

VANGUARD
SUPPLEMENT

MVHR FORUM 2012



RESEARCH ABSTRACTS

From the 3rd Annual

MILITARY AND VETERAN HEALTH RESEARCH FORUM
NOVEMBER 26-28, 2012 KINGSTON, ONTARIO



CIMVHR

Canadian Institute for Military
and Veteran Health Research

ICRSMV

L'Institut canadien de recherche sur
la santé des militaires et des vétérans



With over 700,000 veterans in Canada and more than 100,000 serving personnel, we have a significant population with unique risks, exposures and experiences that demands new standards of protection, prevention and care for ill and injured military personnel, veterans, and their families. Interest is high among the university community to conduct research in the area of military and veteran health. To successfully do so, coordination and funding are required.

The Canadian Institute for Military and Veteran Health Research (CIMVHR) is an innovative organization that engages existing academic research resources and facilitates the development of new research, research capacity and effective knowledge exchange. The mission of CIMVHR is to optimize the health and well-being of Canadian military personnel, veterans and their families by harnessing and mobilizing the national capacity for high-impact research, knowledge creation and knowledge exchange.

With a network of academic researchers from across Canada, CIMVHR serves as a focal point for more than 25 Canadian universities who have agreed to work together in addressing the health research requirements of the military, veterans and their families. The Institute serves all Canadian stakeholders interested in military and veteran health research and provides a conduit for the academic community, government organizations (e.g., National Defence, Veterans Affairs Canada), and similar international organizations. The CIMVHR research program ensures sustainability through increased public awareness and public-private funding.

CIMVHR activities are guided by the pan-Canadian university consortium of interest. The Institute is governed by a Board of Directors representing stakeholders, along with an Advisory Council that ensures effective links to the beneficiaries, government, industry, and the broader research community. CIMVHR is supported by the Secretariat located in Kingston, Ontario and managed by the founding members of CIMVHR, Queen's University and the Royal Military College of Canada.

For the last 3 years, CIMVHR has been hosting a Military and Veteran Health Research Forum (MVHR Forum) to help health researchers engage

with other researchers and research resources, exchange valuable knowledge, and build new collaborations focused on research endeavours that improve the health and well-being of our Canadian military personnel, veterans and their families. The MVHR Forum 2012, held November 26-28 in Kingston, Ontario, attracted over 500 Canadian researchers, clinicians, military personnel, veterans, industry stakeholders, government representatives and international delegates who joined us to learn and network at Canada's only conference that is dedicated to health research for our military and Veterans.

CIMVHR took advantage of this perfect occasion to also launch its new book: *A Coalition for a New Battlefield: Military and Veteran Health Research*. This second volume in an annual collection consists of selected, peer-reviewed papers based on the content delivered in the MVHR Forum 2011. The book can be downloaded from our CIMVHR website at www.cimvhr.ca.

The CIMVHR team is very excited to announce that the preparation for MVHR Forum 2013 is already well underway. As we always seek to meet all Canadian researchers' needs, we are proud to announce that CIMVHR will be broadening its reach by hosting its MVHR Forum 2013 in Edmonton, Alberta. We hope that you will consider joining us next year to find out the latest research, hear exciting key note speakers and network with important colleagues and friends.

It is with great pleasure that we offer you the summary collection of the abstracts of the research presented at our MVHR Forum 2012. We trust you will find valuable information in the following abstracts written by Canadian researchers covering the fields of mental health, physical health, social health, rehabilitation, transitioning from military life, family health issues, combat casualty care and occupational health.

These presentations are one of the many ways CIMVHR connects with researchers, government stakeholders, and, most importantly, the beneficiaries. We thank you for your interest in Canadian military health research and hope to connect with you at our next Forum.

Sincerely,



Alice B. Aiken CD, PhD
Director, Canadian Institute
for Military and Veteran Health Research



Stéphanie A. H. Bélanger, PhD
Associate Director, Canadian Institute
for Military and Veteran Health Research

University Members

Thank you to our 26 university members who have agreed to work together in addressing the health research requirements of the military, veterans and their families:

Queen's University
Royal Military College of Canada

Dalhousie University
Memorial University
Mount Saint Vincent University
McGill University
McMaster University
The University of British Columbia
Université Laval

Université de Moncton
Université de Montréal
Université de Sherbrooke
University of Alberta
University of Calgary
University of Manitoba
University of New Brunswick
University of Ontario Institute of Technology
University of Ottawa
University of Prince Edward Island

University of Regina
University of Toronto
University of Victoria
University of Waterloo
Ryerson University
Western University
York University

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1. Mental Health Research and Rehabilitation in Active Duty Personnel, Veterans or Families

1. The Institutionalization of Resilience Training in the Canadian Forces

Bailey, S., Guest, K., Blackburn, D. and Lipcsey, M.
Department of National Defence

Brief Description: In the past four years the Canadian Forces has developed and implemented a comprehensive mental health and resilience curriculum tailored to all CF personnel throughout the career and deployment cycles. The strategic vision is to support an organizational culture in which psychological resiliency and fitness are maximized, mental health distress/dysfunction carries no more stigma than physical distress/dysfunction, and in which CF members, leaders and families can work together to involve appropriate resources at the earliest opportunity.

Clinical Outcomes: The training modules target confidence in ability to identify problems and seek appropriate assistance, confidence in ability to use skills to manage stress, attitudes and behaviours regarding help-seeking, and knowledge of skills and resources to enhance resilience and support mental well-being.

Patient Population: Canadian Forces personnel at all rank levels, and their families.

2. Risk Factors For Service-Related Mental Disorders Among CF Personnel Deployed in Support of the Mission in Afghanistan: A Survival Analysis

Boulos, D. and Zarmorski, MA
Canadian Forces Health Services Group

Introduction/Objective: Over 40,000 CF personnel deployed in support of the mission in Afghanistan. Earlier research estimated the cumulative incidence of diagnosed Afghanistan-related Mental Disorders (ARMD) to be 13.5% over an average of four years of follow-up. Univariate risk factors for ARMD included high-threat deployment locations, Army service, and being a non-commissioned member. Cumulative incidence estimates are however sensitive to follow-up duration for time-dependent events such as diagnosed mental disorders. This study extends earlier work with a time-to-event (survival) analysis approach and multivariate modelling to explore risk factors.

Methods: The study cohort consisted of all 30,513 CF personnel who deployed outside of N. America in support of the mission in Afghanistan before 1-January-2009. Clinical diagnoses and the clinician's perception of its relationship to the Afghanistan mission were abstracted from the medical records of a stratified random sample of 2,014 personnel. Cox proportional hazards regression was used to explore the independent association of risk factors with the primary outcome of any diagnosed ARMD.

Results: 13.5% of the cohort was diagnosed with ARMD over a median follow-up of 1,364 days. Visual inspection of survival curves showed them flattening out after seven or more years of follow-up. Cox regression showed that deployment to a higher threat location, non-officer rank, and Army service were independent risk factors for ARMD. The hazard ratio for deployment to Kandahar was 5.6 relative to the United Arab Emirates location. In contrast, sex, component (Regular vs. Reserve Force), having had multiple deployments, and total time deployed were not independent risk factors for ARMD.

Conclusion: An important minority of CF personnel who deployed in support of the mission in Afghanistan have been diagnosed with ARMD. Meaningful numbers of ARMD cases continue to come forward for help for at least seven years after return, meaning the CF must retain a robust diagnostic and treatment capability long after the mission winds down. Identified risk factors likely reflect combat exposure, a known driver of post-combat mental disorders. The main limitation of this analysis is that only CF diagnoses were captured during follow-up.

3. Moral Military and the Virtuous Veteran: How Ethics and Psychology Are Inseparable in Psychological Rehabilitation and Civil Society Reintegration

Brueya, S.
St Paul University

Introduction/Objective: Perhaps unlike the culture of any other broadly representative institution, military culture "fosters an intensely moral and ethical code of conduct" (Litz et al., 2009). For releasing military, what is the impact of rehabilitation programs that fail to account for this strong sense of

morality and ethical conduct? How does civil society cultivate productive agency in rehabilitating military while maximizing their potential when the military and civilian moral codes may be contradictory or absent from civilian life? What are the iatrogenic effects in failing to account for the strong military ethical code and how can these harmful consequences be avoided?

Methods: Clinical work and research into moral injury is relatively new. W.P. Nash, B.T. Litz and J. Shay offer a hopeful foundation to explore stress reactions other than PTSD that by extension highlight potential shortfalls in current psychological rehabilitation models. The work of G. Grant, M. Haynie as well as government and media reports offer evidence that the administration of rehabilitation and compensation models may be counterproductive to the intended goals. Renowned ethicist Alan Gewirth and others provide ethical constructs to minimize harmful consequences.

Results: Research is sparse which reconciles military ethics with an ethical framework for rehabilitation (compare this with ethical practices which are indeed prolific). Nevertheless, harmful consequences resulting from the development and administration of programs are of increasing clinical, ethical and fiscal importance. Literature and research emphasizes the importance of incorporating moral injury and associated prolonged loss/grief models into psychological rehabilitation. "Mutuality" and "productive agency" concepts from Gewirth provide a pragmatic civilian ethical framework complementing deeply ingrained military ethics.

Conclusion: Work into the area of moral injury and prolonged grief offer much insight into resilient difficulties of psychologically reintegrating military into civil society. Fundamentally combining this work with that of ethicists into a rehabilitation program provides a range of viable options that maximize the individual potential and productive agency of psychologically rehabilitating military, while reducing possible iatrogenic effects.

4. Prolonged Exposure: Predictors of Outcome and Barriers to Utilization

Boivin, M., Baillu, A. and Gillis, A.
Royal Ottawa Mental Health Centre

Brief Description: Prolonged Exposure (PE) Therapy is considered one of the gold standard treatments for individuals with PTSD. The central components of this therapy directly address the fear structures developed as a result of military trauma. Despite the evidence for its effectiveness, both clients and clinicians are often reluctant to use PE because it involves exposure to trauma triggers and memories. This paper describes the outcome of PE on global PTSD symptom severity and severity of symptom clusters, predictors of outcome among individuals receiving PE, the sequencing of PE with other clinical interventions, and clinicians' perceptions of barriers to utilizing PE.

Clinical Outcomes: Predictors of clinical outcome in PE will be described, including length of time since trauma, type of trauma, PTSD severity, comorbidity, psychosocial stressors, motivation to change, and emotion regulation ability. Further, although PE was developed as a standalone treatment for PTSD, in clinical practice it is often sequenced with other interventions. The sequencing of PE with other clinical interventions within and outside the OSI clinic will be described. Finally, clinicians' perceptions of the benefits and detriments of PE will be discussed, including determinants of integrating PE into treatment, use of alternative therapies to treat PTSD, and concern about symptom exacerbation.

Patient Population: The Royal Ottawa Operational Stress Injury (OSI) Clinic serves members and veterans of the CF and the RCMP, who have a service-related psychological injury. Since the opening of the clinic in 2009, 472 referrals have been received: 40% from the Pembroke area, and 46% from the Ottawa-Gatineau area. Clients' average age is 48 years (87% male); 70% have a diagnosis of PTSD and 68% of Major Depressive Disorder. Approximately 50 clients have participated in PE through the Ottawa OSI clinic. The data from these interventions has been analyzed and the outcome will be reviewed in this presentation.

5. The Role of the CF Return to Work Program in the Reintegration of Ill and Injured Service Members

Coulthard, J.
Department of National Defence

Introduction/Objective: Research has shown that individuals who return to work as soon as possible following an illness or injury derive therapeutic, psychological, and social benefits, and may actually experience a faster recovery. As such, the goal of the Canadian Forces (CF) Return-to-Work (RTW) Program, a vocational rehabilitation program operating under the

Joint Personnel Support Unit (JPSU), is to help restore the physical and mental health of ill and injured service members through reintegration into the workplace and the progressive resumption of regular duties.

Methods: An exploratory qualitative study was conducted to gain insight into the role of the CF RTW program in helping service members make the transition back to work or from military to civilian life. Semi-structured, in-person interviews were conducted across Canada with ill/injured CF members who are part of the RTW program. Participants were asked about their experiences and perceptions of the RTW program, about their organizational and individual sources of support, and about their knowledge of available programs and services.

Results: The vast majority of ill/injured CF members who participated in the study benefited from their participation in the program and reintegration back to work. In addition, it was found that the social support provided by the program and the RTW Coordinators was a key factor in the well-being of the ill/injured CF members. Results also revealed two key barriers to the effectiveness of the program: CF member delay seeking and accessing treatment after injury or the onset of illness, and a lack of awareness regarding the RTW program and the services available.

Conclusion: This study provides insight into how well the RTW program is facilitating the return to work of CF members who have experienced an illness or injury. It also highlights the positive impact of the RTW program and identifies some potential barriers or challenges associated with their return to work.

6. Pilot-Project on Incarcerated Former Military Personnel in Three Ontario Detention Centres

Côté, I.

Ontario Ministry of Community Safety and Correctional Services

Introduction/Objective: There is limited research on incarcerated former military personnel in Canada. Further, there is no systematic identification of former military personnel at any level of the Canadian criminal justice system. In March 2011, a pilot-project on this population was approved by the Ministry of Community Safety and Correctional Services in three Ontario detention centres. This study's objectives were to determine over a one-year period (April 2011-March 2012) the number and characteristics of incarcerated former military personnel and identify factors associated with veterans' incarceration.

Methods: Inmates reporting a military history volunteered to participate. Demographic variables and military history including number of years in the military, the country for which they served, history of deployment to a war zone and/or involvement in an operational mission, rank, branch of service, time in the Reserves or Regular Force, nature of discharge, and reason for leaving the military were obtained through a semi-structured interview. History of previous incarcerations, treatment of psychiatric problems, drug use and/or alcohol consumption were acquired by reviewing facilities' admission notes. Inmates' current offences were accessed through the Offender Tracking Information System.

Results: The data identified 19 male inmates in three provincial correctional facilities who reported military service. The mean length of service was 5 years. Almost all veteran inmates studied had previous incarcerations. The timing of their first offence relative to their military service varied. Current offences were more serious in those inmates who had no history of deployment, while those who had been deployed were more likely to have received treatment for a psychiatric problem. All reported at least one risk factor for incarceration (e.g. previous incarceration, mental illness, substance abuse).

Conclusion: The incarcerated veterans' offending history could not be attributed solely to their previous military service. However, the nature of their military involvement (e.g. deployment to war zones and/or operational missions) was correlated with indicators of mental illness associated with combat. The latency period between service and incarceration may be difficult to predict. Military history should be part of the intake screening process upon admission to all correctional facilities in Canada to aid custodial personnel in identifying needs and designing appropriate treatment for this population.

7. A Pre-Post Evaluation of a Group Program for Veterans with Military Trauma

Cox, D.W., Westwood, M., Kuhl, D., Hoover, S., and Laidler, T.

The University of British Columbia

Introduction/Objective: Presented is an evaluation of the Veteran's Transition Program (VTP)—a group intervention designed to aid veterans who

experienced military-related trauma. The VTP focuses on psychiatric and interpersonal concerns as well as career transitions. This multimodal group is designed to reduce the effects of trauma exposure via (a) peer support, (b) psychoeducation, (c) emotion regulation skills training, (d) re-enacting the traumatic event, (e) reducing barriers to care, and (f) identifying and working on future goals.

Methods: Veterans were referred to the VTP by word of mouth (e.g., health-care providers) and were screened to ensure that they had a military-related trauma that was negatively impacting their lives. They were excluded if they had active psychotic symptoms, were recently suicidal, would not commit to abstaining from drug and alcohol use during sessions, or could not attend all VTP sessions. Fifty-six veterans enrolled and completed measures of depression, post-traumatic stress symptoms, and self-esteem at the beginning of the first day and at the end of the last day of the VTP. Scores were evaluated for differences from pre- to post-test.

Results: All 56 veterans who enrolled in the VTP completed all phases of the program and the outcome measures. Statistically significant differences ($p < .05$) were found on all measures. Most notably, depression yielded an effect size of 1.22, indicating a large effect of the VTP. Of the twelve scales and subscales analyzed, eight demonstrated medium or large effect sizes ($d \geq 0.8$).

Conclusion: These findings represent initial support for the effectiveness of the VTP for reducing depressive symptoms, post-traumatic stress symptoms, and increasing self-esteem in Canadian Veterans with military-related trauma. Further, of the 56 veterans who attended the VTP, none dropped out of treatment. Drop out is a substantial concern in treatment studies for post-traumatic stress symptoms, thus veterans' willingness to complete the VTP is an important benefit of this program compared to others. These findings encourage further research on the VTP.

8. Evidence of Transferability For Perceptual Cognitive Training to Socially Relevant Abilities in Aging

Faubert, J.

Université de Montréal

Introduction/Objective: Processing complex dynamic scenes such as crowds and traffic is of critical importance. It is well documented that there is an age-related decline in complex perceptual-cognitive processing. It has been suggested that a specific dynamic scene perceptual-cognitive training procedure (3DMOT) helps observers manage socially relevant stimuli such as human body movements. Here, we test this assertion by assessing whether training older observers on 3DMOT can improve biological motion (BM) perception. Research has shown that healthy older adults require more distance in virtual space between themselves and a point-light walker to integrate BM information than younger adults.

Methods: We trained observers between 64 and 73 years of age on the 3D-MOT speed task and looked at BM perception at 4 and 16 m distances in virtual space. We also had a control group trained on a visual task and a third group without training.

Results: The perceptual-cognitive training eliminated the difference in BM perception between 4 and 16 m after only a few weeks, whereas the two control groups showed no transfer.

Conclusion: This demonstrates that 3D-MOT training could be a good process for helping certain observers deal with socially relevant dynamic scenes.

9. Post-Traumatic Stress Disorder and Depressive Symptoms in Relation to Alcohol Use and Alcohol-Related Problems Among Male and Female Canadian Forces Veterans

Fetznier, M.G., Abrams, M.P. and Asmundson, G.J.G.

University of Regina Anxiety and Illness Behaviours Laboratory

Introduction/Objective: Alcohol misuse is common among military veterans affected by post-traumatic stress disorder (PTSD) and depression. Prior research has provided mixed evidence concerning associations among PTSD and depressive symptoms in relation to alcohol misuse. Furthermore, most studies have examined primarily male samples or dichotomously grouped participants as having or not having an alcohol-use disorder. The current study examined the relative contributions of PTSD and depressive symptoms to two aspects of alcohol misuse (i.e., quantity/frequency of alcohol use and alcohol-related problems) while controlling for the number of deployments. These relationships were examined separately for male and female veterans in order to compare the two populations.

Methods: 72 female and 1271 male Canadian Forces veterans completed self-report measures as part of a larger survey of Canadian Forces members.

Results: Between-group t-tests indicated males consumed more alcohol in greater frequency than women; however, alcohol-related problems did not differ between sexes. Multiple regression analyses indicated that, among men, depressive symptoms accounted for significant variance in quantity/frequency of alcohol use, and depressive and PTSD hyperarousal symptoms accounted for significant variance in alcohol-related problems. No depressive or PTSD symptoms accounted for significant variance in quantity/frequency of alcohol use or alcohol-related problems among women.

Conclusion: Findings suggest that, despite increased quantity/frequency of alcohol-use among men, the prevalence of alcohol-related problems did not differ between sexes. Nonetheless, results suggest different maintenance factors at play vis-à-vis alcohol misuse between male and female veterans.

10. Developing a New Instrument to Assess Mental Healthcare Attitudes at the Beginning of the Military Career: Initial Psychometrics

Fikretoglu, D., McCreary, D.R., Blais, A.R., Sullivan-Kwantes, W. and Jobidon, M.E.
Defence Research and Development Canada

Introduction/Objective: Negative attitudes towards mental healthcare can prevent military members with mental disorders from seeking timely, appropriate treatment. Such negative attitudes need to be identified and targeted for change. This is particularly important at the beginning of one's military career, a critical time that provides the opportunity to intervene early and make a lasting impact on people's attitudes. In order to identify, assess, and intervene with mental health care attitudes, a reliable, valid instrument - sensitive to the Canadian Forces (CF) and recruit training contexts - needs to be developed. Here we describe efforts to develop such an instrument.

Methods: Using the Theory of Planned Behavior, we initially conducted qualitative interviews with 84 recruits and officer cadets, asking them open-ended questions on the advantages/disadvantages of using mental healthcare, the approval/disapproval of others for using mental healthcare, and factors that would make it easy/difficult to use mental healthcare. Next we identified common responses to these questions and generated 128 initial items for a new instrument to assess attitudes towards using mental healthcare among CF recruits. The new instrument was then administered to 39 recruits.

Results: We examined descriptive statistics for the items in each construct of the theoretical model. The descriptive statistics revealed that most items were negatively skewed, although the deviation from the normal distribution was not large enough to be of concern. Internal consistency reliability estimates were in the acceptable to excellent range for attitude, perceived behavioral control and intention (.75, .65, and .86) but poor for subjective norms. This led to the refinement of existing items, removal of some problematic items, and addition of new items to increase reliability estimates. The revised instrument is currently being tested for its psychometric properties.

Conclusion: Identifying, assessing, and intervening with mental healthcare attitudes requires the use of reliable, valid instruments. Our research team is testing the validity of a new mental healthcare attitude instrument that was developed to be sensitive to the CF and recruit training contexts. While the initial data are encouraging, more work clearly needs to be done to improve the psychometric properties of this new instrument. Our ultimate goal is to provide CF stakeholders a reliable, valid instrument that can be used to test the efficacy of ongoing interventions to improve mental healthcare attitudes among CF recruits.

11. Identifying Mental Healthcare Attitudes at the Beginning of the Military Career: Implications for Current Mental Health Interventions

Fikretoglu, D., Sullivan-Kwantes, W. and Richards, K.
Defence Research and Development Canada

Introduction/Objective: Fear of being perceived and treated differently (fear of stigma) can be an important barrier to seeking mental healthcare. Other thoughts, expectations, and beliefs around mental healthcare can act as additional attitudinal barriers. Public education interventions to increase mental healthcare-seeking behaviors must identify and target for change such negative attitudes throughout the military career, but especially at the beginning, to intervene early and to lay a good foundation. This project assessed mental healthcare attitudes in the Canadian Forces (CF), at the beginning of the military career, in order to improve current mental health education interventions during this critical time.

