans to help develop recruitment strategies.

Nine Canadian veterans also helped co-develop the survey used to engage Canadian voices, providing feedback on language used and user experience.

Conclusions: Partnering with veterans with lived experience throughout the development process and project preparations has fostered the creation of a more approachable and inclusive pathway for veteran engagement.

P170: Mental health of Canadian Veterans of the Reserve Force

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Introduction: There is a paucity of scientific literature related to mental health, specifically in the Reserve Force in Canada, and to how population attributes may be related to their mental health. The objective of this research was to explore the association between demographic and service characteristics and mental health in Canadian Veterans of the Reserve Force

Methods: Participants of this research were part of the 2013 Life After Service Studies that included a sample of Veterans of the Reserve Force Class C (n = 905) and Reserve Force Class A/B (n = 465). Bivariate and multivariate analyses were carried out incorporating survey design to assess the association of 24 demographic and service variables on the Mental Component Score (MCS) for each group. Two multivariate linear models were produced with a different number of variables related with MCS.

Results: The bivariate linear regression models showed that for Class C, the following variables were associated with MCS: marital status, age, sex, education, arthritis, having back problems, daily smoking, pain, depression, anxiety, PTSD, rank, and release type. For Class A/B model, age, sex, back, depression, anxiety, PTSD, and release type were significantly

associated with MCS. The multivariate model for Reserve Force Class C, showed that seven variables remained significant (marital status, age, pain, depression, anxiety, PTSD, and type of release. Being single decreased the MCS by 3.4 points when compared with being married. Age was significant ($P = 0.002$), and age over 60 increased MCS by 2.7 points ($P = 0.032$). Chronic pain decreased MCS by 2.5 points ($P = 0.003$), depression decreased MCS by 11.5 points, and, similarly,

reporting anxiety and PTSD.

Conclusions: This study provides quantitative evidence about the mental health functioning of Veterans of the Reserve Force and provides more insights into the demographic and physical characteristics that could affect their MCS and can be used to indicate Reserve Force Veterans that may require more mental health assistance.

OTHER / AUTRES



PRIMARILY PHYSICAL HEALTH & WELL-BEING

Podium Presentations

2E02: Randomized Trials of Therapeutic Heparin for COVID-19: A meta-analysis

Sholzberg, Michelle, MDCM, et al.^{1, 2, 3, 4}

¹ St Michael's Hospital; ²Li Ka Shing Knowledge Institute; ³University of Toronto; ⁴RAPID Trial Investigators

Introduction: Pulmonary endothelial injury and microcirculatory thromboses likely contribute to hypoxemic respiratory failure, the most common cause of death, in patients with COVID-19. Randomized controlled trials (RCTs) suggest differences in the effect of therapeutic heparin between moderately and severely ill patients with COVID-19. We did a systematic review and meta-analysis of RCTs to determine the effects of therapeutic heparin in hospitalized patients with COVID-19.

Methods: We searched PubMed, Embase, Web of Science, medRxiv, and medical conference proceedings for RCTs comparing therapeutic heparin with usual care, excluding trials that used oral anticoagulation or intermediate doses of heparin in the experimental arm. Mantel-Haenszel fixed-effect meta-analysis was used to combine odds ratios (ORs).

Results: There were 3 RCTs that compared therapeutic heparin to lower doses of heparin in 2854 moderately ill ward patients, and 3 RCTs in 1191 severely ill patients receiving critical care. In moderately ill patients, there was a nonsignificant reduction in all-cause death (OR, 0.76; 95% CI, 0.57-1.02), but significant reductions in the composite of death or invasive mechanical ventilation (OR, 0.77; 95% CI, 0.60-0.98), and death or any thrombotic event (OR, 0.58; 95% CI, 0.45-0.77). Organ support-free days alive (OR, 1.29; 95% CI, 1.07-1.57) were significantly increased with therapeutic heparin. There was a nonsignificant increase in major bleeding. In severely ill patients, there was no evidence for benefit of therapeutic heparin, with significant treatment-by-subgroup interactions with illness severity for all-cause death ($P = .034$).

Conclusions: In conclusion, therapeutic heparin is beneficial in moderately ill patients but not in severely ill patients hospitalized with COVID-19.

2E03: Effectiveness of Therapeutic Heparin Versus Prophylactic Heparin in Moderately Ill Patients with COVID-19 Admitted to Hospital: RAPID randomised clinical trial

Sholzberg, Michelle, MDCM, et al.^{1, 2, 3, 4}

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Introduction: Heparin, in addition to its anticoagulant properties, has anti-inflammatory and potential anti-viral effects, and may improve endothelial function in patients with COVID-19. Early initiation of therapeutic heparin could decrease the thrombo-inflammatory process, and reduce the risk of critical illness or death.

Methods: We randomly assigned moderately ill hospitalized ward patients admitted for Covid-19 with elevated D-dimer level to therapeutic or prophylactic heparin. The primary outcome was a composite of death, invasive mechanical ventilation, non-invasive mechanical ventilation or ICU admission. Safety outcomes included major bleeding. Analysis was by intention-to-treat.