Methods: We conducted 84 one-one-one interviews with 48 recruits and 36 officer cadets during week 1 of basic military training. Based on an influential theory (the Theory of Planned Behavior), we asked open-ended questions assessing expectations around the likely outcomes of seeking care, percep-

tions of others' approval/disapproval for seeking care, and beliefs about factors that would make it difficult to seek care for mental illness. Data were analyzed using qualitative analytic strategies.

Results: Recruits/officer cadets see clear advantages to seeking mental healthcare such as having access to professional training/experience/expertise, solving the problem more quickly/efficiently, and feeling better. However, they also see disadvantages such as being seen differently by others, seeing self differently, and negative career impact. Family and friends are seen as approving mental healthcare use; Military peers and immediate superiors are seen as disapproving. Confidentiality, ability to recognize mental health symptoms, and social support are recognized as factors that facilitate seeking care; fear of stigma and discomfort in talking to a professional are seen as impeding seeking care.

Conclusion: These findings have clear implications for current mental health interventions in the CF. First, advantages of seeking mental healthcare should be highlighted/ reinforced in ongoing educational interventions; Similarly, key individuals in CF members' social network who can be potential allies in facilitating care-seeking and factors that are seen as making it easier to seek care should be highlighted. Second, a number concerns around mental healthcare need to be addressed in current interventions. These include negative outcomes of seeking care, disapproval from key individuals in the military social network, and factors that make it difficult to seek care.

12. A Needs Assessment of Psychological Health in Canadian Forces Members on Deployment to Afghanistan: Implications for Service Delivery

Garber, B.G. and Zamorski, M.A.

Canadian Forces Health Services

Introduction/Objective: Data from the US have shown that need for mental health services is widespread during deployment, with up to one-fifth of personnel meeting stringent criteria for an apparent mental disorder. However, each nation faces different operational demands, and each structures its delivery of mental health services differently. The purpose of this study was to explore the need for mental health services in Canadian Forces personnel deployed in Kandahar Province, Afghanistan and to assess how well CF's mental health service delivery model was meeting their needs.

Methods: The study used a cross-sectional survey of all 2,799 CF personnel deployed in Kandahar Province from February to March 2010. Need for mental health care was primarily explored using standard measures for symptoms of acute traumatic stress, depression, and generalized anxiety. Need was also explored by enquiring about having perceived some sort of psychosocial problem during deployment and having perceived occupational impairment due to a psychosocial problem. Care-seeking propensity was assessed by asking about use of medical or non-medical services for psychosocial problems and about current interest in receiving professional help.

Results: The response rate was 57%. Only 8% met civilian criteria for acute traumatic stress, major depression, or generalized anxiety. Of these, only one-quarter had sought care and only one-quarter were interested in getting help. More than half of those with occupational impairment and more than half of those interested in getting help were in the group who did not meet civilian criteria for the three assessed psychological problems. Moreover, one-third of all respondents reported suffering a stress, emotional, alcohol or family problem during the deployment.

Conclusion: An important minority of deployed personnel meet criteria for acute traumatic stress, depression, or generalized anxiety. Prevalence rates in deployed CF personnel are well below those in US personnel; this is likely related to differences in occupational demands (e.g., tour length, combat exposure), along with other factors. Need for care extends well beyond those with an apparent disorder, but actual care-seeking and interest in care are limited. For these reasons, non-clinical interventions have intrinsic appeal on deployment. A deeper understanding of need and barriers to care is needed in order to better meet the psychological needs of deployed personnel.

13. Living With the Loss of Canada's Fallen: a Qualitative Study of Family Members' Experiences Following Military Death

Harrington, C.

Memorial University

Introduction/Objective: This study seeks a deeper understanding of the grief and bereavement experiences of family members of fallen Canadian soldiers; including, family members' perspectives on particular features of

interventions and their perceptions regarding how the context of a military death has shaped their bereavement process.

Methods: A qualitative design was used to facilitate a fuller understanding of the first hand experiences and perspectives of these family members, and the meanings they have created from this experience. This is important given a lack of knowledge and evidence base in this area. Fourteen family members (i.e. parents, adult siblings) participated in in-depth, semi-structured interviews to share their experiences and perspectives. Data is analyzed using thematic and inductive methods; participants are provided opportunity to verify accuracy of emerging themes. This project focused specifically on those deaths related to the Mission in Afghanistan.

Results: The results of this study emphasize: the manner in which family members personally experienced the death; the impacts of ceremony, symbols, public nature of the death and supports on their grief and bereavement; and, the ways in which family members have, following the death, dealt with tension between meanings on a personal level and those meanings in the public arena that are often related to Nationalism and country.

Conclusion: This research will inform death care practice and policy, with particular attention on the unique grief and bereavement experiences and needs following deaths that result from military action.

14. Acute Traumatic Stress is Strongly Associated with Postconcussional Disorder Following Combat-Related Polytrauma

Iverson, G.L., Lange, R.T., and French, L.M.

University of British Columbia and the U.S. Defense and Veterans Brain Injury Center

Introduction/Objective: Combat-related polytrauma is a grim reality of war. After life-threatening injuries are stabilized and treated, service members transition into active rehabilitation. During this initial rehabilitation, greater focus and attention is paid to the potential mental health and cognitive consequences of polytrauma. The purpose of this study is to examine the relation between acute traumatic stress and the postconcussional disorder in US military service members who have sustained combat-related bodily injuries and a mild or moderate traumatic brain injury (TBI).

Methods: Participants were 172 US military service members (Age: M=26.8 years, SD=6.8; Male=96.5%) treated at Walter Reed Army Medical Center following bodily injury and a mild or moderate TBI. All patients were evaluated within the first month post injury (M=11.6, SD=6.6, Range=1-29 days). This is a cross-sectional, descriptive, inception cohort design. Severity of bodily injuries was quantified with a modified version of the Injury Severity Score that excluded intracranial injuries. All patients completed the Neurobehavioral Symptom Inventory (NBSI) and the PTSD Check List-Civilian Version (PCL-C).

Results: There was a strong positive correlation between scores on the PCL-C and the NBSI ($r=.74$). The patients were classified into three groups: acute stress disorder (ASD) present ($n=39$; 22.7%), ASD absent ($n=64$; 37.2%), and ASD subsyndromal ($n=69$; 40.1%). Rates of postconcussional disorder stratified by traumatic stress groups were: ASD Absent=4.7%, ASD subsyndromal=20.3%, and ASD present=59.0%. Service members with ASD were 12.6 times more likely to develop postconcussional disorder than those in the ASD absent group [$X^2(1,103)=37.8$, $p<.0001$; $RR=12.6$, 95% $CI=4.1-50.7$; $OR=29.2$, 95% $CI=7.0-141.2$].

Conclusion: Approximately 23% screened positive for acute stress disorder. Service members with ASD were 12.6 times more likely to develop postconcussional disorder than those who did not have ASD. The results of this study have implications for secondary prevention of the persistent postconcussional disorder. Research is needed to determine if aggressive early treatment of traumatic stress in patients who sustain mild-moderate brain injuries and polytrauma will reduce the future incidence of both postconcussional disorder and PTSD in these service members.

15. Combat-related Post-traumatic Stress Disorder – Examining Long Term Treatment Cost and Mental Health Service Utilization

Joshi, V, Sedge, P., Devlin, J., and Lessard, S.

Department of National Defence

Introduction/Objective: Over the last decade, there has been a significant positive shift in the awareness and understanding of Mental Health (MH)-related injuries among the men and women of the CF. Reduction of stigma, increased prevalence of operationally-related MH injuries and improved access to resources has resulted in an increased demand on MH services. At

present, there is a lack of information concerning the intensity of MH service needs and the associated costs following changes in health seeking behaviour. The goal of this study was to establish the long-term treatment costs of mental health care in the treatment of operationally-induced post-traumatic stress disorder in a cohort of active duty CF members.

Methods: The target population for this study was 750 CF members who deployed to Afghanistan from CFB Gagetown for approximately 6 months in 2007. CFHIS was the primary source of information. The electronic medical files of the cohort were reviewed to identify 159 soldiers previously identified with PTSD (unpublished study). A judgment sample was obtained consisting of all soldiers who were diagnosed with operationally-related PTSD at the Gagetown OTSSC within the first year of return from theatre. The medical files of this sample were examined to obtain patient demographics, documented history of operationally-related adverse psychological outcomes, history of mental health-related medical employment limitations, and detailed service utilization (including psychiatric care, psychotherapy, psychosocial services, case management, hospitalization, prescription psychotropics, and lab services). Utilization costs for the 3-yr study period were determined for each participant using standard cost figures

Results: Preliminary results will be presented and will include the frequencies of mental health service utilization over the 3 yr period of observation and the associated costs based on standardized cost guidelines for these services.

Conclusion: The implications of the establishment of the long-term treatment costs of mental health care in the treatment of operationally-induced post-traumatic stress disorder in a cohort consisting of active duty CF members will be discussed.

16. “Toward final serenity”: A Canadian Veteran’s War Novel

Lukits, S.

Royal Military College of Canada

Introduction/Objective: My research studies the composition and manuscripts of Colin McDougall’s novel *Execution* (1958) to analyze how a Canadian infantry officer transformed his traumatic combat experiences during the Second World War into a therapeutic work of fiction.

Methods: My paper is based on archival research of McDougall’s extensive notes and manuscripts at McGill University, combined with my research and teaching in the fields of war literature and writing therapy.

Results: McDougall composed his novel, based on his combat experience and knowledge of the secret wartime execution of Pt. Harold Pringle, to affirm the value of his infantry service and to help purge himself of the trauma of being a soldier.

Conclusion: From his earliest notes and drafts of the novel, McDougall forced its plot and characters towards what he called a “final serenity” that was necessary to purge and affirm the value of his combat experience. This therapeutic writing process may be used by other war veterans, who may read the book or write their own stories.

17. The Relationship between Job-Related Burnout and Attitudes toward Mental Health Care: Implications for Interventions

McCreary, D.R. and Fikretoglu, D.

Defence Research and Development Canada

Introduction/Objective: High-risk occupations such as the military may lead to job-related burnout. Job-related burnout is a frequently used occupational health psychology construct that addresses the degree to which respondents report characteristics of emotional exhaustion, cynicism, and poor professional efficacy in the workplace. Burnout has been linked with a wide range of individual and organization correlates and outcomes, including increased mental health symptoms. Although the role of burnout in seeking mental healthcare is receiving increasing attention in human service professions (e.g., psychiatry), in the military, the role of burnout in the help-seeking process is still poorly understood.

Methods: Instructors and support staff at a CF training institution ($n=406$) completed an online survey examining job-related burnout and its correlates. Each completed the Maslach Burnout Inventory – General Scale (MBI-GS), a well-validated and commonly used measure of job-related burnout. Respondents also completed open- and closed-ended questions assessing mental healthcare attitudes. One question asked whether respondents would seek help from a mental health professional if they actually had a problem. The mental healthcare questions were all based

on a theoretical model that has been extensively used in health behavior research (Theory of Planned Behavior).

Results: Results of univariate analyses of variance showed that those in the High Emotional Exhaustion category (as opposed to those in the Low and Moderate categories) reported the least likelihood of seeking mental health treatment. In addition, those in the High Cynicism category were less likely to seek treatment compared to those in the Moderate and Low Cynicism groups, and those in the Moderate Cynicism group were less likely to seek treatment than those in the Low Cynicism group. There were no differences in treatment seeking likelihood as a function of Professional Efficacy.

Conclusion: Emotional exhaustion and cynicism, two components of job-related burnout, appear to influence service member's perceptions of their likelihood to seek treatment. This can have potential implications beyond the respondents' own mental health. That is, if CF instructors are to be recruited to either deliver or reinforce mental health education, the question needs to be asked: to what extent does their own degree of job-related burnout impair their ability to deliver a pro-mental health agenda to their students? This is an empirical question that needs to be addressed in future research.

18. The Efficacy of EEG-Neurofeedback for the Treatment of Military Post-traumatic Stress Disorder

McCulloch, J., Beckett, J. and Groll, D.

Queen's University

Introduction/Objective: Operational Stress Injury or military Post-traumatic Stress Disorder is a complex and challenging illness. Soldiers with PTSD struggle to deal with a wide range of symptoms ranging from flashbacks, depression and night terrors, to numbing and emotional isolation. In spite of medical and psychological treatment, many soldiers and veterans continue to experience disabling illness. The use of Neurofeedback training has proven to be a safe, effective and well tolerated treatment. Our clinic has provided treatment for more than 100 Veterans with PTSD. This presentation outlines results achieved through the use of EEG-Neurofeedback.

Methods: The clinic has provided assessment and treatment for Veterans with PTSD since March 2011. During that time over 100 Veterans have done weekly or twice weekly EEG-Neurofeedback. Assessment of clinical response has been carried out by using standard scales such as Beck Depression Inventory, Beck Anxiety Inventory and Post-traumatic Checklist.

Results: Clinical measures show a consistent decrease in symptoms which often begin almost immediately. All symptom clusters of PTSD show statistically significant improvement. The improvements shown on clinical measures translated into functional gains and improvement in quality of life as reported in the clinical interviews that were periodically done during training.

Conclusion: The use of EEG-Neurofeedback has proven to be an effective modality of treatment for Military PTSD/OSI. This treatment is well tolerated and readily accepted by this group. The stigma and shame that may be associated with other treatment methods is absent with EEG-Neurofeedback. The approach is very cost effective and can help increase access to care.

19. Dissemination of Evidence-based Psychotherapy for Military-related PTSD: Symposium Part 1

Roth, M., Monson, C.M., and Shields, N.

Parkwood Hospital Operational Stress Injury Clinic

Brief Description: Evidence-based psychotherapies have been developed to treat Post-traumatic Stress Disorder (PTSD) in both civilian and military populations, including Prolonged Exposure Therapy (PE; Foa, Hembree, & Rothbaum, 2007) and Cognitive Processing Therapy (CPT; Monson et al., 2006). This presentation will provide a brief overview of PE and CPT, as well as a review of the evidence-base for both treatment modalities, and the dissemination efforts within the United States Veterans Affairs system and more recently within the Operational Stress Injury Clinics in Canada. This presentation will also provide a personal overview of PE dissemination, specifically focusing on the training process for becoming a PE therapist and supervisor, and the implementation of PE within the Operational Stress Injury Clinics.

Objective: The learning objectives of this presentation are to understand the evidence-based psychotherapy that has been developed for military-related PTSD, to comprehend the typical dissemination strategies and the dissemination of Prolonged Exposure Therapy and Cognitive Processing Therapy within the United States Veterans Affairs system and the Operational Stress Injury National Network in Canada, and to identify areas of success and limitation in the dissemination of Prolonged Exposure within the Operational

Stress Injury National Network.

Methods: Typical dissemination strategies involve attendance at a workshop and often include post-workshop consultation, which can be provided in a one-on-one and group format with or without digital recordings of the therapy sessions.

Clinical Outcomes: These psychotherapies have been established as effective and efficient psychotherapeutic interventions for reducing PTSD symptomology, as well as reducing the sequelae of comorbid or associated disorders. PE and CPT have been recommended as efficacious treatments by the National Centre for PTSD in the United States, and have been widely disseminated within the United States Veterans Affairs system. More recently, PE and CPT have been disseminated by the Operational Stress Injury National Network within the ten Operational Stress Injury Clinics across Canada.

20. Protective Factors for Mental Disorders in Female Military Service Members: Results from a Representative Survey

Mota, N.P., Medved, M., Whitney, D.L., Hiebert-Murphy, D. and Sareen, J.

University of Manitoba

Introduction/Objective: Mental health promotion initiatives within the military are growing, as is an understanding of several resources that protect against the development of psychological problems. Less is known about protective factors in female service members, as well as how they compare to those in males. The present study aimed to investigate associations of social support, religious attendance, spirituality, and coping with DSM-IV mental disorders in women in the Canadian Community Health Survey: Canadian Forces Supplement (CCHS-CFS, 2002, n=8,441). Potential sex differences in these relationships were also investigated.

Methods: Interviewers asked about religious attendance/spirituality. Coping strategies were also assessed using items from the Ways of Coping Scale, the COPE scale, and the Coping Strategy Indicator. Items were categorized into active coping, avoidance coping, and self-medication based on factor analysis. Social support was assessed with the MOS Social Support Survey. Past year DSM-IV mental disorders were assessed with the World Health Organization Composite International Diagnostic Interview Version 2.1 (WHO-CIDI). Relationships between predictor variables and mental disorders in men and women were studied using logistic regressions adjusted for sociodemographic factors, military variables, and each correlate. For associations that were significant in only one sex, sex-by-correlate interactions were conducted.

Results: In women, inverse relationships were found between social support and major depression, any depression/anxiety disorder, and suicidal ideation (Adjusted odds ratio [AOR] range 0.97-0.98). No associations were found between active coping or religious attendance and mental health outcomes, and spirituality was associated with an increased likelihood of some outcomes. Meanwhile, avoidance coping and self-medication were linked to a higher likelihood of several mental health outcomes (AOR range 1.09-1.55). Only one sex-by-correlate interaction was significant.

Conclusion: The present study found social support to be associated with a lower likelihood of some negative mental health outcomes in women, while other correlates did not show inverse relationships with psychopathology. A similar pattern of findings occurred in men and women. These results could have implications for preparing female service members for deployment as well as developing mental health interventions that are tailored for this population.

21. Everything Changed: Narratives of the Resilience of Female Partners of Male CF Veterans Diagnosed with PTSD

Norris, D. and Pickrell Baker, S.

Mount Saint Vincent University

Introduction/Objective: This study is an extension of previous research undertaken by the researchers focusing on the experiences of female partners of male CF veterans diagnosed with PTSD. Experiences of depression, loss of self, hyper-vigilance, and conscious accommodation complicated by ambiguous loss are key themes emerging from that study. Secondary analysis of the original data has yielded new insight on the relationship between these themes and the capacity of female partners supporting male CF veterans diagnosed with PTSD to be resilient. An critical-ecological model of resilience has evolved from narratives developed through new interviews with eight additional female partners.

Methods: An interpretive/constructivist framework has provided the theo-

retical and methodological foundation for this qualitative study. Intensive interviews guided by a semi-structured interview guide have generated narratives of resilience that focus on key themes emerging from the original study. As a narrative analysis, this study has provided participating women with the opportunity to tell their stories of resilience in their own words unaffected by the concepts and categories prominent in the research on this topic (Clandinin & Connolly, 2000; Riley & Hall, 2005). Interviews were audio-taped, transcribed and then analysed using qualitative data analysis software (MAXQDA). Grounded theory methodology has guided the analysis of the data.

Results: Analysis of the original data and the narratives generated through this phase of the study have facilitated an understanding of the pathways through which ideological forces, regulatory policies, community-level supports, as well as relational and individual processes interact to develop and maintain equilibrium for female partners of male CF veterans diagnosed with PTSD. The interdependencies that exist between the family environments and broader systems as well as the ecological transitions occurring within the families and across their boundaries with other systems are key findings supporting the development of a critical-ecological model of resilience for military families affected by PTSD.

Conclusion: The critical-ecological model of resilience developed through this research is grounded within first-voice narratives of the experiences of female partners of male CF veterans diagnosed with PTSD. It is an extension of previous research conducted by the researchers and builds upon the formative model of military family resilience developed by Norris and Dunn in 2005. The findings of this study and the resulting model have the potential to guide the development of educational programs and support services for family members of CF members and veterans diagnosed with PTSD.

22. An “Anchor” and a “Lifeline”: Trauma and Music in Post-Deployment

Pegley, K.

Queen's University

Abstract: Music has long played an important role in 20th-century wars, from patriotic anthems to big band concerts to protest songs. Two scholars have explored American soldiers' musical practices while serving in Iraq (Gilman, 2008; Pieslak, 2009); these researchers make a series of assertions about which musical genres the soldiers preferred while deployed, and how soldiers utilized music both on and off duty. Beyond this work, however, little has been written on the effects of popular music on deployed soldiers and even less information on how music might be used therapeutically in post-deployment. Early in 2012, I conducted qualitative interviews with retired Canadian soldiers who served in Cyprus, Bosnia, Somalia, and Afghanistan, and asked them about their relationship with music both in theatre and since they have returned. Has their relationship with sound in general changed in any way? Are there any particular sounds that continue to “trigger” them? How is popular music in particular helping them cope in post-deployment? What can their new relationships with this music tell us about their overall ability to reintegrate into society? Although the retirees used very different types of popular music in a myriad of ways, in each instance their music helped “ground” them and provided them with a “lifeline” as they recovered from their trauma. In this presentation I focus on two case studies and discuss what popular music could teach us about their trauma and how it might hold new possibilities for therapeutic intervention in post-deployment.

23. Correlates of Self-Reported Psychiatric Illness and Suicidal Ideation Among Treatment-Seeking Canadian Forces Members and Veterans With Post-Traumatic Stress Disorder

Richardson, D.J., St. Cyr, K., McIntyre-Smith, A., Haslam, D.R.S., Elhai, J.D. and Sareen, J.

St. Joseph's Health Care London

Introduction/Objective: This study examines the association between suicidal ideation and post-traumatic stress disorder (PTSD), major depressive disorder (MDD), generalized anxiety disorder (GAD), and alcohol misuse in a sample of treatment-seeking Canadian Forces (CF) and Royal Canadian Mounted Police (RCMP) members and veterans; and identifies potential predictors of suicidal ideation.

Methods: CF and RCMP members and veterans seeking treatment at the Parkwood Hospital Operational Stress Injury Clinic (n = 250) completed the PRIME-MD Patient Health Questionnaire (PHQ), the Alcohol Use Disorder

Identification Test (AUDIT), and the PTSD Checklist - Military version (PCL-M). Regression analyses were used to determine the respective impact of PTSD and self-reported symptoms of MDD, GAD, and alcohol misuse on suicidal ideation.

Results: PTSD symptom was significantly associated with suicidal ideation ($\beta = 0.412$, $P < 0.001$). However, after controlling for self-reported depressive symptom severity, alcohol misuse severity, and GAD, PTSD severity was no longer significantly associated with suicidal ideation ($\beta = 0.043$, $P = 0.582$).

Conclusion: Although PTSD alone is associated with suicidal ideation, after controlling for common comorbid psychiatric illnesses self-reported depressive symptom severity emerged as the most significant predictor of suicidal ideation. These findings support the importance of screening for comorbidities, particularly a major depressive episode, as potentially modifiable conditions that are strongly related to suicidal ideation in military personal endorsing criteria for PTSD.

24. Dissemination of Evidence-based Psychotherapy for Military-related PTSD: Symposium Part 2

Monson, C.M., Shields, N, and Roth, M.

Parkwood Hospital Operational Stress Injury Clinic

Brief Description: Evidence-based psychotherapies have been developed to treat Post-traumatic Stress Disorder (PTSD) in both civilian and military populations, including Prolonged Exposure Therapy (PE; Foa, Hembree, & Rothbaum, 2007) and Cognitive Processing Therapy (CPT; Monson et al., 2006). This presentation will provide a brief overview of PE and CPT, as well as a review of the evidence-base for both treatment modalities, and the dissemination efforts within the United States Veterans Affairs system and more recently within the Operational Stress Injury Clinics in Canada. This presentation will also provide a personal overview of PE dissemination, specifically focusing on the training process for becoming a PE therapist and supervisor, and the implementation of PE within the Operational Stress Injury Clinics. **Objective:** The learning objectives of this presentation are to understand the evidence-based psychotherapy that has been developed for military-related PTSD, to comprehend the typical dissemination strategies and the dissemination of Prolonged Exposure Therapy and Cognitive Processing Therapy within the United States Veterans Affairs system and the Operational Stress Injury National Network in Canada, and to identify areas of success and limitation in the dissemination of Prolonged Exposure within the Operational Stress Injury National Network.

Methods: Typical dissemination strategies involve attendance at a workshop and often include post-workshop consultation, which can be provided in a one-on-one and group format with or without digital recordings of the therapy sessions.

Clinical Outcomes: These psychotherapies have been established as effective and efficient psychotherapeutic interventions for reducing PTSD symptomology, as well as reducing the sequelae of comorbid or associated disorders. PE and CPT have been recommended as efficacious treatments by the National Centre for PTSD in the United States, and have been widely disseminated within the United States Veterans Affairs system. More recently, PE and CPT have been disseminated by the Operational Stress Injury National Network within the ten Operational Stress Injury Clinics across Canada.

25. Combat Related PTSD - Examining Treatment Outcomes in a Multi-disciplinary Setting

Sedge, P., Devlin, J., Lessard, S. and Joshi, V.

Department of National Defence

Introduction/Objective: The CF medical community has established nationwide Operational Trauma Stress Support Centres (OTSSC) and expanded mental health clinics where serving members from overseas conflicts can be assessed and treated by multi-disciplinary care teams. Few studies have addressed multi-disciplinary treatment outcomes and published recovery rates for military conflict related PTSD have been consistently disappointing. Early diagnosis and effective multi-disciplinary treatment should provide improved response/recovery rates with long term benefits for CF members' quality of life and employability.

Methods: The cohort consisted of 188 volunteer combat soldiers who returned from Kandahar in Dec 2010. Participants entered into the treatment group upon referral to the OTSSC at CFB Gagetown by their medical officer and following psychiatric or psychological diagnosis of a MH injury using a semi-structured clinical interview. Treatment followed CF and

OTSSC standards and included a combination of psychotropic medication, evidence-based psychotherapy, addictions care, and psycho-social services as indicated. All participants were followed every 3 to 6 months for 18 months using validated measures of symptom severity and functional impairment including the PCL-S, the PHQ-9, the GAD-7, the AUDIT, the OQ-45, and the WEI.

Results: Preliminary results will be presented at the MVHR to include prevalence rates of Mental Health injuries, an examination of rates and type of traumatic exposure, along with response and recovery rates associated with multi-disciplinary treatment at an OTSSC.

Conclusion: As this study is still underway, conclusions are not available at this time but will be available prior to the conference.

26. Dissemination of Evidence-based Psychotherapy for Military-related PTSD: Symposium Part 3

Shields, N., Roth, M., and Monson, C.M.

Parkwood Hospital Operational Stress Injury Clinic

Brief Description: Evidence-based psychotherapies have been developed to treat Post-traumatic Stress Disorder (PTSD) in both civilian and military populations, including Prolonged Exposure Therapy (PE; Foa, Hembree, & Rothbaum, 2007) and Cognitive Processing Therapy (CPT; Monson et al., 2006). This presentation will provide a brief overview of PE and CPT, as well as a review of the evidence-base for both treatment modalities, and the dissemination efforts within the United States Veterans Affairs system and more recently within the Operational Stress Injury Clinics in Canada. This presentation will also provide a personal overview of PE dissemination, specifically focusing on the training process for becoming a PE therapist and supervisor, and the implementation of PE within the Operational Stress Injury Clinics. **Objective:** The learning objectives of this presentation are to understand the evidence-based psychotherapy that has been developed for military-related PTSD, to comprehend the typical dissemination strategies and the dissemination of Prolonged Exposure Therapy and Cognitive Processing Therapy within the United States Veterans Affairs system and the Operational Stress Injury National Network in Canada, and to identify areas of success and limitation in the dissemination of Prolonged Exposure within the Operational Stress Injury National Network.

Methods: Typical dissemination strategies involve attendance at a workshop and often include post-workshop consultation, which can be provided in a one-on-one and group format with or without digital recordings of the therapy sessions.

Clinical Outcomes: These psychotherapies have been established as effective and efficient psychotherapeutic interventions for reducing PTSD symptomology, as well as reducing the sequelae of comorbid or associated disorders. PE and CPT have been recommended as efficacious treatments by the National Centre for PTSD in the United States, and have been widely disseminated within the United States Veterans Affairs system. More recently, PE and CPT have been disseminated by the Operational Stress Injury National Network within the ten Operational Stress Injury Clinics across Canada.

27. Role of Physical Health in Suicidal Ideation in Canadian Forces Veterans - Survey on Transition to Civilian Life

Thompson, J.M., Van Til, L.D., Sweet, J., Sareen, J., Zamorski, M.A., Poirier, A., Bolton, S., MacLean, M.B. and Pedlar D.J.

Veterans Affairs Canada

Introduction/Objective: Suicide occurs in military Veterans as it does in all groups of Canadians. Suicides occur in people with no prior mental health diagnosis. Physical health conditions are more common than mental health conditions among Veterans receiving compensation for service-related disability, and are common in Veterans as they age, as in the general population. The role of physical health in pathways to suicide remains unclear. The objective of this study is to explore the relationship between physical health conditions and suicidal ideation in a group of recently released young and middle-aged Canadian Veterans living in the general population.

Methods: The cross-sectional 2010 Survey on Transition to Civilian Life (STCL) was a national computer-assisted telephone survey and data linkage study of Canadian Forces (CF) Regular Force personnel who released during 1998-2007. The survey was designed by Veterans Affairs Canada and the Department of National Defence, and conducted by Statistics Canada. Measures included sociodemographic and military characteristics, indicators of health, disability and determinants of health. Multiple logistic regressions were conducted to examine whether having a chronic physical health condi-

tion increased the odds of 12-month suicidal ideation.

Results: After adjusting for important sociodemographic and confounding variables, the odds of 12-month suicidal ideation were higher in the presence of mental health conditions. After also adjusting for the presence of mental health conditions, 12-month suicidal ideation was also associated with chronic physical health conditions.

Conclusion: The presence of chronic physical health conditions in former Canadian Forces personnel who released during 1998-2007 was associated with increased odds of 12-month suicidal ideation. This finding has important implications for planning suicide prevention activities for military Veterans.

28. Interrogating Trauma Through Theatrical Performance

Shannon, P.

Ryerson University

Introduction/Objective: The Women & War Project (WWP) is a transnational, multi-discipline research endeavor investigating the experience of women in and around war and mental health treatments for resulting trauma. With the objectives of increasing dialogue regarding women's role in war locally, nationally, and globally; of bringing awareness of the treatable nature of trauma-related symptoms as a result of exposure to war; and of reducing stigmatization of these same trauma-related symptoms, this research includes war-themed live performances, a photo exhibition, conferences in at least two countries, and primary engagement of students and youth in workshops.

Methods: Dance/theatre productions will be performed in theatres throughout Greece, and at military installations, and middle and high schools near military bases in Canada. The research interrogates whether trauma and the experience of war can be positively affected by the act of telling and recording stories as a part of post-traumatic stress treatment. It also asks if there is potential for catharsis in engaging with classical Greek battle-themed plays. Three paper-based questionnaires to determine current views on women and war, knowledge regarding trauma-related sequelae and the extent to which audience members and students believe trauma-related symptoms are stigmatized are utilized. The data captured will contribute to the creation, dissemination and use of health-related knowledge using a multi-disciplinary, multi-national approach.

Results: This research is ongoing and data collection will begin in July 2012 and continue throughout 2013.

Conclusion: Within The Women & War Project, scholars, researchers, and artists are hoping to discover new ways of assessing and treating psychological and emotional trauma as well as increasing dialogue regarding women's role in war locally, nationally, and globally; of bringing awareness of the treatable nature of trauma-related symptoms as a result of exposure to war; and of reducing stigmatization of these same trauma-related symptoms. Literary and cultural theorists have begun to work alongside practitioners and clinicians involved in furthering insights into psychiatric conditions such as bi-polar disorder, PTSD and schizophrenia. The movement away from mere theory and the introduction of drama and dance practice into the therapeutic work of Clinicians, and the assessment of possible behavioral change based on viewing live performance is being evaluated in this three year study.

29. Canadian Forces Nursing Officers Clinical Preparedness to Treat Children in Disasters

Smith, S.

Royal Roads University

Introduction/Objective: Human-made and natural disasters will continue to occur, and millions of children will be impacted by their devastating effects. The preparedness of nurses providing care to these children is paramount. The unique anatomical, physiological, and developmental characteristics of children pose a variety of challenges associated with assessment, diagnosis, and treatment compared to the adult population. Nurses must be adequately trained and educated to provide optimal care. Finally, nurses must be sensitive to their own personal needs to ensure they can provide safe and effective care. The objective of this research was to evaluate the pediatric clinical preparedness of CFNOs.

Methods: An interpretive, generic qualitative research approach was utilized as a complementary framework for the research question: "Are Canadian Forces nursing officers adequately prepared to treat pediatric patients in disasters?" The question was presented to CFNOs who had previously

treated children while deployed to a humanitarian or human-made disaster. Data was collected through 22 face-to-face interviews. The collaboration of numerous data sources including literature, lessons learned, and transcripts ensured triangulation.

Results: A lack of education, training, experience, awareness, and support led to 91% of the participants feeling inadequately prepared to treat children on deployment. 59% had never received any pediatric training or experience prior to deployment. More than 90% felt uncomfortable performing one or more pediatric skills, and 91% experienced the loss of a child while on deployment, and for most this was their first experience. The continual exposure to traumatic events and the impact of feeling unprepared negatively influenced well-being and confidence and led to the development of burn-out, compassion fatigue, and PTSD in 32% of the participants.

Conclusion: Participants felt a lack of preparedness to treat children; they perceived clinical pediatric training, education, and experience prior to deployment to be insufficient and to receive an inadequate focus by Canadian Forces Health Services (CFHS). Recommendations for CFNOs, the chief of nursing services, and the CFHS to enforce clinical preparedness for deployments include affording CFNOs the opportunity to gain pediatric experience and having this experience continually supported during their careers, selecting clinical pediatric experts from interested CFNOs and supporting them within their role to maintain competency, reviewing and updating all deployable medical facility response plans, and conducting annual training exercises.

30. Exploring the Relationships Between Untreated Adverse Childhood Events and Substance Abuse, and Their Impact on PTSD Relapse Rates Among Canadian Military Veterans.

Whelan, J. J. and Jones, C.

Whelan Psychological Services

Introduction/Objective: Recent research has linked adverse childhood events to various mental health concerns, including personality disorders and adult PTSD. In the present study, chart data for 109 CF veterans were reviewed to explore the relationships between early life events, substance abuse, and PTSD relapse rates.

Methods: Chart data were compared for two veteran groups: one group treated previously for PTSD ($n=57$) and a second group of untreated veterans ($n=52$) undergoing initial PTSD assessment. Interview data, responses to the Detailed Assessment of PTSD Scale (DAPS), and the Personality Assessment Inventory (PAI) were submitted to formal statistical analysis.

Results: Analysis of data indicated that a history developmental abuse, adolescent and military substance abuse, and aspects of borderline personality were associated with higher PTSD relapse rates. Anticipated differences between the treated group (e.g., lower rates of depression, lower PTSD severity, and lower suicidality) and the untreated veteran group were not found.

Conclusion: The implications of veteran reports of unresolved developmental abuse and chronic substance abuse, despite involvement in OSI-focussed CBT treatments (i.e., prolonged exposure protocols and EMDR) are discussed. The findings support prior recommendations that clinicians conduct developmentally-focussed assessments for all military personnel presenting with OSIs. The results provide support for formal research to validate measures aimed at predicting the probability of relapse after treatment and to match treatment regimes with particular patient profiles to reduce the occurrence of relapse.

2. Physical Health Research and Rehabilitation in Active Duty Personnel, Veterans or Families

31. Determination of Worst-Case Spinal Resonance Frequencies For the Medical Evacuation of Spinal Cord Injured Patients

Chak, J.D., Dressler, D., Lee, J.H.T., Kwon, B.K. and Crompton, P.A.

University of British Columbia

Introduction/Objective: Evacuation of spinal cord injury (SCI) patients immediately post-injury often involves transport by air or ground ambulance. Inherent vibrations present in these vehicles and a lack of complete immobilization during transport can lead to further exacerbation of the injury. Given that these injuries are unable to be simulated in healthy humans, a previously validated porcine SCI model was used. As such, a study was carried out to determine the specific vibration frequencies that lead to the greatest vertebral motion during simulated transport.

Methods: Miniature female Yucatan pigs ($n = 9$), were subjected to an SCI

using a custom designed weight drop device at T10 while under anesthesia. The animals were placed prone and strapped down onto a spine board and a litter. This litter was mounted to a custom designed shaker table which utilized an electro-dynamic shaker to apply dorsal-ventral vibrations. Animals were subjected to vibrations at designated frequencies between 4 Hz and 100 Hz. Spine motion was measured using six accelerometers mounted on T9-T14.

Results: The vibration of the pigs followed a simple harmonic motion. The frequency responses show that the peak normalized amplitudes occurred during vibration in the range of 5 to 6.5 Hz for all specimens with the most common peak at either 5.5 or 6 Hz.

Conclusion: Individual variations in the pigs' musculoskeletal structure and soft tissues were the primary determinants of resonance. Transportation modes for human SCI patients which contain the resonant frequencies are most likely to induce motion in the spinal canal and could adversely affect the outcome of an SCI.

32. Weighted Backpack Effects of Transtibial Prosthetic Gait

Doyle, S., Besemann, M., Lemaire, E. and Dudek, N.

University of Ottawa

Introduction/Objective: In the military, an individual's ability to carry a weighted backpack is an important mobility consideration. By understanding the changes to an individual's gait when supporting a backpack load, the person's ability to effectively carry heavy loads for prolonged periods could be improved. Most biomechanical studies examined changes in able-bodied gait when carrying a load; however, research is lacking on backpack loads and amputee gait.

Methods: Ten males with unilateral transtibial amputations (K4 level) walked across level ground, uneven ground, and ramp ascent/descent. Each participant completed 5 trials with a 24.5 kg backpack load and 5 trials without a backpack. Three-dimensional motion analysis data was collected with an eight-camera Vicon Motion Analysis system to describe limb motions and compare kinematic outcomes between tasks and conditions. Force platform data was also collected and used to calculate kinetic measures for the prosthetic and intact limbs.

Results: Preliminary results for 4 individuals on level ground showed that, at the prosthetic ankle, dorsiflexion angle before pushoff and ankle dorsiflexion velocity were consistently greater for the weighted condition. Ankle plantarflexion angle during weight acceptance was greater on the intact side for weighted walking. On the prosthetic side, knee angle during swing was consistently greater for the unweighted condition. Hip flexion angular velocity at foot strike was greater for the weighted trials, on both prosthetic and intact sides. Trunk angle decreased during the weighted trials.

Conclusion: This study provides preliminary insight into movement changes with weighted backpack use by people with unilateral transtibial amputations. Further investigations could provide a basis for improving workplace backpack load carriage.

33. Mild Traumatic Brain Injury in Canadian Forces Members on Deployment to Afghanistan: Results of Epidemiologic Surveillance

Garber, B.G. & Zamorski, M.A.

Canadian Forces Health Service Group

Introduction/Objective: Data from the US suggests that up to one-fifth of personnel deployed to the conflicts in Southwest Asia experience mild traumatic brain injury (MTBI) while deployed; most are blast-related. MTBI can cause acute occupational impairments while deployed, and may contribute to persistent post-deployment physical symptoms. However, recent research questions whether these chronic "post-concussive" symptoms are due to the mechanical effects of brain injury. The objectives of this report are 1) to describe the clinical epidemiology of MTBI in Canadian Forces members deployed to Afghanistan, and 2) to explore the association of post-concussive symptoms with MTBI and with mental disorders.

Methods: Subjects were CF personnel who had returned on average five months previously from deployment in the support of the mission in Afghanistan. Since 2009, the CF's Enhanced Post-deployment Screening Questionnaire has included screening questions on MTBI in addition to ones on PTSD, depression, other common psychosocial problems, and physical symptoms. MTBI cases were identified using the Defense and Veterans Brain Injury Center screening questionnaire; MTBI cases reported an acute injury with transient alteration in brain function (including being dazed or confused). Conventional civilian cut-offs were used for symptoms of PTSD

and depression. Seven current post-concussive symptoms were assessed.

Results: 9850 deployed personnel completed screening from 2009-2011. A total of 5.1% (N=506) reported experiencing an injury consistent with MTBI during deployment. Three or more of seven "post-concussive" symptoms (PCS) were present in 23% of those with an MTBI history. Most PCS occurred in the group without MTBI. While there was a significant association of current PCS with a history of MTBI (OR=5.2; 95% CI 3.7 – 7.2) there was a far stronger association with the presence of PTSD and/or depression (OR=109.5; 95% CI 82.2-145.9).

Conclusion: Injuries consistent with MTBI were far less prevalent in this CF population than in the US post-deployment population. Most cases were free of multiple PCS at the time of their post-deployment screening. PCS had a much stronger association with mental disorders than it did with MTBI. The strong association of current PCS with PTSD or depression supports careful assessment of these in personnel with a history of combat-related MTBI and current PCS. This also calls into question the extent to which PCS is driven primarily by mechanical brain injury.

34. Field Feeding Limitations in the Arctic Operational Environment

Goodman, L.S., Sullivan-Kwantes, W. and Blais, A.R.

Defence Research and Development Canada

Introduction: The conduct of CF operations in the Arctic will increase in coming years, as sovereignty activities increase. This will require a resilient and performance-ready soldier. DRDC is evaluating incremental field feeding practices from a physiological and behavioural perspective, in order to optimize field nutritional provisions in harsh environments. An investigation was undertaken during a recent Arctic Operations Course (AOC) in Resolute NV and presents key observations obtained from course participants on nutritional behaviours, preferences and opinions relating to preparing and consuming the Army's field rations in a severe cold climate.

Methods: 36 AOC participants volunteered to participate in a written survey and 25 volunteers to participate in a semi-structured interview during the March 2012 AOC in Resolute NV. The AOC consisted of exposure to a variety of outdoor operational-specific Arctic training activities (snow cave, igloo construction/survival, snow camping, over-land transit, and other). The students were interviewed and completed a written survey immediately post-training in Resolute. Respondents were experienced soldiers, with 84% having past deployments to Afghanistan.

Results: Survey data revealed a low mean score (mean, SD) of 2.14 ('largely unacceptable' \pm 1.10 of a maximum 5.0 ('completely acceptable'), ($p < 0001$) for overall adequacy of field rations for cold operations. Ratings of cooking time, fuel adequacy, texture, saltiness and taste also ranked significantly below the mid-point score ('borderline') ($p < .05$) For interview responses, the most frequent responses included: unreliability of cooking stoves; incomplete rations consumption; deferral of lunch due to time pressure/weather; highly refined carbohydrates; inadequate high-quality fats and proteins; preferential consumption of snacks replacing main meals; wastage of packaging; individual and team morale decrements.

Conclusion: Current field feeding provisions may be inadequate vis-à-vis macronutrient content to support CF operations in extreme cold. This increases risk of impaired performance, cold-induced injuries and negatively impacts individual and unit morale when feeding is delayed or impaired. Macro-nutritional content of field rations should be re-evaluated towards enabling soldiers' operational effectiveness, resilience and performance in the Arctic. A DRDC project will address these issues and will involve a review of allies' field feeding practices, followed by energy expenditure and consumption (field and laboratory) studies to provide CF with advice on physiological/nutritional adequacy for improved field feeding options.

35. Validation of the Functional Movement Screen As a Predictor of Non Contact Muscular Skeletal Injuries on a Military Population Participating in Increased Training and Physical Activity

Hazledine, N.J., Neil, R. and Thomas, G.

Canadian Forces Health Services

Introduction/Objective: Training injuries in the military result in a loss of training time and a reduction in physical fitness this can have a high impact to the individual and to the military in terms of cost and personal. The ability to predict individuals who may be at a higher risk of injury through a pre-screening tool is of great interest. While the Functional Movement Screen (FMS) has shown some potential by identifying deficiencies in mobility and stability in high performance athletes and elite military populations its use

has not been validated in the general military population.