Results: The mean age of participants was 60 years; 264 (56.8%) were men and the mean body mass index was 30.3 kg/m². At 28 days, the primary composite outcome had occurred in 37/228 patients (16.2%) assigned to therapeutic heparin and 52/237 (21.9%) assigned to prophylactic heparin (odds ratio 0.69, 95% confidence interval 0.43 to 1.10; $P=0.12$). Deaths occurred in four patients (1.8%) assigned to therapeutic heparin and 18 patients (7.6%) assigned to prophylactic heparin (0.22, 0.07 to 0.65; $P=0.006$). The composite of all cause death or any mechanical ventilation occurred in 23 patients (10.1%) assigned to therapeutic heparin and 38 (16.0%) assigned to prophylactic heparin (0.59, 0.34 to 1.02; $P=0.06$). Venous thromboembolism occurred in two patients (0.9%) assigned to therapeutic heparin and six (2.5%) assigned to prophylactic heparin (0.34, 0.07 to 1.71; $P=0.19$). Major bleeding occurred in two patients (0.9%) assigned to therapeutic heparin and four (1.7%) assigned to prophylactic heparin (0.52, 0.09 to 2.85; $P=0.69$).

Conclusions: In moderately ill patients with covid-19 and increased D-dimer levels admitted to hospital wards, therapeutic heparin was not significantly associated with a reduction in the primary outcome but the odds of death at 28 days was decreased. The risk of major bleeding appeared low in this trial.

Poster Presentations

P171: RICOVID Trial at St. Michael's Hospital, Toronto, ON: Remote Ischemic Conditioning as an Adjunct Therapy in COVID-19 ICU patients - A randomized controlled pilot trial

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¹St. Michael's Hospital; ²Li Ka Shing Knowledge Institute; ³University of Cambridge; ⁴Defence Research and Development Canada

Introduction: This research aims to assess the use of an experimental and non-invasive procedure, Remote Ischemic Conditioning (RIC), as an adjunct therapy in severe COVID-19 disease. An excessive and counterproductive systemic inflammatory response is a major cause of severe disease and death in patients with COVID-19. Severe ICU cases frequently have higher levels of inflammatory markers, which are thought to be positively correlated with disease severity. RIC may protect organs against reduced blood flow and reduce exaggerated immune response seen in severe COVID-19 disease.

Methods: This trial will be enrolling 30 ICU patients at St. Michael's Hospital in Toronto, Canada. Eligible patients with severe COVID-19 disease will be randomized to undergo RIC versus sham-RIC. Interventions will be applied to one of the extremities calibrated to induce four, ten-minute cycles of five-minutes-ischemia and five-minutes-perfusion for a total of 20 cumulative minutes of limb ischemia at a pressure of 250 mmHg. Interventions will be performed within 72 hours upon admission of a confirmed COVID-positive patients. The procedure will be performed every 72 hours upon randomization +/- 1 hour to accommodate caveats in performing the procedure at that time. Blood is collected at 0- and 6-hours to assess RIC on biomarkers of inflammation and coagulation.

Expected Results: Prior research has shown that RIC may reduce biomarkers associated with severe COVID-19 disease such as Interleukin-6 (IL-6) and C-reactive protein (CRP), thus we propose that RIC could provide benefit to the COVID-19 patients by suppressing cytokine storm.

Conclusions: With the evolving COVID-19 pandemic, intensive care units are at risk of becoming overwhelmed; thus, there is a need for safe, rapid, and effective treatments. RIC is known to be a safe procedure that may attenuate immunopathological processes in severe COVID-19 disease. If effective, it may help ameliorate need for costly and extensive care. This is the first study to assess this non-invasive procedure as an adjunctive therapy in severe/critical COVID-19 and may potentially be expanded into a wide range-of-use cases. Results from this study may also inspire further work of national interest. For example, in the field of battlefield medicine, results of the biomarker analysis may shed light on whether the intervention may be a useful treatment for conditions such as hemorrhagic shock. The proposed intervention is also easily employed, requires no specialized training, and can be performed with any tourniquet-like device, making it a potentially ideal adjunct in environments with precarious access to medical care.

MIXED MENTAL AND PHYSICAL HEALTH & WELL-BEING

Poster Presentations

P143: The Glossary of Terms 3.0: Helping to define the language we use to help others

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Brief Description: The Glossary 3.0 will enhance awareness and understanding of the rationale behind the posttraumatic stress disorder (PTSD) Glossary of Terms, engage leadership, clinicians, scientists, and policymakers via discussion on best practices for knowledge translation and implementation.

Patient Population: Our national team has helped to define the language that we all use to help others. Collaborating with the Canadian Institute for Public Safety Research and Treatment (CIPSRT) and the Public Health Agency of Canada (PHAC), the Glossary 3.0 Senior Authors' Team, a diverse, multi-institutional pan-Canadian group of academics and clinicians worked to develop Version 3.0 of the PTSD Glossary of Terms, which will be published in an upcoming Special Issue of the Health Promotion and Chronic Disease Prevention in Canada (HPCDP) Journal as well as be posted on CIPSRT's website.

Results: The Glossary 3.0 replaces the earlier version with some changes in the words presented and some subtracted, some reworded, and some additional submissions. We hope by sharing what we've done and what we are doing we will be able to gather feedback that we will use to make some changes to the Glossary 3.0 or incorporate them into the next version of the Glossary.

Conclusions: This version of the Glossary is almost complete. We look forward to sharing it on a poster and to get feedback regarding its structure, layout, and format. The plan is to further develop a list of terms that are commonly used in discussions particularly of mental health and moral injury, and further develop Glossary 4.0 with what we've learned from Glossary 3.0.