Methods: Subjects for the research program participated in the Functional Movement Screen (FMS). The FMS includes seven tests that assess mobility and stability of the member out of a total score of 21. The testing was carried out by a certified FMS practitioner. The scores were tabulated at the start of each member's arrival at the unit, prior to the start of their training. All members that sustain a medical concern while at the unit presented themselves to the unit medical team and both contact and non contact injuries were recorded during the member's attachment to the unit.

Results: 174 CF members (22 female/152 male) were FMS tested, mean age 22.2 (18-38). 29% (51) reported with an MSK injury that required medication, modified duties or referral for further care or investigation during the research period. Of the injured 53% (27) recorded a score of 14 or below where as 47% (24) scored above 14 (mean 14.2 range 7-19). Initial analysis indicates that 30% of members who scored above 14 we injured compared to 29% of members who scored 14 and below.

Conclusion: At the time of submitting the abstract a complete in-depth analysis of the data is ongoing. The conclusion will follow the analysis of the data and will be presented at the conference. Hypothesis. That FMS is a valid system for predicting non contact injuries, prior to participating in increased training and physical activity levels, in the military population that comprise the CF Ceremonial Guard.

36. Case Study of a Veteran 16 Years Post Injury: Using the CAREN and Motion Capture For Assessment

Hebert, J.S. and Lewicke, J.

University of Alberta

Introduction/Objective: The long term impacts of the injuries sustained in combat by CF members have not been systematically studied. Veterans aging with impairments related to injury face significant challenges and require ongoing assessment and follow-up to monitor and potentially mitigate secondary complications such as advanced joint degeneration and other complications related to abnormal biomechanics of movement.

Methods: We present a case study of an older veteran injured 16 years prior with resultant bilateral transtibial amputations and severe hip injury. We performed quantitative motion analysis of his gait on level overground walking as well as on the Computer Assisted Rehabilitation Environment (CAREN) with challenges, and with prosthetic alignment changes.

Results: The kinematics on level ground and on the CAREN system were similar, but with more asymmetry and slower velocity on the CAREN. Platform tilt and alignment changes suggested improved observational gait, but the post-adjustment kinematics showed increased pelvic asymmetry.

Conclusion: In this case study, the observational gait analysis was not consistent with the results found in the kinematics from motion capture. There were differences found in overground and treadmill walking. The differences between the testing conditions were informative and helpful as an assessment tool. There may be a role for the CAREN in dynamic prosthetic alignment and to optimize gait biomechanics under challenge in an attempt to reduce risks of long term complications.

37. Health-Related Quality of Life in Canadian Veterans: Analysis of data from the Survey on Transition to Civilian Life

Hopman, W., VanDenKerkhof, E.G., Van Til, L.D., Thompson, J.M., Sudom, K. and Sweet, J.

Queen's University and Kingston General Hospital

Introduction/Objective: For most military personnel transitioning from service to civilian life the process is relatively smooth, but others experience difficult adjustment and compromised health-related quality of life (HRQoL). The purpose of this study is to gain insight into factors associated with physically and mentally oriented HRQoL.

Methods: Data are from the 2010 cross-sectional Survey on Transition to Civilian Life, a study of those who released from service between January 1998 and December 2007. Data include sociodemographic and military characteristics, health, disability and determinants of health. HRQoL was assessed using the SF-12, which produces a Physical (PCS) and Mental (MCS) Component Summary. Multivariable linear regression models will be developed to identify factors associated with these outcomes.

Results: Analyses are based on a nationally representative sample of 3,154 veterans. Mean age was 46 years, 12% were women, and 34% were participating in Veterans Affairs Canada (VAC) programs. Compared to age- and sex-adjusted normative values, the sample had below-average PCS (47) and

average MCS (52). Unadjusted factors associated with poorer HRQoL included poor perceived health, stress, disability, low social support and weak sense of community belonging, low income and unemployment.

Conclusion: Mean PCS was considerably lower than the Canadian general population norms, suggesting that this should be investigated in addition to mental health. Regression analyses will identify characteristics of those at risk for poor HRQoL outcomes as they transition into civilian life. These findings can be used to identify high-risk groups and those who may benefit from interventions such as additional support and education.

38. Biomechanics of the Lower Cervical Spine Under Various Moments Loading

Mesfar, W. and Moglo, K.

King Saud University and Royal Military College of Canada

Introduction/Objective: The understanding of the biomechanics of the cervical spine continues to be the challenge of various studies. In this study, the focus was on the lower cervical spine (C4-T1) to determine the impact of the applied moment to centre of mass of the head (CMH) in different plane on the contact force (CF) at the facets joints.

Methods: A 3D nonlinear head and neck complex finite element model was developed and constructed based on CT scans and MRI images. The bone structures reconstruction was based on CT scan images; however the intervertebral discs reconstruction was based on MRI images. The FE model consists of bony structures and their cartilage facet joints, intervertebral discs and all the ligaments. To quantify the effect of the moment applied to CMH at different planes, a moment of 2.0N.m was applied to simulate the left/Right lateral bending, left/Right axial Rotation and the Flexion movement. For the extension movement, only 1.2N.m was applied.

Results: The non-nil left facets joints CF was computed under the left lateral-bending, the right axial-rotation and the extension. The non-nil CF, however, at the right facets joints was computed only under the Right Lateral-Bending, the Left axial-Rotation and the Extension. Under the lateral-bending moment, the maximum CF reaches 42N under 2N.m at C7-T1 level. Under axial-rotation moment, the CF increases with the moment and when the facets is proximally reaching a maximum of 55N. Under the extension, the CF is maximum at C4-C5 and C7-T1. In extension, the maximum CF of 15N was computed at C4-C5 and C7-T1 levels.

Conclusion: This study evaluated the impact of the applied moments to CMH at different planes on the CF at the caudal vertebrae facets joints. The results of this study may be of great interest to suggest rehabilitation exercises and movement to prevent certain injuries for a specific cervical joints problems to military, athletes and civil populations. In military applications for example, the pilots of supersonic jet may work under high gravity which stresses the cervical spine and a well comprehension of the biomechanics of the cervical spine may help to avoid a potential damage of the cartilage at the facets joints.

39. Standardized Evaluation of the Effects of Head Posture on the Isometric Force Generating Capacity of the Neck

Pelland, L., Gilchrist, I., Chapman, E. and Moglo, K.

Queen's University

Introduction/Objective: Flight-related (FR) neck pain among military helicopter pilots and crew members is a significant health problem, leading to temporary loss of flight status and, in some cases, to permanent disability claims. The use of night vision goggles (NVGs) has been the most consistently reported factor associated with the development of FR neck pain. The effect of NVGs, however, must be considered within the broader ergonomic context of flying, which includes prolonged static neck and body postures, whole-body vibration, and heavy head-worn equipment. The goal of this study was to evaluate the effects of static head flexion posture on the isometric force generating capacity of the neck.

Methods: Physically active males, 20 to 30 years old, with no history of neck pain, were recruited from the community. Maximal voluntary isometric contractions (MVICs) were measured using the Multi-Cervical Unit (MCU; BTE Technologies). MVICs were recorded along eight directions: extension; flexion; right/left side-flexion; and right/left flexion and extension along axes at 45° angles from mid-sagittal neutral. Subjects performed 3 MVICs along each direction, in pseudo-random order. MVICs were recorded for two head postures: neutral, P1, and 20° angle of forward flexion, P2. Selected parameters of force were computed (rate of force development, RFD; time to 50% of initial peak in force, T50PF; and peak force, PF).

Results: Direction of force application significantly modulated PF in P1 ($P < 0.001$), with the highest magnitudes of isometric force developed in extension along midline and 45° axes ($P < 0.001$). MVIC magnitudes were globally increased in P2 ($P = 0.016$), again with the highest magnitudes exerted in extension ($P = 0.025$). P1 and P2 produced differences in the global coordination of RFD. For P1, RFD in flexion and right/left extension along 45° axes were positively correlated (left; $r = 0.89$, $P = 0.02$; right, $r = 0.81$, $P = 0.05$); P2 produced a positive correlation of RFD in flexion and extension ($r = 0.90$, $P = 0.015$). T50PF was significantly influenced by head posture ($P = 0.008$), with 50% of initial peak force being reached earlier for P1 (124 ms, P1; 184 ms, P2).

Conclusion: Head posture produced distinct differences in the magnitude and coordination of MVICs that would influence the biomechanical response of the cervical spine to load applications. While the overall magnitude of MVICs was higher for the head flexion posture, force was developed later in this posture, with changes in the coordination between MVICs produced along the mid-sagittal and 45° axes. This change in coordination could reduce the capacity of the neck to effectively resist inertial loads applied to the head in this posture during flight manoeuvres.

40. Physical Health Conditions of Veterans

Poirier, A., MacLean, M., Van Til, L.D., Thompson, J.M., Sweet, J., Pedlar, D.J., Sudom, K. and Campbell, C. Veterans Affairs Canada

Introduction/Objective: A recent national survey of Regular Force Veterans found that the majority reported at least one chronic physical health condition. The objective of this paper was to examine the prevalence of various physical health conditions among this population and compare these rates to those of the general Canadian population.

Methods: The cross-sectional 2010 Survey on Transition to Civilian Life (STCL) was a national computer-assisted telephone survey and data linkage study of Canadian Forces (CF) Regular Force personnel who released during 1998-2007. Respondents were asked about a number of chronic physical health conditions that had lasted or were expected to last six months or more, and had been diagnosed by a health professional. For comparison to the general population, the Canadian Community Health Survey 2007-08 prevalence estimates were age and sex standardized to the Veteran population and confidence intervals of 95% were used for significance testing.

Results: The majority (66%) reported the presence of at least one chronic physical health condition. The most prevalent conditions were back problems (40%), followed by hearing problems (28%) and arthritis (23%). The prevalence rates for some of the more common conditions were about twice that of the general population, such as arthritis (23% vs 11%) and back problems (40% vs 21%). While rates for some of the less common conditions were not significantly different between Veterans and the general population, such as heart disease (4% vs 3%) and cancer (both at 1%).

Conclusion: Among the more common conditions, prevalence rates were higher for Veterans compared to the general Canadian population. However, prevalence rates for less common conditions were similar. These findings have important implications for prevention, outreach and programs.

41. Evaluation of the Canadian Forces Injury Surveillance Pilot Project in Valcartier, Quebec, Canada

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Canadian Forces Health Services

Introduction/Objective: Physical activity is a priority for the Canadian Forces (CF) to ensure optimal fitness and operational readiness of personnel. However, physical and military training are associated with an increased risk of injuries and associated costs. The CF Injury Surveillance Pilot Project (ISPP) system was implemented in 2010 Valcartier, Quebec using a self-report form to gain detailed information about circumstances leading to injuries. It was applied to casualties at the point of medical contact.

An evaluation of the ISPP was conducted in 2011 to examine the following attributes: data completeness, sensitivity, representativeness, reliability, timeliness, simplicity, flexibility, acceptability and usefulness.

Methods: The study involved three different components: a retrospective chart review, a key informant interview survey and a coding reliability study. The chart review, which included sick parade visits between March and May 2011, evaluated the ISPP system's sensitivity and representativeness. Key informant interviews were completed with various stakeholders to gather information about missing information and to evaluate other system attributes including: simplicity, acceptability, sustainability, timelines and flexibility.

A total of 35 stakeholders, medical and non-medical staff were invited to participate. The Kappa statistic was utilized to examine diagnostic coding consistency between ISPP staff using a sample of 100 patient questionnaires.

Results: A total of 121 injuries were detected from 525 charts and 41 (34%) were captured with the ISPP. Sensitivity increased to 52% by December 2011. Coding reliability (Kappa) was excellent at 0.85 for diagnosis, 0.85 for body parts, 0.88 for activity and 0.93 for referrals. The interview response was high at 89% (31/35). Users reported the system to be simple flexible, acceptable and valuable. Stakeholders emphasized the importance of collecting data to identify injury trends and causes, to inform decision-makers about health status of military personnel, to guide development of preventive measures and to measure effectiveness of these measures.

Conclusion: The evaluation of ISPP completed in 2011, showed the system was considered useful, flexible and acceptable to key stakeholders and could successfully capture injuries presenting for medical care. However, because the evaluation was conducted early after the ISPP was deployed and did not examine all potential medical visits, another outcome evaluation should be conducted in 2013 to assess longer term performance and a wider spectrum of injuries presenting for medical care.

42. The Effect of Self-Paced Treadmill Speed on Step Parameters Over Multiple Walking Conditions in a Virtual Environment

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Introduction: The CAREN virtual reality technology provides a controlled environment capable of simulating different walking conditions that challenge walking stability, such as uneven surfaces. The CAREN virtual reality system (Motek, Amsterdam, Netherlands) consists of a virtual scene projected 180° around the subject and a dual belt treadmill embedded into a platform capable of moving in six degrees-of-motion. Investigating walking stability using this environment may influence health-care decisions for people with mobility-related disabilities. The purpose of this study was to develop a virtual scene that challenges walking stability, and to explore effects of self-paced treadmill speed on step parameters in healthy individuals walking in this environment.

Methods: A virtual scene was developed to include eight walking conditions: level-ground, 8° uphill, 8° downhill, left and right cross-slope of 4°, rolling hills, rocks (3 degrees-of-freedom), and medial-lateral translations. Each walking condition was presented in 20 meter sections and was separated by a level-ground section. Participants completed three trials at a constant treadmill speed and three trials at a self-paced treadmill speed. Kinematic data were captured at 100 Hz using a 12 camera VICON motion capture system. Step length, step width, and treadmill belt velocity were calculated and used to examine the effects of self-paced walking.

Results: Currently, a single participant completed the experimental protocol. During the self-paced speed condition, the participant walked faster in all walking conditions except uphill, compared to the constant speed condition. At a constant treadmill speed the participant adapted to different walking conditions by increasing step width and maintaining a similar step length relative to level-ground. At a variable treadmill speed the participant adapted by adjusting step width and length and was dependent on the walking condition.

Conclusion: The walking conditions presented affected the stepping strategies of a healthy participant when walking at a constant speed and self-paced speed. The stepping strategy was different when walking at a self-paced speed compared to a constant speed. These preliminary findings suggest that an individual's preferred walking velocity should be considered as a strategy to maintain stability while walking over challenging surfaces.

43. Pain in Canadian Veterans: Analysis of Data From the Survey on Transition to Civilian Life

VanDenKerkhof, E.G., Hopman, W., Van Til, L.D., Thompson, J.M., Sudom, K. and Sweet, J.

Queen's University and Veterans Affairs Canada

Introduction/Objective: Few studies have identified risk factors for chronic pain in Canadian Veterans. A study by Veterans Affairs Canada (VAC) and the Department of National Defence (DND) found that in the Veteran population chronic pain/discomfort is commonly comorbid with mental health conditions, particularly musculoskeletal disorders. The purpose of this study is to describe the burden and potential predictive

factors of chronic pain in Canadian veterans.

Methods: Data is from the Survey on Transition to Civilian Life, a cross-sectional study of Canadian Forces Regular Force Veterans who were released from service between January 1, 1998 and December 31, 2007. Chronic pain is defined as pain/discomfort over the past 6 months. Objectives were to describe the prevalence of chronic pain and identify sociodemographic, health behaviour, employment/income, disability and physical and mental health conditions associated with chronic pain. Multivariable logistic regression was used to identify factors associated with pain. Ethics approval was obtained from the Queen's University Research Ethics Board.

Results: Of the Veterans sampled, the response rate was 71%, and 94% agreed to share responses with VAC and DND, providing a nationally representative sample of 3,154. 65% were not clients of Veterans Affairs. Mean age was 46 (range 20-67), 88% were male and 60% were married. Fifty-three percent served ≥20 years and 58% were junior or senior non-commissioned officers, 8% senior officers and 49% in the army. Forty-eight percent had high school education or less. Fifty-three percent reported pain always and 21% reported recurring pain.

Conclusion: This is the first study to explore potential risk factors for chronic pain in Canadian Veterans. Preliminary results indicate a higher prevalence of chronic pain than in the general population. Analysis is underway to examine the relationship between sociodemographic, health behavior, disability and physical and mental health characteristics and chronic pain. Clinical implications include the identification of high-risk groups for targeted management of pain. Results could also inform the design of future longitudinal studies including identifying and testing interventions for the prevention of chronic pain.

44. The Development of Military Preventive Medicine

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Abstract: Military preventive medicine is the prevention or control of disease among members of the military forces and the maintenance and conservation of the health and fitness of service members. It is analogous to public health activities in civilian communities, except as modified in scope by military conditions. These conditions result from characteristics peculiar to a military population for example operational, occupational and environmental factors which accompany military activities and the restrictions imposed on the practice of military medicine by the nature of the military mission. Military preventive medicine is a complex domain which encompasses a broad spectrum of medicine including: health policy formulation and implementation, planning health support, clinical and occupational health research, military command, administration and management, training, occupational health assessment and the provision of health advice to military commanders.

Today the goal of the military preventive medical educational programs is to provide students with the necessary academic background to practise as competent preventive medicine officers in the armed forces. These officers will be expected to use their acquired quantitative and analytical skills in biostatistics and epidemiology to identify and measure military health needs and to investigate the impact of biological, environmental, and behavioural factors to solve military health problems, and have the administrative skills to plan, analyse, manage, and improve service public health programs.

The deployment of sanitary then preventive medicine training and educational programs will be described from their European origins, with an emphasis on Armies' training, but not overlooking the vital contributions made by Naval forces and more recently Air Forces. Current Australian Defence Force preventive medicine training activities will be described as well as the educational programs provided by the Centre for Military and Veterans' Health. The current international framework for military preventive medicine doctrine, research and collaboration will be described including the relevant aspects of The Technical Cooperation Program (TTCP); the American, British, Canadian, Australian and New Zealand Armies' Program (ABCA Armies); Air and Space Interoperability Council (ASIC); and The Committee of the Chiefs of Military Medical Services in NATO (COMEDS). Finally, a concept for international collaboration between the key tertiary military health research institutions along the lines of a Cochrane model, designed to encourage world class research and education to provide accurate, evidence based military preventive healthcare interventions will be presented.

3. Novel Health Technologies That Are Relevant to Military Service

45. Development of a Novel Helmet to Prevent Neck Injuries in Head First Impact and to Provide Increased Protection Against Concussion

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University of British Columbia

Introduction/Objective: Many concussions occur during head impacts [1] and this is of primary concern for sports and military helmet design. Our group is developing a helmet to minimize head injury risk, as well as mitigate the potential for spinal injuries in head-first impacts. A prototype football helmet has been built. A military helmet could be similarly designed and constructed.

Methods: A PNT mechanism is used to connect two helmet shells and padding is placed within the inner shell. Upon an impact to the top of the head of significant force, the PNT mechanism deploys and the inner shell will rotate in either a flexion or extension manner. This deployment not only allows for an escape path for the neck, it also provides acceleration ride-down, significantly reducing head accelerations. In oblique impacts in all directions, the outer shell will deform into the void between the two shells, absorbing additional energy than what padding alone can absorb.

Results: Testing conducted against a contemporary commercially available football helmet to show the effectiveness of the double-shell concept at mitigating head accelerations has shown reductions of 17% in impacts to the back of the head. Furthermore, in impacts to the top of the head, resultant linear head accelerations were reduced by 36%.

Conclusion: The potential of a PNT helmet to prevent the concussions recorded by Guskiewicz et al. [2] was estimated using the concussion risk curve [3]. The PNT helmet reduced the potential for concussion in every impact sustained; in five of 13 instances, it decreased the potential to less than 50% from over 50%.

46. A Novel Sensor System for Improved Muscle Function Analysis

Hashemi, J., Morin, E.L., Hashtrudi-Zaad, K. and Moussavi, P.
Queen's University

Introduction/Objective: Muscle contraction causes force generation which is translated into movement and task performance. When a muscle contracts the surface electromyogram or SEMG can be detected using electrodes placed on the skin. SEMG is often used to estimate muscle force, and assess changes in muscle function due to muscle pathology. However, an accurate picture of muscle activation from SEMG is difficult to achieve. The objective of this work is to develop and test an advanced sensor, which integrates two sensing modalities, for reliable muscle function assessment.

Methods: An integrated sensor comprising an active bipolar SEMG electrode (Invenium AE100) and a contact pressure sensor (Flexiforce A201) has been developed. Six integrated sensors are arranged on a patch in a 2x3 grid, to detect muscle activity and surface muscle pressure (SMP). In preliminary testing, patches were placed over the biceps and triceps brachii muscles of two subjects and held in place by a cuff, which also loads the pressure sensors. Subjects performed isometric flexion and extension contractions at twelve joint angles, varying from 0-deg (full extension) to 110-deg.

Results: The sensor grids provided surface maps of muscle activity level and SMP. Subjects maintained a constant SEMG level for one electrode location at each joint angle. SEMG amplitude differed across the electrode locations and with joint angle. Pressure also varied across different sensor positions, reflecting the surface conformation of the muscle during contraction. Pressures over both muscles consistently increased with increasing flexion angle. Careful calibration of the pressure sensors is required to avoid saturation.

Conclusion: In any given year, more than 30% of Canadian Forces personnel will suffer from musculoskeletal injury, often due to training [1]. The integrated SEMG-SMP sensor can potentially be used to track the muscle functional status during rehabilitation following an injury. Preliminary testing has shown the complementarity of the two sensor modalities. Further system testing and development of advanced processing algorithms, in particular for more accurate muscle force estimation, is planned. [1] Adams, S. Non-battle-related injuries take their toll. Legion magazine, May 2011.

47. A Novel Method to Provide Sensory Feedback and Improve Function of Myoelectric Prostheses after Upper Limb Amputation

Hebert, J.S., Ming Chan, K., Olson, J., Mohart, M. and Dawson, M.
University of Alberta

Introduction/Objective: Traumatic amputation of the arm is a devastating loss, with limited ability to replace dextrous hand function with available prosthetic technology. Attempts to restore upper limb (UL) function have been improving considerably through recent innovative advances; however, the lack of sensory feedback from a prosthetic hand remains a formidable barrier that limits the use of the prosthesis for fine dexterous tasks.

Methods: We developed an innovative surgical method to restore hand sensation after UL loss. In a subject with traumatic UL amputation, we modified the targeted reinnervation procedure developed by Kuiken et al and used advanced microsurgical techniques to reconnect fascicles of the median and ulnar nerve with a high proportion of sensory axons to cutaneous nerves in the remaining UL. Following reinnervation, we performed sensory mapping and functional tests with a robotic device incorporating a sensory feedback tactor.

Results: The procedure restored the sensory map of the hand to the UL in discrete skin locations. This sensory map was used to provide feedback for hand sensation through a step motor activated by pressure sensors embedded in a robotic training tool. The subject was able to sense pressure and force from the myoelectric training tool gripper while using motor control to grasp objects, and accurately identify different densities and sizes of randomly presented objects.

Conclusion: This case study shows that relevant physiological sensation of the hand can be restored to an upper limb amputee and linked to functional motor tasks. The hope is that any member of the Canadian Forces that suffers a proximal arm amputation can benefit from this advanced surgical reconstruction and the latest prosthetic treatment will allow them to return to the highest level of upper extremity function possible.

48. First Results of an Innovative Blue Light Device Used at Night by Patrol Officers to Better Stimulate Alertness

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Introduction/Objective: Operator fatigue especially at night, has been recognized as a key safety issue in all transportation modes – road, rail, air and marine. It is known that vigilance can be stimulated by blue light that better stimulate the biological clock responsible for the decrease of vigilance at night. Using light in a vehicle at night represents a challenge since it could reduce night vision. Our discovery that pulsed blue light is twice more effective than constant light, has rendered possible the development of a dimmer blue light that does not compromise night vision.

Methods: The trial was proposed to officers (N=15) that were submitted to three conditions (no light, dim red light used as a placebo and dim blue light) while in a police car for 4 consecutive night shifts on three different weeks in the summer. Light level in the car was about 1 lux. Vigilance was assessed at night every two hours and salivary melatonin (to assess circadian clock adjustment) was obtained on the night before and after each week of 4 consecutive night shifts. All workers wore an actiwatch for ambulatory sleep assessment on day and night shifts for comparison.

Results: Preliminary analysis revealed that sleep during day shift (mean 5h50) was significantly shorter than during the night shifts (mean of 6h24) when taking into account naps, but not different when taking account only the main sleep episode except for the blue light condition where officers tended to sleep 27 min longer. Mean phase shifts were 2h42±1h35 in baseline (no light), 2h40±1h50 in blue light and 2h01±0h17 in red light. Police officers also felt that the light device was contributing to maintain alertness and improved their sleep.

Conclusion: It would appear that dim pulsed blue light exposure at night, even in a car, could yield to some benefit to the operator. It was interesting as in other studies to find out that blue light at night tended to improve daytime sleep. The early natural sunrise in summer time could explain the phase-shift observed in the no artificial light baseline condition. To avoid the natural sunrise interference, we have just completed this winter the study in 30 additional police officers that followed the same protocol.

49. Novel Functional Magnetic Resonance Imaging to Quantify the Neuronal Haemodynamic and Metabolic Basis of Cognitive Impairment in Traumatic Brain Injury and Amyotrophic Lateral Sclerosis

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Introduction/Objective: Traditional functional magnetic resonance imaging (fMRI) does not measure neuronal activity directly but relies on blood oxy-

gen level-dependent (BOLD) signals reflecting changes in haemodynamics and metabolism. Accordingly, one cannot rely only on this complex signal; one must also quantify cerebral blood flow and oxygen (O₂) metabolism. While the former can be measured to estimate the latter through a calibrated model and carbon dioxide (CO₂) challenges, conventional gas manipulation leads to estimation uncertainties. Recent advances in gas control enhance fMRI's potential to detect specific dysfunctions underlying cognitive impairment.

Methods: To demonstrate our novel fMRI methodology, we scanned nine healthy adults at 3T during respiratory/neuronal tasks. We compared robust-computerized versus manual gas delivery through O₂/CO₂ challenges via facemask, followed by visual/sensorimotor tasks of rotating-checkerboards/finger-appositions.

Results: The automated-control yielded signals of increased linearity/uniformity across the brain. Reduced variability allowed calibration in individuals for proper quantification of their distinct responses in visual/sensorimotor cortices. Our results demonstrate the superiority of the computerized system in reducing calibration time and inducing O₂ challenges, better-tolerated than CO₂, of vital importance to patients.

Conclusion: Novel fMRI methodology provided robust quantification of haemodynamic and metabolic responses underlying brain activation. Having provided 'proof of concept' in healthy adults, we propose to investigate specific cognitive tasks in traumatic brain injury (TBI) and amyotrophic lateral sclerosis (ALS). TBI is associated with long-term functional/cognitive deficiencies and may lead to ALS, as evidenced by a doubling of incidence in Gulf War veterans and contact-sport athletes. Fast non-invasive quantitative fMRI holds great promise in exploring this causality and optimizing the diagnosis/management of these patients.

50. 3D Kinematics and Kinetics of Drop Jumps With the K-SRD™ Dermoskeleton

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University of Ottawa

Introduction/Objective: Overloading results in significant increase in chronic and acute injuries. Current advancement in biomechanics points towards the use of exoskeleton to assist mobility, endurance, and load carrying capability, and also help prevent injuries. Our study assesses the effects of a dermoskeleton on the 3D kinematics and kinetics of different drop jumps. The product, K-SRD™, is a novel motorized knee device from B-Temia Inc.

Methods: A Hybrid III dummy was rigged to a twin-wire system and dropped at 40 and 70cm with 89 and 116kg, with and without the K-SRD™. A volunteer performed drop jumps similarly at 40cm. A modified Cleveland model marker set was used. Kinetics were obtained with inverse dynamics.

Results: With the dummy, peak knee flexion was reduced with the K-SRD™. It increased with the added weight and more so with height. Knee adduction was reduced with the K-SRD™ in all conditions. Knee flexion moments were consistently higher without the K-SRD™. The K-SRD™ reduced the range of frontal plane knee moments; even preventing an abduction moment. With the volunteer, the rate of angle change was lower with the K-SRD™ and knee power absorption was increased.

Conclusion: Several biomechanical variables were influenced by wearing the K-SRD™. Height influenced kinetics more than weight. Using the K-SRD™ stiffened the knee joint. The reduced rate of change in flexion angle indicates a stiffening effect that could help reduce tibial translation and consequently the risks of ACL tears. It also reduced its frontal plane excursion and abduction moment, thus potentially avoiding injuries in the medial and lateral ligaments. In general, the K-SRD™ assisted the user in the sagittal plane and increased medio-lateral stability.

51. Gene Expression Profiles of Hair Follicles in Rats Subjected to Blast Head Trauma

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Royal Military College of Canada, University of New Brunswick and Defence Research and Development Canada.

Introduction: The challenge for operational military health assessment is to develop novel and effective non-invasive methods to assess physiological conditions on-site. Recent studies have suggested that hair follicles could be used to reveal information about the physiological condition of an individual, especially related to the hypothalamus-pituitary-adrenal axis, which

is implicated in responding to and reducing the negative effects of stress. We propose to use an animal model subject to stress (i.e., blast head trauma) as a proof-of-concept to demonstrate that hair follicles are a feasible clinical source of reliable information into the physiology of stress.

Objectives: Using an animal blast head trauma model, the objectives are to: 1) assess the expression profile of stress-related genes (and others) in head hair follicles, 2) establish a correlation between blood gene expression profiles and hair transcriptional profiles, and 3) determine the relationship between the individual's stress level and molecular profiles obtained in 1).

Methods: An experimental animal model has been developed in which anaesthetized rats are subject to a blast head trauma. Head hair (n=10/individual) and blood samples have been collected after blast head trauma, not stressed animals were also sampled (control group).

Head hair follicle samples were collected at the same time that blood was drawn. Head hairs were plucked along with their follicles at the nostril area and were stored on dry ice until gene expression profiling is performed.

Results: Proof-of-concept and preliminary data that head hair follicles can be used as an indicator of stress will be presented.

Conclusion: The main premise of the project is that hair follicles are readily accessible clinical samples, which can provide a potential window into the soldier's physiology of stress.

52. Computer Assistance For Internal Fixation of Scaphoid Fractures

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Queen's University and Kingston General Hospital

Introduction/Objective: A recent study of scaphoid fractures in a military population revealed a higher incidence of these injuries compared to the general populous. The standard treatment is to immobilize the arm in a cast for several months thereby limiting mobility and impacting the ability to work. A surgical alternative is a technically challenging procedure using a small screw to repair the fracture. Our work aimed to integrate and evaluate computer technology to assist in this difficult procedure for scaphoid fracture repair.

Methods: Our technique uses a 3D fluoroscope for imaging. Before the procedure, a calibration device is used to establish a mathematical relationship between the fluoroscope and a tracking camera mounted on the ceiling of the operating room. During the procedure, a holder designed to secure the patient's wrist is tracked by the camera, along with a surgical drill. The position information of the wrist holder and drill is used to display a virtual image of the drill on a digitally-rendered 3D x-ray to assist screw placement.

Results: Using model and cadaver-based studies, the performance of this computer-assisted method for scaphoid fixation was compared to conventional methods of this procedure that used a 2D fluoroscope and no computer assistance. The computer-assisted method was statistically significantly more accurate, less likely to cause injury and required less radiation use than conventional means of scaphoid fixation. The three surgeons who used the system found it easy to use, and were confident performing the procedure with computer assistance.

Conclusion: The computer-assisted approach provided several key advantages compared to the conventional method of surgical scaphoid fixation. Computer-assistance reduced the radiation exposure, an important consideration for patients as well as the surgeons who perform these procedures. The computer-assisted technique also improved screw placement which is linked to better clinical outcomes of this treatment. The system has been tested and validated in in-vitro and ex-vivo models, and we are now commencing preliminary in-vivo studies. We are excited by the promise of this technology which opens the door to new and better treatment options for patients.

53. Would an On-Body Lifting Aid Be Helpful to Specific Military Trades?

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Queen's University

Introduction/Objective: The Personal Lift-Assist Device (PLAD) is an on-body ergonomic aid designed for jobs that require of repeated manual lifting and forward bending tasks. A spring and cable mechanism, that is anchored at the shoulders and feet and offset at the pelvis, provides an additional extensor force that assists the back muscles during lifting and static holding. Studies of PLAD have involved three major questions: 1) Is the PLAD effective? 2) Is the PLAD safe? 3) Is the PLAD user-friendly? To date, only lab studies and private sector companies have been studied. The question

is: Would the PLAD be helpful to specific military trades?

Methods: Across 14 different studies, different scientific methods were used to assess back pain risk factors (i.e., load mass, lifting style, asymmetric lifting, muscular fatigue), safety-related factors (i.e., lifting technique, lifting coordination dynamic spinal stability) and user-acceptability factors (i.e., worker questionnaires).

Results: The PLAD reduced back muscle moments by 13.2% - 19.4% and EMG by 17% - 27% ($p < 0.05$) for back pain risk factors. For safety-related factors, lifting technique was altered so that the lifts were accomplished with less lumbar spine flexion and greater hip rotation ($p < 0.01$) as well as improved lumbar spine-hip coordination and greater dynamic stability ($p < 0.01$). For user-acceptability, 83% of workers felt it was effective with 67% of workers saying they would wear it for specific jobs.

Conclusion: The PLAD has been proven to be effective, safe and has high user-acceptability ratings among industrial workers. Since the CF has many of the same trades as the civilian community, field trials are warranted in specific trades to verify its acceptability among specific CF personnel.

54. Advanced Treatment for Severe Upper Limb Traumatic Injuries From Bone Graft to Star Wars and Star Trek: Future Options to Restore Function

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University of Alberta and 1 Canadian Field Hospital

Brief Description: Introduction / objectives: Severe traumatic injuries in military conflict can be complicated by involving multiple limbs, as well as brain, abdominal and psychological injuries in patients with potentially long active lives ahead of them. Several options for advanced care, including advanced technology and treatment techniques, are being developed but there is no consensus regarding criteria for patient selection for each type of treatment and insufficient guidelines as to how to measure outcomes of the interventions. The purpose of this paper is to determine if information is available to help develop protocols for care and treatment of patients with complex amputation injuries.

Clinical Outcomes: Medical literature was searched and programs were interviewed regarding types of advanced treatments used. How current surgical techniques can be modified to increase options for further and future reconstruction. Clinical case will be used for examples.

Results: Advanced therapy for severe traumatic injuries such as near amputations currently under development include: 1. Free flap reconstruction, including nerve repair and tendon transfer. Sometimes requiring bone graft or osteochondral allograft. 2. targeted muscle reinnervation (TMR); combined with sensory reinnervation (Star Wars) 3. osseointegration; and 4. limb transplantation. 5. Additional rehabilitation tools such as Computer Assisted Rehab Environment (CAREN = the Holo Deck)) can be used to provide additional rehab and functional assessment. (Star Trek)

4. Transition from Military to Civilian Life

55. Veterans' Health in Canada: a Scoping Review of the Literature

Aiken, A.B., Rose, S., McColl, M.A., and Carew, A.

Queen's University.

Introduction/Objective: The proposed project will involve a scoping review of the Canadian peer-reviewed and grey literature to identify the current state of the literature on Veterans' health in Canada. In light of the global explosion of expert opinion and research findings on veterans' health issues, this study examines the extent of the existing literature in the Canadian context. This study thematically identifies the state of the literature in order to inform researchers on potential knowledge gaps, and to determine emerging research trends on veterans' health in Canada.

Methods: The study employs a scoping review approach to scan an extensive body of literature to identify the state of the literature on veterans' health in Canada. According to Arksey and O'Malley (2005), the scoping review unfolds in 5 stages: 1. Identify the Research Question: What is the state of the literature on veterans' health in Canada? 2. Identify relevant studies. 3. Determine and apply inclusion and exclusion criteria. 4. Chart the data 5. Summarize and report the results.

Results: Out of a total of 234 articles, the most frequently studied health concerns are the following: 1. PTSD/ OSI/ Psychological Trauma (76 articles), 2. Transition/ Decompression/ Reintegration: (33 articles), 3. Veterans' Care needs (16 articles). Within the 'PTSD/ OSI/ Psychological Trauma' category, top themes include: 1. Treating PTSD (8 articles), 2. Association with Depres-

sion (6 articles), 3. Factor/ Symptom Structure of PTSD (5 articles).

Conclusion: It is expected that the results of this study will elicit the following: 1. A comprehensive database of literature relevant to the health needs of Canadian Veterans. 2. An identification of themes and research trends. 3. An identification of the gaps in the existing literature that may be relevant for study.

56. Successfully Transitioned Veterans: How They Did It

Black, T.

University of Victoria

Introduction/Objective: A national online non-governmental survey conducted by Dr. Tim Black at the University of Victoria found that almost half of CF Veterans surveyed felt they did not make a successful transition. The good news is that just over half reported they were able to make a successful transition to civilian life. The current study will interview 20 peer-nominate successfully transitioned CF veterans and ask them, 'How did you do it?' In the veterans' own words, the study will provide clues as to how we can better support military members as they make their transition to the civilian world.

Methods: Qualitative semi-structured interviews will be conducted with up to 20 peer-nominated successfully transitioned veterans. Data will be analyzed for patterns and themes in the veterans' responses.

Results: Results are pending, given that we are in the recruitment phase of the research. Given the author's connection with the veteran community and the proximity to Esquimalt Naval base, it is anticipated that recruitment will be successful in a fairly short period of time.

Conclusion: Uvic Human Research Ethics Board approval has been granted and we are currently embarking on recruitment. As such, conclusions are pending.

57. An Examination of the Association Between Physical Health Conditions and Anxiety in a National Sample of Veterans

El-Gabalawy, R., Thompson, J., Mackenzie, C., Erickson, J., Van Til, L.D.,

MacLean, M.B., Sudom, K. and Sareen, J.

University of Manitoba and Veterans Affairs Canada

Introduction/Objective: The complex transition from military service to civilian life can be characterized by compromised physical and mental health and decreased quality of life. However, there is a dearth of research examining the relationship between anxiety and physical health conditions among Canadian Veterans. The purpose of this investigation is to establish prevalence rates of anxiety and physical health conditions and to examine the comorbidity and associated negative outcomes of these conditions.

Methods: Participants were selected from the cross-sectional Survey on Transition To Civilian Life (STCL; $n=3354$, response rate=71%). The sample consists of former Canadian Forces Regular Force Personnel who were released from 1998 to 2007. Physical health conditions and anxiety were based on self-reports of having been diagnosed with a condition by a health professional. Logistic regression models examined the association between physical health conditions and anxiety disorders, and negative outcomes (i.e., restriction in activities and quality of life) associated with having these comorbid conditions.

Results: Preliminary results indicate that both anxiety (15%) and a variety of physical health conditions (5-49%) are common in the veteran population. We hypothesize that anxiety will be highly comorbid with several physical health conditions and that the comorbidity will likely be associated with negative outcomes.

Conclusion: This study fills an apparent gap in the literature and will have important clinical implications in identification and treatment of at-risk personnel and may play a role in guiding effective prevention initiatives.

58. Healthcare Management in the Canadian Forces Health Services (CFHS): A Comparative Study on Military and Civilian Health Management Skills

Gamble, B., Kapral, O., Manogaran, M. and Poisson, R.

University of Ontario Institute of Technology and Canadian Forces Health Services

Introduction/Objective: Two national surveys of Canadian civilian hospital and community healthcare managers ($N=622$) identified five categories of skills needed to lead successfully in the healthcare sector: system thinking, human resources, interpersonal and people skills, flexibility, communication skills, and change management. The policy question that arises: are the skills required to manage in the civilian sector similar to the CFHS or are there

differences. This is an important question for those serving in the CFHS and for Canadian Forces personnel transitioning to work in the civilian sector.

Methods: An electronic survey of CFHS managers is currently being conducted in partnership with the CFHS to determine views on the skills necessary to manage in healthcare. Data collection will be completed June 2012. The questionnaire includes items on employment/demographic characteristics, clinical background, and views on management skills. The responses for the question, "What do you feel are the top five skills/competencies needed to lead/manage successfully within the next 5–10 years" will be mapped against the National Centre for Healthcare Leadership's competencies. A comparison of the CFHS and civilian sector responses will be conducted to identify similarities and differences.

Results: Similar to other healthcare sectors, CFHS, experiences a number of challenges related to resources (e.g., time, funding and people). To address some of these challenges, the CFHS partners with a variety of civilian organizations, healthcare professionals and administrative managers for education/training programs, research and the delivery of services. While similar challenges do exist within both the CFHS and the civilian sector, some of the challenges experienced by the CFHS are unique.

Conclusion: Healthcare managers possess unique skills and expertise, which play a very important role in the delivery of healthcare services in terms of structural, financing, planning and professional issues. They are responsible for ensuring that healthcare providers have the necessary resources to deliver care and are an integral part of the healthcare workforce. Understanding the skills needed to manage in the CFHS and civilian sector will assist in addressing the challenges that are both similar and unique.

59. Gender Differences in the Transition from Military to Civilian Life

Hachey, K.

Director General Military Personnel Research and Analysis

Introduction/Objective: Although the transition from military to civilian life is an important time for veterans, there has been a lack of research in this area. More importantly, there is a need to provide evidence about the health requirements of veterans in order to help in their re-establishment into civilian life (Thompson et al., 2011). As more women are joining the military (Bean-Mayberry et al., 2010) and research has suggested that there are differences in health issues and health care utilization between males and females (Haskall et al., 2011), there is increased need to understand gender differences in transition experiences.

Methods: The Survey on Transition to Civilian Life (STCL) was developed to measure health and determinants of health of former Regular Force members who recently released from the CF between the years of 1998 to 2007 (Thompson et al., 2011). The survey was part of the Life After Service Studies (LASS) program of research, a collaboration between Veterans Affairs Canada, Department of National Defence, and Statistics Canada (Maclean et al., 2010). The goal of the current study is to conduct a secondary data analysis using the STCL to examine the gender differences in the transition from military to civilian life.

Results: The results from the current study will be available summer 2012. However, some initial hypotheses have been made. For example, as previous research has indicated that there are gender differences in health issues and health care utilization of military members (Haskall et al., 2011), it is hypothesized that there may be gender differences on other specific variables such as health, social support, etc. during the transition from military to civilian life.

Conclusion: The hope is that the current study will act as a base for future research to examine gender differences in the transition from military to civilian life and to help identify gender specific resources that may be needed in that transition. The presentation will focus on the gender differences on the transition from military to civilian life including general and mental health.

60. Overcoming Systemic Obstacles to Veteran Transition to Civilian Life

Dale-McGrath, S. and English, A.

Queen's University

Introduction/Objective: This research examines obstacles to veteran reintegration into society due to divergent expectations, between veterans and their families on one hand and the public and governments on the other, about the goals of veteran care and transition policies. It is based on new findings that suggest that obstacles encountered after the First World War parallel those identified in current debates surrounding the New Veterans

Charter and developing current government policy for veterans.

Methods: This research is based on an historical analysis of the obstacles to Canadian veteran reintegration caused by divergent expectations between those in need of support (veterans and their families) and those providing the resources for that support (the public and governments). The analysis examines the historical record for obstacles that are unique to certain historical eras and obstacles that transcend particular eras. This methodology focuses on identifying those obstacles that present persistent challenges to effective veteran care and transition and on using lessons from previous attempts to deal with these obstacles to overcome them in the future.

Results: Once common factors have been identified, mitigation strategies based on historical experience can be devised to minimize the obstacles to veteran reintegration that occur repeatedly. Initial results suggest that successful strategies included specific actions to reconcile the divergent views that arise in the post-conflict period. Implementing these strategies can result in broad support for a national agenda to address the specific needs of veterans and for developing effective policies for veteran care and transition to civilian life. Successful consensus building avoids drawn out conflict over what veterans require and results in meeting their needs quickly and appropriately.

Conclusion: Preliminary conclusions suggest there are some factors that create obstacles to Canadian veteran reintegration that are unique to particular times and others that are common to all times. They also suggest that divergent expectations among stakeholders creating policies for veteran care and transition increase once a particular conflict has ended. With the end of major Canadian combat involvement in Afghanistan, we already see signs of divergent expectations in this country. Therefore, we can anticipate the appearance of some of the same obstacles to Canadian veteran reintegration that we have seen in the past, as memory of that involvement fades.

61. The Association Between Income and Mental Disorders in a National Sample of Canadian Veterans

Klassen, K., El-Gabalawy, R., MacLean, M.B., Sareen, J. and Ready, E.

University of Manitoba and Veterans Affairs Canada

Introduction/Objective: The majority of large cross-sectional epidemiologic studies conducted with the general population suggest that low socio-economic status is associated with increased prevalence of mood and anxiety disorders. Furthermore, many veterans experience a change in their income during the transition from military to civilian life. However, the relationship between mental health and income of military personnel remains understudied in Canada. The objective of this research is to discern the relationship between both household and personal income and psychological well-being in terms of suicide ideation, suicide attempts, and mood and anxiety disorders.

Methods: Participants will be selected from the Survey on Transition to Civilian Life Survey (STCL; N = 4700, response rate = 71%). After adjusting for sociodemographic characteristics, multiple logistic regressions will be used to examine the association between income (both household and personal) and mental disorders and suicidality. Income will be divided into quartiles and crosstabulations will be calculated to determine the proportion of individuals in each quartile who self-reported a diagnosis of a mental disorder or endorsed suicidality. Military characteristics will be examined as possible mediators of the relationship between income and outcomes.

Results: Previous studies investigating the prevalence of mental disorders in the military suggest that Canadian regular force veterans are at higher risk of psychological distress in comparison to the general population. Furthermore, many Canadian Forces members in transition from military to civilian life routinely report low income. Extrapolating from the existing research, it is hypothesized that a positive association between income and mental disorders in the military will be discerned. A limiting value at which income is protective against mental disorders may also be established.

Conclusion: There is very little information available on the relationship between mental disorders, suicidality, and other negative outcomes and income status of military personnel as they transition to civilian life. This study will address this gap in the literature by examining the relationship between income and mental disorders, and other negative outcomes associated with low income status such as poor adjustment to civilian life, unemployment, and poor quality of life, amongst military veterans. This research is significant in the development of programming and policy that will assist at-risk personnel and guide effective prevention strategies such as suicide prevention initiatives.

62. Post-Military Adjustment to Civilian Life: Potential Risk and Protective Factors

MacLean, MB, Van Til, L.D., Poirier, A., Thompson, J.M., Sweet, J., Sudom, K. and Pedlar, D.

Veterans Affairs Canada and Department of National Defence

Background: A recent national survey of Regular Canadian Force Veterans found that a quarter reported a difficult adjustment to civilian life.

Objectives: The objectives of this study were to explore dimensions of post-military adjustment to civilian life and identify potential risk and protective factors.

Design: This study was secondary analysis of a cross-sectional survey.

Methods: A national sample of 3,154 Veterans released from the Regular Canadian Forces during 1998 to 2007 responded to the Survey on Transition to Civilian Life. The prevalence of difficult adjustment for selected demographic, military, health, disability, and determinants of health characteristics were examined and confidence intervals were calculated at the 95% level.

Results: The overall prevalence of difficult adjustment to civilian life was 25%, with variation from 11% to 85% for selected characteristics. Statistically different variation was found for age at release, marital status, length of service, release type, rank, service branch, number of deployments, perceived health and mental health, satisfaction with life, suicidal ideation, chronic conditions, smoking, low income, satisfaction with finances, mastery, satisfaction with job or main activity, sense of community belonging, social support and life stress. Variation from overall prevalence was not found for gender, years since release, drinking, education and health care access. **Limitations:** Findings cannot be generalized to all Veterans, many characteristics were self-reported, important characteristics may have been omitted and conclusions related to independent association and causality cannot be drawn.

Conclusion: Post-military adjustment to civilian life appears to be multidimensional suggesting the need for multidisciplinary collaboration between health care providers and agencies to improve transition. Many potential risk and protective factors were identified which can inform outreach strategies and screening activities and further research.

63. Post-traumatic Stress Disorder Symptom Clusters and Economic Status

Matteo, R. A.

University of North Carolina at Chapel Hill

Introduction/Objective: Clinical approaches are not the only need for individuals and families who face PTSD diagnosis. I explore financial consequences of PTSD in clients of Veterans Affairs Canada (VAC) to identify economic vulnerabilities of Veterans and inform policy development. PTSD is often chronic, requiring management over broad periods, often outside of the medical complex. A growing number of Veterans are young and searching for gainful civilian employment, yet at risk of disrupted work lives due to psychological disturbances. The goal is to inform clinical care and policy to enhance functional and financial well-being.

Methods: The data are VAC clients in the 1999 Canadian Forces Survey (CFS). Analyses are limited to men, because <5% of respondents were women, and it is assumed women experience military service, mental illness, and civilian employment differently. To investigate symptom clusters, I present descriptive analyses of VAC clients who meet diagnostic standards for any symptom cluster of PTSD (rather than the composite diagnosis). I conclude with confirmatory factor analysis to identify the best-fitting model of PTSD symptoms, differentiating between the 3-factor DSM-IV conceptualization and proposed 4-factor symptom models. Finally, SEM models test the association between unique clusters and economic outcomes.

Results: All DSM-IV symptom clusters are associated with decreased likelihood of working since release. Symptoms of intrusion (Criterion B) and hyperarousal (Criterion D) significantly relate to current unemployment. Hyperarousal is also significantly associated with job turnover. All criteria hold significant importance in relation to financial insecurity. One positive association is that PTSD (as composite or as unique symptom clusters) does not hold a significant relationship with decreased likelihood completing further education after release from CF. Finally, CFA modeling validates contemporary discussions of a need to reconfigure symptom clusters of PTSD, such that an additional diagnostic symptom cluster is warranted.

Conclusion: Findings illustrate PTSD holds significant association with

economic well-being, controlling for risk factors (including comorbidities). Assessing specific symptom clusters provides deeper understanding of policy and structural needs among those diagnosed. But, Veterans also experience symptoms of PTSD without meeting diagnostic clinical requirements, thus left untreated. Findings illustrate that symptom clusters of PTSD maintain significant (distinctive) relationships with economic outcomes. This supports contemporary psychometric assessments suggesting the diagnostic criteria require conceptual revisions, as supported by confirmatory factor analysis.

64. The Paradox of Military Training: Survival on the Streets Among Homeless Veterans

Ray, S.L., Haines, K. and Longo, S.

The University of Western Ontario

Introduction/Objectives: The purpose of this secondary analysis of the first national study on homelessness among Veterans of the CF and AF was undertaken to explore homeless veterans' survival on the streets as both helped and hindered by their military training.

Methods: An interpretative phenomenological approach was used as the methodology for the study. Although all 54 transcripts from the primary study were reviewed, 15 were chosen because these participants spoke extensively about their lives on the streets. Common themes were identified until an understanding of homeless veterans' survival on the streets was attained.

Results: Military training as a double edged sword for homeless veterans is the overarching analytical interpretation that emerged. Three subthemes: Military training prepares veterans for survival on the streets; military training to defend oneself with aggression if necessary and military identity when serving interrupts the development of an adult identity post military can make transitioning to civilian life difficult illustrate the paradox. Sub Theme I: Although their military training prepares them for survival on the streets such as sleeping rough, they may keep their distance from others and may therefore have difficulty in accessing services. Sub Theme II: The training to "fight" if directed onto civilian society can result in difficulties obtaining and retaining employment, difficulties in relationships and trouble with the law. Sub Theme III: Difficulties developing an autonomous adult identity as normal development is interrupted by military training that precludes independent decision making which is a required adult coping ability.

Conclusion: Health care service providers need to recognize, validate and respond to the effects, positive and negative, of life in the armed forces for homeless veterans in order to provide the best care. Building upon their strengths attained during their military training and education about conflict resolution, assertiveness, and the provision of counselling to build an adult identity post military are some of the implications from this study.

65. Who is a Veteran?

Van Til, L.D., Thompson, J.M., MacLean, M.B. and Pedlar, D.J.

Veterans Affairs Canada

Introduction/Objective: The objective of this paper is to provide guidance for researchers interested in using self-reported questions to identify Canadian Veterans.

Methods: The most current legislated definition of a Veteran is from the New Veterans Charter: "a former officer or non-commissioned member of the Canadian Forces (Regular or Reserve)". Core concepts of Canadian military service include military environment (navy, army, air), differing characteristics of the Regular and Reserve forces, and key dates of release and enrolment to determine the period of military service.

Results: Core concepts were incorporated into a series of recommended questions: Have you ever had any military service in the Canadian Forces? Was this service with the Navy? Army? Air Force? Reserves? Are you currently in the Canadian Forces? What year did you release from the Canadian Forces? What year did you join the Canadian Forces?

Conclusion: The use of these Veteran status questions cannot fully capture many important characteristics of prior military service. They can be used to self-identify Canadian Veterans. By including Veteran status questions, researchers will have a better understanding of their population of study, and can contribute to a better understanding of the ongoing effects of military service, improving the health of Veterans in Canada.

5. Social Health and Wellbeing of Active Duty Personnel, Veterans or Families

66. The Impact of Field Experience on Soldier's Identity and Well-Being As Unveiled by a Discourse Analysis Based on the Interviews of CF Members in Combat Arms

Belanger, S.A.H.

Royal Military College of Canada

Introduction/Objective: This paper analyses 30 interviews from service members in the combat arms who deployed to Afghanistan between 2002 and 2010. These testimonies were collected on three different military Bases across Canada between 2010 and 2011. It aims at exploring which factors influence the way these military personnel justify their mission in Afghanistan, more precisely, how they argue that the recourse to violence is the core of their mission and their job and how they measure its impact on their soldier identity and well-being.

Methods: These factors will be identified through a discourse analysis based on three main questions: what are the interviewee's military and personnel ethos (core values); what is their field experience (type of operation and tempo); and what is their perception of the importance of their role as Canadian Forces members in Combat Arms during their mission(s). These factors will be identified by the recourse to a tri-dimensional model that assesses, through a discourse analysis, the results identified as being essential to mission success based on: 1) Military ethos (Canadian values); 2) Field experience (operational tempo); and 3) Self representation as a soldier (health self-assessment).

Results: The multiple exposures of military members transitioning from combat arms to family life seems to be constantly lived at three levels: individual (core values), operational (mission's characteristics), and social (identification to soldier identity/warrior culture). Results from a discourse analysis of the experience of Canadian Forces members who were interviewed after deployment to Afghanistan tend to show that the individual soldiering identity and its impact on post deployment rehabilitation and combat readiness are often tied with self-health assessment. Once acknowledged, this tension is often resolved by readjustments in the soldiers' identification to their own war culture. It is this readjustment that seems to be a determinant in the soldiers' ability to gain back combat readiness.

Conclusion: The collection of testimonies of military members who have deployed overseas in various types of missions allows for a discourse analysis that unveils word after word the construction of a soldier identity, from its genesis and development through indoctrination (warrior culture), until its questioning after multiple exposures to combat arms, followed each time by an often challenging return home, including the reconstruction of this frail identity to the point of preparing again to build-up towards a combat readiness level.

67. La qualité de vie psychologique: étude sur deux mesures d'un échantillon de militaires des Forces Canadiennes affectés en Europe

Blackburn, D.

Canadian Forces / Université du Luxembourg

Introduction/Objective: Les FC en Europe comptent un contingent d'environ 600 militaires réparti dans 12 pays européens. L'action de déménager est considérée comme un des événements de vie les plus stressants. Lorsque le déménagement se fait à l'extérieur du pays d'origine, il y a lieu de croire que la vulnérabilité produite augmente. L'objectif est d'analyser l'évolution dans le temps des relations entre les autres dimensions de la qualité de vie (physique, relations sociales et environnement) et la capacité à gérer les problèmes, en fonction de la qualité de vie psychologique des militaires dans les premiers mois de leur affectation en Europe.

Methods: Un total de 176 militaires des FC ont été invités à participer à cette recherche. L'instrument de recueil des données est un questionnaire composé de questions fermées en anglais et en français. Cette recherche est longitudinale et s'avère un suivi de cohorte sur deux mesures avec un intervalle de trois mois (octobre 2009 et janvier 2010). Un modèle linéaire mixte a été développé pour prendre en compte les corrélations entre les mesures réalisées sur un même individu aux deux temps. Les réponses des participants ont été traitées avec le logiciel PAWS version 18.

Results: 39 militaires affectés en Europe en 2009 ont participé à l'étude. Leur âge moyen est de 40,9 ans et ils ont en moyenne 19,6 années de services au sein des FC. Leur perception de leur qualité de vie psychologique ne semble pas fluctuer de manière importante au cours des six premiers de la mutation

en Europe. Certaines variables (« santé physique » et « relations sociales » du Whoqol-bref et « acquisition de soutien social » et « recadrage » des capacités à gérer des problèmes) ont des effets significatifs sur la perception de la qualité de vie psychologique.

Conclusion: Pour les FC, la poursuite des recherches dans le domaine de la qualité de vie des militaires semblent être une avenue prometteuse pour mieux saisir et comprendre les réalités psychosociales actuelles. Que les militaires soient affectés en Europe ou encore qu'ils soient déployés pour une période de six mois en Afghanistan, la mesure de la qualité et l'étude des facteurs ayant un impact sur cette dernière permettra de mettre en place des programmes de prévention primaire qui pourront améliorer les conditions de vie et de travail et au bout du compte la qualité de vie.

68. Evaluation of the Canadian Forces Stress: Take Charge! (STC) Program: Analysis of Short-Term Participant Outcomes

Born, J., Lee, J.E.C. and Dubiniecki, C.

Directorate of Force Health Protection

Introduction/Objective: In the military context, stress may lead to reduced morale, absenteeism and decreased operational readiness. 'Stress: Take Charge!' (STC) is a structured program that was designed to teach Canadian Forces (CF) personnel and their families their about stress, and improve their readiness and ability to manage it. Based on the cognitive-behavioural paradigm, STC emphasizes individuals' appraisals of stressful experiences and how these may help them select healthier, more effective stress management strategies.

Methods: A comprehensive evaluation was launched in October 2011 to assess the implementation and effectiveness of the STC program. STC program participants were surveyed at baseline, upon course completion and during a 6-month follow up. Data from each collection phase are being analysed to quantify both short- and long-term changes in participants' knowledge of stress and stress management, readiness for improving their stress management skills, use of stress management strategies, well-being, and satisfaction with the program. Changes in the use of various stress management strategies, while taking stress appraisals into account, will serve as the primary outcome.

Results: The majority of STC participants have been Regular Force members, with an overrepresentation of women. Full results of analyses comparing data collected at baseline and after the course will be available in Fall 2012 for the following outcomes: knowledge, readiness, stress management skills, appropriateness of coping and well-being. Findings will therefore provide input on the short-term effectiveness of the STC program.

Conclusion: The aim of this analysis will be to assess the effectiveness of the STC program for improving participants' knowledge of stress and stress management, use of stress management strategies, and well-being. In addition to providing valuable information on the short-term effectiveness of the STC program, this analysis will help to establish the focus of subsequent analyses involving follow-up data. Although the approach used in this evaluation was designed specifically for the STC program, the processes can be applied to guide the development of future program evaluations in other military and civilian contexts.

69. Coming Home to a Safe Haven That Heals: Working With Military Couples in Therapy and Educational Groups

Wiebe, J. S., Kennedy, N., Weissman, N., Rheem, K. and Johnson, S.

University of Ottawa, VA Maryland Healthcare System, Baltimore VAMC, Washington Baltimore Center for EFT

Brief Description: Emotionally focused couple therapy (EFT) is the gold standard as far as empirically tested couple interventions. This is an attachment based approach that fosters not only increased relationship satisfaction but the more secure bonding that promotes resilience and recovery from post-traumatic stress. There is solid evidence that while marriage breakdown triggers and exacerbates mental health problems, a positive loving relationship is a preventative and healing factor for such problems. EFT has been used extensively and tested with couples facing different kinds of traumatic experience.

Clinical Outcomes: This presentation will include the results of two recent pilot studies of EFT, a short term approach found to be extremely effective in increasing relationship satisfaction and creating the secure bonds that foster healing from depression and anxiety. Data was collected on short-term EFT at the Baltimore VA hospital and 15-hour educational preventative EFT groups for post-deployment couples created at the request of the US

Army Chaplains office. Outcomes measured include relationship satisfaction, trauma symptoms, quality of life and preliminary satisfaction ratings of post-deployment groups.

Patient Population: For this specific presentation, data was collected from post-deployment military couples. EFT has been found to be effective with a range of couple populations including couples with physical health concerns, chronically ill children, symptoms of trauma and depression.

70. E=MC³: A Therapeutic Program for Families Dealing With an OSI (Operational Stress Injury)

Kohler, N., Nadeau, B. and Wigfield, R.
Centre de la famille Valcartier

Brief Description: The E = MC³ therapeutic program focuses on children ages 7 through 12 who live with an Operational Stress Injury (OSI)-affected parent, but the overall purpose of the group intervention approach is to develop the strengths of each family member in order to improve their individual well-being and the well-being of the family as a whole. The program's goal is to end family members' isolation, help children and parents to better understand OSIs and their effects on the family, promote communication within the family, improve relationships between parents and children and help prevent mental health and family violence problems.

Clinical Outcomes: At the end of the program, families expressed the following results: 1) children expressed themselves more and felt less guilty, 2) children had a better understanding of an OSI, 3) communication within their family had improved with tools provided, 4) they came to realize that it was still possible to have a good time as a family, 5) they were no longer isolated, 6) children realized that they could not cure their parent. Although the results are more qualitative in nature, there is potential for researchers to evaluate the program with added psychometric tools.

Patient Population: The E = MC³ program was built to meet the needs of military families and has been offered twice to the community of the Canadian Forces military base in Valcartier, Quebec. It has since been nationalized so that all the Military Family Resource Centers across Canada can offer the program as well. The two groups in Valcartier consisted of 4 families each. The first group had children aged 9-12 and the second, children aged 6-10. The program has 6 workshops for children, 3 for parents and two for the family as a whole.

71. Post-Deployment Reintegration Experiences of Canadian Forces Reservists and Augmentees

Pickering, D.

Defence Research and Development Corporation

Introduction/Objective: After military members return from a deployment they need to adjust to being back in Canada, being back with their friends and family, and returning to work. There is also personal reintegration that needs to take place (i.e., feeling like they are themselves again). Much of the past research on post-deployment reintegration has focused on the experiences of Regular Force members who have deployed as a part of a formed unit. How does the reintegration experience of Reservists and Augmentees (i.e., Regular or Reserve Force member not deployed as a part of a formed unit) compare?

Methods: Interviews were conducted with Canadian Forces members, primarily Reservists and Augmentees, who had returned approximately 10-12 months following a deployment to Afghanistan. They were asked to describe any positive and negative reintegration experiences they had with respect to: the personal domain (i.e., feeling like themselves again), interpersonal domain (i.e., family and friends), and work reintegration. They were also asked to indicate any factors they thought either facilitated or hindered their reintegration process. Themes emerging from participant responses to these questions were ascertained.

Results: The post-deployment reintegration process of Reservists and Augmentees may differ from Regular Force CF members who have deployed as a part of a formed unit. For example, they may encounter challenges to their successful reintegration back into work (e.g., issues with social support). Along with these challenges, a discussion of the factors provided by Reservists and Augmentees that facilitated or hindered their reintegration experiences will occur.

Conclusion: This research provides valuable insight into the unique post-deployment reintegration challenges faced by Reservists and Augmentees who have returned from a recent deployment. As well, this research is important as there has been limited research conducted on this topic, especially for a

deployment such as Afghanistan, i.e., the role of Canada in Afghanistan has been characterized as complex, in that its role as a part of the North Atlantic Treaty Organization (NATO) has been to provide security, ensure stability, and aid in the reconstruction of the country (NATO, 2007).

72. Life Satisfaction among Canadian Forces Members

Skomorovsky, A.

Department of National Defence

Introduction: The demands of military life may have a negative impact on the overall life satisfaction of military personnel, which, in turn, may lead to attrition and psychological health problems. Therefore, it is important to identify the main factors that predict life satisfaction among military personnel. This study examined the life satisfaction of Canadian Forces (CF) members. Seven domains previously associated with life satisfaction were examined, including material well-being, health, occupational satisfaction, family satisfaction, psychological well-being, safety, and community satisfaction. This study hypothesized that these factors jointly predict life satisfaction among military members.

Methods: An analysis was carried out on data from 633 randomly selected CF Regular Force members from three military bases (Petawawa, Halifax, and Cold Lake). The analysis involved three steps. First, multiple regression analyses were conducted to examine the role of the domains that have been associated with life satisfaction in the literature. Second, a sequential clustering approach was used to determine the number of clusters in life satisfaction of CF members. Finally, a hierarchical regression analysis was conducted to assess whether the relationship between cluster membership and life satisfaction changed across military bases.

Results: The results revealed that standard of living, physical health, satisfaction with military life, relationship satisfaction, depression, and social support uniquely predicted life satisfaction when other domains were statistically controlled for. Furthermore, the results suggested the suitability of a two-cluster solution, where 204 participants were classified into a low level life satisfaction profile and 429 participants into a high level one. Finally, the results revealed that while both cluster membership and military base predicted life satisfaction, the interaction between cluster membership and military base was not significant.

Conclusion: The present study assessed life satisfaction among CF personnel using a model comprised of seven domains that have been associated with life satisfaction in the literature. These domains were found to play a more important role in the life satisfaction of military members than the characteristics of a particular military base. The proposed model offers a useful approach for developing policy and intervention strategies and for improving support services tailored to enhancing life satisfaction in the military context. Future research should examine the mechanisms that contribute to life satisfaction among military personnel.

73. Evaluation of a New Post-deployment Educational Program

Zamorski, M.A., Guest, K., Bailey, S. and Garber, B.G.

Canadian Forces Health Services Group

Introduction/Objective: Programs such as Canada's Third-location Decompression (TLD) program are designed to ease reintegration after difficult deployments. The educational component of Canada's TLD previously used an evidence-based US program (BATTLEMIND). In 2010, Canada introduced a new educational program. Key enhancements included a slightly longer duration, the use of a clinician and a non-clinician as instructors, more emphasis on recognition of mental health problems, more content on overcoming barriers to care, and a greater emphasis on social determinants of well-being. The objective of this study is to assess the perceived value and impact of the new program relative to the old one.

Methods: Subjects were 22113 personnel participating in TLD after deployment in Kandahar, Afghanistan; 3024 received the new program. A quasi-experimental approach compared outcomes under the new vs. old programs. Subjects completed a voluntary post-TLD evaluation capturing the perceived value of the education program and of TLD as a whole, along with questions on attitudes towards mental health and self-efficacy about managing transition problems. Logistic regression was used to explore the association of the new program with outcomes.

Results: The overall response rate was 78%. Those completing the new program were significantly more satisfied with the TLD educational program (adjusted odds ratio, 3.8, 95% confidence interval = 3.2 – 4.5), and they perceived the TLD as a whole to be more valuable (adjusted OR = 1.8, 1.6 –

2.0). Nearly all attitude and self-efficacy items at the end of TLD favoured the new program, with Cohen's *d* (a standardized measure of effect size) ranging from -0.03 to +0.34. Those who had previously completed the old program found TLD under the new program to be significantly more valuable.

Conclusion: All indicators point to the clear and substantial superiority of the new educational program over the old one. The primary limitation of this analysis is the use of a quasi-experimental approach: It is conceivable that the observed differences were due to factors other than the change in the educational program. In addition, we measured only short-term educational outcomes rather than longer-term impacts on the transition process or on well-being. Notwithstanding these limitations, the CF views this as sufficiently strong evidence to support the continued use of the new program.

74. The Brain Injury Association of Canada and Its Role in Canada *Zarins, H.*

Brain Injury Association of Canada

Brief Description: The Presentation will describe the role of the association in Canada and how it supports veterans and their family members.

Clinical Outcomes: Knowing about the resources available through the grassroots on the association can support veterans who have PTSD and / or brain injury as a result of blasts or duty injuries.

Patient Population: BIAC and its grassroots have reached out to Canadians and will support those who seek out support.

6. Occupational Health

75. Occupational Therapy: A Canadian Legacy of Past, Present and Future Practices With Military Personnel

Beshay, M. & Rexe, K.

Canadian Association of Occupational Therapists

Introduction/Objective: The origin and development of the occupational therapy profession is closely tied with the military. In 1915, the Military Hospitals Commission was created to address the needs of returning injured soldiers. "Ward Occupation Aides" facilitated the re-entry of veterans within their communities and assisted them in identifying occupations to allow them to participate in their social constructs. Almost a century later, occupational therapists continue to empower military personnel and their families to fully engage in the occupations that they want and need to do. This presentation will highlight the legacy of occupational therapists and their continued involvement with military personnel.

Methods: An extensive review of the history and literature examining the role of occupational therapists then and now with military personnel was completed. In addition, a comprehensive research synthesis was conducted to identify studies which examine the economic evidence related to occupational therapy interventions, and other rehabilitative interventions that fall under the same professional scope of practice. A partnership with occupational therapists working with soldiers and veterans allowed for a better understanding of the application of theory to current practices and future possibilities.

Results: There is growing evidence that identifies the value of occupational therapy interventions in both economic and functional outcomes. Occupational therapists are involved with military personnel in services that span the continuum of care ranging from mental health to physical rehabilitation and community re-integration. Occupational therapists' involvement in the military continues to provide a vital service in helping soldiers, veterans and their families engage in meaningful occupations and identify the right balance between social, environment and personal needs. The areas of potential growth will be discussed.

Conclusion: Canadian Forces personnel seeking to re-engage in their occupations and environment may continue to address those needs with occupational therapists. Occupational therapists understand the dynamic between the various components that impact successful engagement in meaningful occupations and have the tools to empower military personnel to pursue their needs and wants. The involvement of occupational therapists remains integral to the occupational health of military personnel.

76. CF Community Approach to Musculoskeletal Injury Prevention in Sports and Physical Activity

Laferrière, L. and Ménard, D.

Canadian Forces Health Services

Brief Description: 50% of CF injuries occur during sport and physical

fitness training activities and this has a significant impact on deployability (HLIS 2008). In 2008, a national working group (WG) was formed with wide representation from CF injury prevention (IP) stake holders. With the support of this WG, an IP program was launched in October 2010. Education alone has not been shown to prevent injuries, so this program utilizes an organized community-based approach that includes early communication with leaders and partners and monitored the program with feedback forms.

Clinical Outcomes: Six months after its launch, 17 of the 26 HP offices met with their key leaders and partners: PSP Managers (61%), Senior Physiotherapists (35%), Base/Wing (B/W) Surgeons (22%), B/W Administrative Officers (22%), General Safety Officers (21%), Senior Dental Officers (18%), Clinic COs (18%) and B/W Commanders (16%). All key leaders and partners expressed high motivation to support the program: averaging 8.5 on a 10-point scale. Furthermore, twelve of the HP offices were able to brief a total of 99 fitness personnel, 41 health care providers, 26 military unit commanders, 22 physiotherapists and one dental staff member. These leaders and partners also expressed a high motivation to promote the adoption of IP strategies. With this assessment, HP offices identified strategies used to reach their local leaders and partners and identified IP initiatives adopted at their base/wing.

Patient Population: This program aims to increase knowledge about CF injury statistics and evidence-based practices in IP. It also aims to reduce the incidence of CF injuries by motivating CF leaders, partners and personnel to adopt effective injury reduction strategies.

77. Considerations in Risk Assessment of Occupational Exposure to Contaminated Soils

Reimer, K.J., Koch, I. and Paquin, V.

Royal Military College of Canada

Introduction/Objective: Over the last decade efforts have been made to assess the potential health risks for CF members who might be exposed to industrial chemical contaminants during deployed operations. Samples, such as soil, are collected and sent to the Royal Military College for analysis. Current practice makes extensive use of comparisons of environmental conditions to guideline values; this approach is useful when chemical concentrations are lower than guidelines since negligible risk can be assumed. When guidelines are exceeded, however, there is often the perception of risk when none may exist. In such instances, risk assessment can provide valuable insight into the actual effects from chemical exposure.

Methods: In our research we have been working towards the development and acceptance of methodologies to improve risk assessment. The approach is based on lab measurements of the bioaccessibility, the amount of the chemical that can be dissolved in the human gastrointestinal tract and enter the blood stream. Such measurements are increasingly accepted by Health Canada for estimating human health risk. Guidance for the use of this approach in Canada have been developed by consensus in the research consortium Bioaccessibility Research Canada (BARC) thereby ensuring high acceptance within the country and internationally.

Results: Examples of bioaccessibility applications to risk assessment, methodological considerations, and guidance will be given. It is now known that only a small fraction of many industrial contaminants in soil actually enter the blood stream; most pass through the body without causing harm. Guidelines are derived assuming 100% absorption into the body; hence the reason that a guideline exceedance does not equate to risk as is often thought.

Conclusion: Not only do these measurements improve predictions of actual, rather than perceived, health risks, they can be retroactively applied to archived samples from deployed operations, thereby eliminating concerns that veterans may have about past contaminant exposure. Furthermore, the concept is easily understood by the layman and can assist greatly in risk communication efforts.

78. Essential Task Identification For Military Occupations Using the Triage Technique

Théoret, D., Mattie, P. and Spivock, M.

Canadian Forces

Introduction/Objective: Health and fitness research in the Canadian Forces (CF) often requires the opinions of subject matter experts. The process of integrating diverging views in order to obtain a group consensus can pose a challenge to researchers. The Technique for Research of Information by Animation of a Group of Experts (TRIAGE) is a method of data collection

based on the attainment of group consensus (Plante & Côté, 1993). This research group has enhanced and adapted TRIAGE to include an interactive visual aid in research initiatives requiring consensus by groups of military personnel, mainly in the identification of essential job components.

Methods: TRIAGE is comprised of three formal and distinct steps. In the first stage, individuals are identified as Subject Matter Experts (SMEs) for a particular CF occupation or field. Next, background information is prepared and distributed to each SME, well in advance of the meeting. At this stage, SMEs may be asked to refine a list of tasks on their own or reflect on the occupation or scenario at hand. The final stage involves an interactive group meeting of SMEs, during which they are tasked with identifying, by consensus, the common and essential tasks representative of their occupation.

Results: Employed in the Occupational Fitness Standards (OFS) Project, as well in the development of CF-wide fitness standards, the TRIAGE process has consistently resulted in the efficient creation of concise lists representing common and essential tasks. Furthermore, the technique has reliably allowed for the organization of extensive volumes of information into concise and manageable task lists within one-day group data collection.

Conclusion: The TRIAGE technique has shown to be highly applicable and effective in research requiring consensus by groups of military personnel. The effectiveness of the process appears to be affected by several factors. First, group interaction and active participation by group members is imperative. Secondly, as recommended by Gervais & Pépin, (2002), the TRIAGE group must be managed by a group facilitator who is competent in group dynamics and group management.

79. Effects of Fatigue Induced by 24-Hour Total Sleep Deprivation on Cognitive Function: an fMRI Study

Vartanian, O., Nakashima, A., Jobidon, M.E, Bouak, F, Peng, H.T., Smith, I., Lam, Q., Paul, M., Caldwell, L. and Cheung, B.

Defence Research and Development Canada

Introduction/Objective: Cognitive performance decrements as a result of fatigue constitute an important operational hazard for the Canadian Forces. An important contributor to fatigue is sleep loss. The aim of this study was to examine the behavioural and neural effects of 24-hour total sleep deprivation on cognitive performance. Furthermore, rather than focusing on vigilance—a traditional dependent variable for studies of sleep deprivation—we focused on a novel problem solving task loading on executive function—shown to engage the frontal lobes.

Methods: Members of the Canadian Forces (N = 13) were scanned twice in the functional magnetic resonance imaging (fMRI) scanner—once in the morning after a full night of sleep deprivation and once in the morning following a full night of sleep. Order of treatment was counterbalanced across participants. All participants were equipped with an actigraph for a week prior to data collection in the fMRI scanner, to enable assessment of sleep quality. We also collected self-reports of fatigue (Multidimensional Fatigue Inventory) and assessed all subjects on fluid intelligence—to assess whether it moderates the effect of fatigue on cognitive function.

Results: Data collection was completed in March 2012. The behavioural and neural data are currently under analysis. Analyses to address the following hypotheses will be of key interest: (1) is performance on the novel problem solving task impaired following sleep deprivation? (2) are the frontal lobes recruited more during novel problem solving following sleep deprivation? (3) does fluid IQ moderate the effect of fatigue on cognitive function? (5) are self-reports of fatigue (Multidimensional Fatigue Inventory) accurate predictors of performance?

Conclusion: The results from the current study will enable us to assess the impact of 24-hour total sleep deprivation on cognitive function on a task known to load on executive function, specifically working memory. They will also assess the utility of fluid IQ as a moderator of the effect of sleep loss on cognitive function. The data from this study will contribute to the development of behavioural interventions to mitigate the impact of fatigue on performance.

7. Evolving Treatment Programs and Clinical Practices

80. Assistive Robotic Arm for Upper Body Disabled Persons

Bérubé, C., Smith, E.J. and Courchesne, C.E.
Canadian Forces

Brief Description: JACO, from Kinova, is an assistive robotic arm for upper body disabled persons in powered wheelchairs. Its unique features will help

clients to push the boundaries of their limitations and better equip them to live in a world of obstacles. Six-axis robotic arms equipped with a three-fingered controlled hand are actively being tested with soldiers and veterans over a year-long period. Clinical findings from this initiative will be discussed and reviewed. The testing is done in collaboration with Kinova.

Clinical Outcomes: DASH (Disabilities of the Arm, Shoulder and Hand) TEMPA (Test Évaluant la performance des Membres supérieurs des Personnes Âgées) Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) Psychosocial Impact of Assistive Device Scale (F-PIADS) Interviews.

Patient Population: Six soldiers or veterans in powered wheelchair.

81. The Development and Implementation of New Applications For the Computer Assisted Rehabilitation Environment (CAREN)

Bridgewater, C., Balmer, S., Paquin, M.A., Seguin, M., Cotle, M. and Smith A.
The Ottawa Hospital Rehabilitation Centre

Brief Description: The presentation will describe the development of new applications for the Computer Assisted Rehabilitation Environment (CAREN). The developments were based upon clinical needs identified by Physiotherapists and Occupational Therapists. The needs identified included: more realistic terrain to challenge both static and dynamic balance control, introduction of distractions into the environment to challenge reaction time and reflexes, and navigation of complex, busy environments for both physical and cognitive rehabilitation. Case studies of clients with diagnoses of acquired brain injury and major trauma/amputation will be used to demonstrate the efficacy of the new applications.

Clinical Outcomes: The approach to application development used a Continuous Quality Improvement methodology (Plan, Do, Study, Act) the measures used to evaluate the implementation of the new applications were and continue to be subjective feedback from both the therapists and clients who have used the system. The measurement consists of satisfaction, engagement in treatment and clinical efficacy. Response to treatment will be monitored and reported through utilization data, such as treatment intensity, duration and personal goal attainment.

Patient Population: To date the patients from the following populations have used the CAREN system and new applications for treatment: all levels of lower extremity unilateral and bilateral amputations, major physical trauma including bone, nerve and soft tissue injury, complex regional pain syndrome (CRPS), brain injury (both acquired and traumatic), patients with Spinal Cord Injury, (incomplete injuries both quadriplegic and paraplegic), and other neurological injuries or illnesses (central and peripheral symptoms).

82. Optimizing Pathways of Care: for the Treatment of Complex PTSD with the Military and RCMP

Boucher, S. and Clark, C.

Carewest Operational Stress Injury Clinic

Brief Description: At the Carewest OSI Clinic in Calgary, AB we treat Military and RCMP who often present with complex PTSD. What are the most effective clinical methods of assessment; stabilization; treatment planning with this specialized population? We are creating a clinica care model which utilizes Kitchur's EMDR Developmental Strategic Genogram Model for assessment and O'Shea's EMDR Emotional Regulating Method for stabilization. The question becomes how to assess and develop a comprehensive treatment plan for Complex PTSD which addresses the needed emotional repair; developmental arrests; attachment patterns. Utilizing O'Shea's Emotional Stabilization EMDR model is an effective protocol which supports the emotional repair prior to engaging in evidence based treatments for PTSD (EMDR; Prolonged Exposure; CBT) required to reduce PTSD symptomology regarding re-experiencing; avoidance and hyperarousal. This integrated model of care, with preliminary psychometric testing will be presented with case study application and discussion.

Clinical Outcomes: 1. Depression 2. Anxiety 3. Avoidance 4. Re-experiencing 5. Hyperarousal

Patient Population: Client population this model of care has been utilized with are OSI Military and RCMP, serving and veterans.

83. Cranial Electrotherapy Stimulation in the Treatment of PTSD

Douglas, J.

Private Practice

Although it remains unknown by most mainstream practitioners, Cranial

Electrotherapy Stimulation is a valid treatment for pain, insomnia, depression, and anxiety. There are five decades' worth of research into its efficacy, and it has been recognized as a safe intervention by the FDA. I will argue that this technique deserves to be much better known in Canada. It has the potential to be of benefit to Veterans, particularly those who may be resistant to medication or who may have a history of addictions. It could even be used effectively on tour by active Military personnel. I will review the research supporting its use, explore barriers to its adoption as a mainstream technique, and examine current controversies, including the recent FDA review which found the research to be inadequate. I will mount a defense of the available CES research, while calling upon those present to consider pursuing further research in this exciting area.

84. The Road to JTF NIJMEGEN 2012: The Soldier on Team

Besemann, M., Hazledine, N.J., Godsell, P. and Heber, A.

Canadian Forces Health Services HQ

Brief Description: The CF Physical Rehabilitation and Mental Health Programs collected clinical data with the intent to identify trends as predictors of success during this ground-breaking initiative.

Clinical Outcomes: 2-day, back-to-back 5km, 10km, 20km, 30km and 40km marches; Outcome Questionnaire OQ-45.2; PTSD Checklist; The Alcohol Use Disorders Identification Test; Fear Avoidance Belief Questionnaire (Physical Activity & Work); Lower Extremity Functional Scale; Modified Oswestry Low Back Pain Disability Questionnaire; Roland Morris Questionnaire; Comprehensive High Activity Mobility Predictor; Functional Movement Screen; Sorensen; Hand Held Dynamometry; BDI-II; The Activities-Specific Balance Confidence Scale; Houghton Score Questions; and CAREN. **Patient Population:** Soldier On Nijmegen team; first time participant, active duty CF members with NMSK (including traumatic amputation), and Mental Health conditions all with a goal to complete the Nijmegen event. N=9-16 participants.

85. Comparison of Two Conceptually Different Methods to Treat Insomnia Among Veterans With PTSD: CBT For Insomnia (CBTi) Versus Mindfulness Based Stress Reduction (MBSR)

Gosselin, A., Robertson, C., Bertrim, S., Bryers, F. and Shlik, J.

Royal Ottawa Mental Health Centre

Introduction/Objective: Among veterans, sleep complaints are particularly prevalent and significantly higher for veterans with PTSD. Cognitive Behaviour Therapy for Insomnia (CBTi) is the treatment of choice for insomnia. However, there is evidence that Mindfulness Based Stress Reduction (MBSR) improves sleep quality and PTSD symptoms. This study intends to compare the impact of these conceptually different treatments on symptoms of insomnia, a frequent residual problem among veterans with PTSD, in order to improve prognosis and clarify the relationship between sleep disruptions and PTSD.

Methods: A permuted block randomization design will be used to compare the effectiveness of groups (CBTi vs. MBSR). Participants diagnosed with PTSD will be stratified by use of medication (yes/no) and age (18-36 or 37 and older) and assigned to 8-week CBTi or MBSR group. 24-hour actigraphy and sleep logs will measure changes in the sleep-wake pattern, and questionnaires (i.e., Insomnia Severity Index (ISI), Pittsburgh Sleep Quality Index (PSQI); Beck Depression Inventory-II (BDI-II); Beck Anxiety Inventory (BAI), PTSD Checklist – Military Version (PCL-M)), administered at three different times (pre-post and 6-month follow-up), will measure change in symptoms.

Results: We hypothesize that MBSR will be as effective as CBTi in leading to reductions of core symptoms of insomnia immediately following treatment and at 6-month follow-up. We also hypothesize that CBTi and MBSR will equally improve symptoms of PTSD, depression and anxiety immediately following treatment and at 6-month follow-up. Finally, we expect that sleep quality will mediate any improvement in PTSD symptoms as well as depressive and anxiety symptoms. Importantly, only preliminary data might be available in November 2012.

Conclusion: PTSD is common among veterans. Veterans with PTSD are at risk for co-morbidity and maladaptive functioning. Veterans with mental health problems are often reluctant to reach out for help because they fear a diagnosis of PTSD. Treating insomnia can be a foot-in-the-door for treatment-resistant veterans with PTSD. The conceptual and service delivery differences between the two interventions (i.e., CBTi and MBSR) could offer different options to veterans depending on their style, treatment preference and symptoms severity.

86. Telemedicine Enhanced Care for OSI's: Client and Clinician Satisfaction Survey

Hale, S., Bhatla, R., Shlik, J., Hammond, N. and Robertson C.

Royal Ottawa Mental Health Centre

Brief Description: The private and sensitive nature of an OSI could deter clinicians from considering telemedicine as a service delivery option. However, the Ottawa OSI Clinic (OSIC) recognized studies that indicate the earlier help is sought, the better one's recovery can be. Given that the Ottawa-based clinic serves clients throughout Eastern and Northeast Ontario, Nunavut, and Western Quebec, the clinic designed a treatment program that relies on Telemedicine service delivery to increase access to services in a timely, flexible, and safe delivery method. To date, the Clinic has provided services to over 500 veterans, soldiers, RCMP members and their families.

Clinical Outcomes: Telemedicine was integrated as an inter-professional service delivery model in 2010. It will soon surpass 500 live tele-video consultations through Telemedicine, becoming a leader within the national OSI network. All evidence-based assessment, treatment, follow up, consultation and groups services are offered and delivered through Telemedicine and include specialized treatments for Prolonged Exposure, Cognitive Processing Therapy and supportive counseling to spouses. 100% of clients (N31) surveyed were satisfied with the treatment they received via telemedicine while clinicians (N74) were 95% satisfied with the treatment they provided via telemedicine.

Patient Population: Clients, who are referred by Veterans Affairs Canada (VAC), Department of Defense and RCMP, and clinicians of the OSIC were surveyed over a 3 month period on each telemedicine intervention. The OSIC, which is funded by VAC, is an interdisciplinary team comprised of psychiatry, psychology, social work and nursing. Information on use within each discipline will also be presented. 7 sites within Ontario partnered in this survey and facilitated the communication of results back to the clinic and feedback on results specific to each site will be brought back to individual sites.

87. Findings of the Canadian Forces Expert Panel on the Prevention of Family Violence

Jetly, R.

Canadian Forces Health Services

Introduction/Objective: Family violence (FV) is an important public health problem in the Canadian general population. In military organizations, FV may have special significance: Military deployments may increase the risk of family violence, with mental health problems or failure to adapt combat behaviours to the home setting serving as mediators. Other aspects of military service may contribute to family conflict, a known contributor to FV. Moreover, military organizations may have unique opportunities for the prevention of FV. The purpose of this paper is to summarize the findings of the Canadian Forces Expert Panel on the Prevention of Family Violence.

Methods: The CF Expert Panel on the Prevention of Family Violence reviewed data on the magnitude of the FV problem in the CF, identified best prevention practices through review of the literature, evaluated the CF's prevention practices against these, and made recommendations for improvement. The Panel developed a model of targets for preventive intervention, including 1) "Fundamentals," such as governance, policy, attitudes fostering prevention, and excellence in service delivery; 2) "Risk Factor Reduction," at the level of the individual, family, workplace, and community; and 3) "Intervention for Identified FV Cases," to include services and supports for victims and perpetrators.

Results: Available data suggests that the prevalence and correlates of intimate partner violence (IPV) in the CF is similar to those in general population. IPV in the CF spans a broad spectrum, and CF members are both perpetrators and victims. Deployment is at most a small contributor to family violence in military organizations. For IPV prevention, the best evidence rests with school-based programs to prevent dating violence. For child maltreatment (CM) prevention, it rests with intensive nurse home visitation programs for high-risk newborns. Neither of these approaches is directly applicable to the CF's context.

Conclusion: The Panel concluded that the CF has strong programs in risk-factor reduction. Greatest attention is needed to "Fundamentals" of prevention: The Panel found evidence of uneven compliance with the CF's family violence policy, recommending a systematic compliance audit and revision as needed. The CF's Family Crisis Teams are well-situated to respond to

identified cases of family violence, but system-wide data is needed on their activities and performance.

88. Length of Treatment in an Outpatient Clinic For Serving and Veteran Military and RCMP Members

Laforce, J.C. and Whitney, D.L.

University of Manitoba

Introduction/Objective: The Winnipeg Operational Stress Injury (OSI) Clinic (opened in 2004) provides mental health assessment and treatment services to Serving and Veteran Military and RCMP members. Clients may engage in a variety of therapeutic protocols over the course of treatment, resulting in treatment length that is mutually regulated by clinicians and clients. To date, treatment outcome studies using military and veteran populations provide information about treatment effectiveness but little is known about typical treatment length and the factors that predict increased treatment sessions in the outpatient environment.

Methods: Standardized information is collected on all OSI Clinic clients at intake and symptom severity is assessed every three months using screening measures of depression (BDI-II), anxiety (BAI), and Post-traumatic Stress Disorder (PCL-M). Over 95% of clients approached have agreed to allow this clinical information also to be used for research purposes. Accordingly, over 250 files of discharged OSI Clinic clients were reviewed for treatment variables (i.e., number of sessions, professions involved), clinical variables (i.e., diagnosis, initial symptom severity, symptom improvement with treatment) and demographic variables (including referral source, number of deployments, age, employment status at intake).

Results: The first part of the analyses will present descriptive information about number of treatment sessions and how that differs significantly across clinical and demographic variables. The second part of the analyses will use a series of multiple regressions to explore the predictive value of these variables when multiple factors are considered. Specifically, we expect both diagnostic complexity (number of diagnoses; presence of identified Axis II diagnosis) and initial symptom severity to predict greater number of sessions. However, we believe the proportion of variance accounted for by initial symptom severity will decrease significantly once diagnostic complexity is accounted for.

Conclusion: Implications for understanding treatment use and refining clinical services will be discussed. Clinicians rely on data from published controlled treatment studies combined with their clinical experience in selecting and sequencing treatments. Most members and veterans receive services in contexts where treatment length is more likely determined by the mutual choices of clients and clinicians than the treatment protocols used. Systematic inquiry of these clinically complex (i.e., less controlled) situations provides complementary information in predicting service needs.

89. Chiropractic Care Integration Into the Veterans Health Administration in the United States of America: Review of a Successful Model

Passmore, S.R. and Lisi, A.J.

University of Manitoba and Veterans Health Administration, Office of Rehabilitation Services

Introduction/Objective: For American veterans who were honourably discharged from active military duty, there is a system of 163 Medical Centers (Hospitals), and 859 Ambulatory Care/Community Based Outpatient Clinics (CBOCs) that provide them with clinical care throughout their lives (Ashton et al., 2003). The Veterans Health Administration is the largest network of healthcare facilities in the United States, employs more than 15,000 physicians, and has an operational size similar to the province of Ontario (Anderson, 2005). Services at Veterans Health Administration facilities include the spectrum of specialties from medicine, surgery, pharmacy, physical therapy, dentistry, optometry, podiatry, and most recently chiropractic care.

Methods: This paper is a narrative review of the successful integration of chiropractic care into the Veterans Health Administration in the United States of America.

Results: Today there are chiropractic clinics at 45 Veterans Health Administration facilities, staffed by 38 full time and 15 part-time chiropractors that are federal employees of the Veterans Health Administration. Initial reports have shown Veterans Health Administration chiropractic care to demonstrate both statistically and clinically significant improvement for musculoskeletal complaints in veterans. (Dunn et al., 2011, Lisi 2010, Dunn 2009).

Conclusion: Chiropractic care is considered a safe, effective and cost effective non-pharmacological/non-surgical intervention for a myriad of acute and chronic musculoskeletal complaints, particularly low back pain, with

good levels of patient satisfaction (Dagenais & Haldeman, 2002). Musculoskeletal injury, specifically low back pain is a primary complaint in 46.4% of contemporary veterans returning from Operation Iraqi Freedom and Operation Enduring Freedom (Gironde et al., 2004). In 1999 the Veterans Health Administration began providing chiropractic care via off-site private chiropractors, and in 2004 it implemented on-site chiropractic clinics at select healthcare facilities.

90. Component Position and Metal Ion Levels in Computer-navigated Hip Resurfacing Arthroplasty

Rudan, J, Mann, S., Kunz, M., Hope, J. and Grant, H.

Queen's University and Kingston General Hospital

Introduction: Metal on metal implants have been shown to cause soft tissue damage to muscle, capsule and connective tissues. Poorly functioning implants often cause wear debris. Wear debris particles deposited in regions around the joint cause tissue necrosis and may cause pseudo-tumors which leads to hip mobility issues when leaked into the blood. The objective was to evaluate the influence of prosthetic positioning on metal wear. Our hypothesis was that increased acetabular inclination would be associated with increased cobalt and chromium levels.

Methods: In this retrospective case series review, 143 metal-on-metal hip resurfacing implants were placed in 130 patients between 2005 and 2010 using a CT-based navigation system. Femoral component position was analysed using recorded values from intra-operative navigation for anteversion and valgus alignment, and acetabular inclination was measured from post-operative plain films. Cobalt and chromium metal ions were measured in serum levels. Two separate multiple regression analyses were performed, using chromium and cobalt metal levels as dependent variables. Our independent variables included age, component head size, femoral version angle, pre and post-operative inclination angle and single or bilateral resurfacings.

Results: Twenty three of our patients were women, 108 were men and their average age was 50 (7.9)SD. The average component head size was 52, the average pre-operative acetabular inclination angle was 56.2 and 43.4 post-operative. Cobalt and chromium levels averaged 5.8 and 5.9 ppb respectively. There were significantly more females in the higher chromium group. Regression analyses found smaller component head size was a weak predictor of increasing chromium levels (R square=.04), while adjusting for the other variables in the model.

Conclusion: Our hypothesis that increased post-operative acetabular inclination would be associated with increased cobalt and chromium ion levels was not found. This could be a result of data based on 2D images rather than 3D analyses. Unlike a similar and recently published study (Hart 2011), we found that head size was a significant but weak predictor of chromium levels. Future work will include 3D analyses of this cohort.

91. Strength Through Adversity: Promoting Post-Traumatic Growth Strategies

Warner, R.E.

University of Toronto

Brief Description: The goals of this submission are to increase awareness of Post-Traumatic Growth (PTG), and to illustrate Solution-Focused Brief Therapy (SFBT) intervention questions that are helpful to all helping professionals and can be taught to peers and family members. How to apply these questions, when individuals express symptoms of re-experiencing, avoidance, and hyper arousal, will be illustrated.

Support for this approach is the US Army's Comprehensive Soldier Fitness program and its Positive Psychology foundation. A central part of the CSF is a PTG course that is mandated for all soldiers. (SFBT is an application of Positive Psychology.)

Clinical Outcomes: Most recent references: Solution-Focused Brief Therapy; A Handbook of Evidence-Based Practice (2012). Franklin. Treppe, Gingerich, McCollum. editors (2012). Oxford University Press. The Post-traumatic Growth Inventory: Measuring the Positive Legacy of Trauma. Tedeschi & Calhoun. (1996). Journal of Traumatic Stress, 9, 455-471. Trauma, Recover, and Growth; Positive Psychological Perspectives on Post-traumatic Growth. Joseph, S., Linley, A. (2008). John Wiley. Comprehensive Soldier Fitness and the Future of Psychology: American Psychologist (2011), Vol. 66, No 1.

Patient Population: At CFB Kingston (mental health unit) for almost 3 years I used SFBT approach with OSI clients including starting the first PTG

group treatment. Currently, I am treating soldiers, veterans, and families at the Integrated Personnel Support Centre.

92. A Case Study in Constructive Dissociation

Williams-Keeler, L.

Associates For the Treatment of Traumatic Effects and Responses (AFTER)

Brief Description: This presentation posits that it is possible for peritraumatic dissociation to be protective for PTSD. The case-in-point is a CF Master Seaman who was in a CC-130 Hercules transport that crashed on its final approach to CFS Alert, twenty years ago. Because he had a history of using dissociation to disconnect from childhood pain, he spontaneously deployed that coping skill while he and the others who survived the crash awaited rescue many hours later because of a weather front moving into the area. This disconnection from reality, or "constructive" dissociation, prevented the consolidation of traumatic memories during the 47-hour-long ordeal. Even with the amputations that followed his rescue, he remained symptom-free, in terms of PTSD. He did, however, suffer from dissociative amnesia and he did disconnect so much from the deadly reality that he was confronting that he remembered telling jokes and giving away his mitts to others whom he felt were in more dire threat of death from hypothermia.

Clinical Outcomes: The assessment scales that were used to assess his symptoms in retrospect included the PTSD symptom Check List for Military (PCL-M), the Clinician Administered Scale for the Diagnosis of PTSD (CAPS-DX), the Dissociative Experiences Scale (DES) and the Peri-Traumatic Dissociation Scale (PDS).

Patient Population: This is a case study of one Canadian veteran but the results are important for the assessment of traumatic and dissociative responses for all military and civilian populations who have the potential to face life-threatening events.

8. Poster Presentations

93. Development of Objective Indicators of Sincerity of Effort During Clinical Assessment of Trunk Function

Almosnino, S., Bardana, D.D., McGillivray, T., Bruce, O. and Stevenson, J.M.

Queen's University

Introduction/Objective: Clinical assessments involving repetitive trunk motion exertions are regularly performed for determinations related to impairment and disability ratings. However, the validity of test results are reliant on the participant performing to the best of his/her ability during trial performance. Previous research has suggested that during performance of sincere trunk movement efforts, variations between successive trials are small. Conversely, during an attempt to feign the presence of pain or injury; set internal consistency is compromised. In this study, we explore the use of a waveform similarity measure, namely the Variance Ratio (VR), to discriminate between sincere and feigned effort attempts.

Methods: 77 healthy individuals (age range 18-57 years) performed 4 sets of 6 continuous trunk flexion/extension repetitions. For the first 2 sets, participants were instructed to perform movements at a self-selected pace through their full individual range of motion. For the last 2 sets, participants were asked to feign back injury or pain. Three-dimensional trunk-pelvis joint angular velocity data were segmented into individual repetitions, and the VR was calculated to quantify individual intra-set consistency. A cut-off score between effort types was established by calculation of a one-sided tolerance interval at a level of 99% of sincere efforts with a probability of 99%.

Results: Sincere efforts were characterized by a lower VR and relatively narrow score variation across participants. Feigned efforts were, on average, less consistent with large intra-participant variability. Utilizing a VR cut-off score corresponding to 100% specificity within the sample, 7 feigned efforts were misclassified as being maximal (90.9% sensitivity). Utilizing the more generalizable cut-off score, the VR misclassified 13 of the 77 feigned efforts as being sincere, for a corresponding test sensitivity of 83%. In no case, however, was a sincere effort being misclassified as feigned (100% specificity).

Conclusion: The sensitivity and specificity values obtained are comparable to those reported previously in participant samples similar to ours. However, the current protocol utilizes measurement equipment that is less specialized, as well as relies on only a single parameter to differentiate between effort types. This, in our opinion, is favorable for rapid transfer of knowledge and methods to the clinical realm. Future research will assess the ability of other time-series data analysis techniques to improve upon test sensitivity values, as well as expand to evaluation of symptomatic participants.

94. Yoga as an Adjunct to Empirically Supported Treatment for Operational Stress Injuries

Bertrim, S., Robertson, C., Hammond, N., Bailliu, A. and Hale, S.

Royal Ottawa Mental Health Centre

Brief Description: The Royal Ottawa Operational Stress Injury (OSI) Clinic is funded by Veterans Affairs Canada (VAC) as a part of a National Network of OSI Clinics and in partnership with The Royal Ottawa Mental Health Centre. The Royal Ottawa OSI Clinic provides specialized mental health care to individuals with service-related OSIs, including veterans, CF Members, RCMP Members and their families. Our clinical program involves comprehensive assessment, individual and group treatment, couples intervention, and counseling. Empirically supported treatments are individualized to meet the unique needs of each client and family. Yoga classes have also been offered, consistent with the clinic's holistic approach.

Clinical Outcomes: Given the lack of research in this area, data are currently being collected. This presentation will briefly review the existing literature on yoga as an adjunct to treatment for mental health and wellness, with a focus on operational stress. Preliminary data from 5 yoga classes (N=27) will be presented. Due to incomplete data, trends on measures of mental health (post-traumatic stress, depression, anxiety) and physical health (fatigue, pain) will be presented, as well as qualitative feedback from clients and observations from treating clinicians. Future directions for integrating yoga and other adjuncts to treatment will be discussed.

Patient Population: In recent years, yoga has been popularized in the media and research has begun to examine potential physical and mental health benefits. Considering the unique characteristics of OSIs in the military and veteran population, yoga may present a palatable way to engage clients with the OSI Clinic, reduce tension, enhance mental and physical health, and promote resiliency and wellness. Yoga practice also embodies many of the clinic's treatment philosophies. This presentation will review the characteristics of our client population, the range of services in which clients of the Clinic participate, and the rationale for introducing yoga as an adjunct to treatment. Conceptualization of the usefulness of yoga as an adjunct at different phases of treatment will be discussed (i.e., facilitate stabilization, promote self-care during active treatment, enhance resiliency and wellness following active treatment).

95. Virtual Reality Exposure Therapy vs. Treatment as Usual for Combat-Related Post-traumatic Stress Disorder

Boivin, M., Davies, D., Robertson, C. and Shlik, J.

Royal Ottawa Mental Health Centre

Introduction/Objective: This grant-funded investigation (currently recruiting) will compare Virtual Reality Exposure Therapy (VRE) to Prolonged Imaginal Exposure (IE; treatment as usual) for combat veterans with Post-traumatic Stress Disorder (PTSD). Despite its effectiveness, a significant minority of individuals receiving IE experience only partial benefit (Grunert et al, 2003); IE may be limited by the ability to vividly recall aspects of trauma memories that would result in therapeutic benefit (North, North & Coble, 2002). VRE may enhance vividness through immersion into simulated environments, and may represent a more palatable modality relative to traditional therapy.

Methods: Participants will be randomly assigned to receive 12 sessions of VRE or IE. The IE arm will follow the 12-session protocol outlined in Rothbaum, Foa, and Hembree (2007). The VRE arm will be identical, with the exception that the imaginal exposure component will be done exclusively within the Virtually Better Afghanistan environment. Participants will be asked to recount the index trauma narrative while in the virtual environment. PTSD symptom severity, exposure vividness/immersion, and other variables (attendance, dropout, treatment palatability) will be assessed at pre and posttreatment and 3 and 6 month follow-ups.

Results: Dimensional measures (e.g., PCL-M, BDI-II, BAT) will be submitted to Multiple Analyses of Variance, on both intent to treat and completer samples. Where missing data exist, methods using least squares regression slopes estimated for each participant will be used. Regressions will be used to assess whether presence mediates the relationship between pretreatment anxiety (PCL-M) and within session SUDS, as well as between pre and posttreatment PCL-M scores. Categorical analyses (e.g., percent meeting diagnostic criteria for PTSD, response rate, dropout rate,) will be conducted using x2 or Fisher exact tests.

Conclusion: This study is among the first to investigate whether a novel treatment modality (VRE) enhances treatment as usual for combat veterans

with PTSD. If it is demonstrated that VRE leads to comparable decreases in PTSD symptom severity, or enhances immersion during exposure, it represents an important tool for optimizing outcomes in partial responders. Further, if VRE is shown to be more palatable than traditional therapy, it may reduce barriers to seeking therapy and improve engagement in effective treatments in this underserved population. Results also carry implications for facilitating the reintegration of Canadian forces personnel on return from deployment.

96. Incidence and Risk Factors for Bubble Formation in Canadian Forces Scuba Divers

Brett, K., Zeindler, P. and VanDenKerkhof, E.G.

Introduction/Objective: While Decompression Sickness (DCS) is a relatively rare condition amongst the general population, it is an important health consideration among CF divers who often experience higher rates of decompression stressors during repetitive Force Protection Dives. The aim of this study is to investigate the incidence and potential risk factors for bubble formation, and to determine the extent and nature of pre-dive behaviors in CF experimental divers within the Canadian Forces Environmental Medicine Establishment (CFEME), DRDC Toronto

Methods: Retrospective chart review of 1194 CF experimental CUMA Heliox diver Doppler Score sheets completed between 1998-2005 within the CFEME, DRDC Toronto. Doppler Score Sheets consist of the pre-dive questionnaire, medical assessment, as well as post-dive bubble grade (BG) monitoring. Data included: max bubble grade precordial site, max bubble grade any site, exercise, medications, alcohol, infectious symptoms and smoking status within 48 hours of the dive, as well as food and fluid intake prior to the dive, level of fatigue and age. 102 dives were excluded as repeat dives with SI less than 6 hours, repeat dives with SI > 6 hours were included. Non-parametric categorical statistics used to measure effect of independent variables on bubble grade.

Results: Preliminary data analysis:

1092 dives included, 1 DCS event. Max precordial BG 87.4% ≤2, 12.6% ≥3. Max BG all sites, 73.9% ≤2, 26.1% ≥3. Within 48 hours of diving 45% exercised, 16.7% used oral medications, 38.25 consumed alcohol, 15.4% smoked and 9.7% experienced infectious symptoms. Prior to the dive 88.1% consumed food, 91.8% consumed liquids, 26.3% felt fatigued.

No significant differences were observed in bubble grade among divers based on age, exercise, medications, alcohol, smoking, infectious symptoms, food, fluid or fatigue level ($P > 0.05$) when analyzing all dives; as well as analysis of high stress, moderate stress, and low stress dives, exercise and no exercise during the dive separately.

Conclusion: No evidence of differences in bubble grade formation based on currently identified risk factors of exercise, medications, alcohol, smoking, infection, food, fluid, or fatigue status. However, reliability of self-reported questionnaires is known to be limited. In addition, risk factors recorded as binary positive or negative without quantification or qualification. Future studies are required to address these limitations.

97. Six Years Later, is the New Veterans Charter Six Feet Under? How Successful Has Canada Been Transitioning and Rehabilitating its Canadian Forces Personnel?

Brueya, S.

St Paul University

Introduction/Objective: The implementation of the New Veterans Charter (NVC) in 2006 represents the most significant change in how Canada provides benefits to serving and transitioning CF since WWII, and arguably since WWI. How effective has the NVC been? Are the public criticisms substantiated by facts and outcomes? Will the NVC withstand both the test of time and the rapidly increasing numbers of CF accessing the programs?

Methods: Independent research into the outcomes NVC programs is limited. The majority of statistics are provided by Veterans Affairs Canada (VAC). Departmental audit and research reports, media relations responses and Access to Information requests provide much information. Legal actions, academic research, VAC Ombudsman reports, Statistics Canada studies and media reports provide both complementary and enhanced perspectives on the functioning and state of the NVC. The mechanisms for change and improvement are also studied as indicators of program adaptability and functionality.

Results: Important NVC programs are only partially accessed or administered parsimoniously, resulting in mixed outcomes and less than expected benefits. University education as part of the NVC was non-existent until only recently and then only sparsely supported. Payouts from the lump

sum program have met forecast spending notwithstanding the higher than anticipated injured accessing the program.

Conclusion: The NVC has had mixed successes. Official statistics and reports substantiate numerous public criticisms. The population accessing the NVC programs have outcomes which are troublingly lower than all other primary VAC population groups. Administrative barriers to programs are substantial and responses to improve are lethargic. Mechanisms for change exclude any real participation from the population most affected: the serving injured, released CF members and their families. A significant lawsuit has been launched disputing the legal foundations of the NVC. The future viability of the NVC and its mechanisms for change are in question.

98. Does a Dementia Unit Reduce Polypharmacy in a Veteran's Pavilion?

Butler, R. and Law, R.

Memorial University

Introduction/Objective: To determine the effect an institutional environmental change has on the medication usage in a Veterans pavilion. Secondary measures studied include: nursing satisfaction as a result of this change, any measurable benefits to cognition in the dementia residents pre vs post change as measured by MMSE testing, effect if any on mortality.

Methods: The number and doses of medications (regular and AS needed, the types of medications used (antipsychotics, anxiolytics, sedatives, bowel meds etc.) Time points May/June 2009, 6 months post move, one year post move and the final time point at 18 months post move (Nov/Dec 2010).

Results: Preliminary results seem to show an overall decrease in mortality with significant reduction in medication usage. Cognitive decline and nursing satisfaction seem unaffected.

Conclusion: Data analysis not yet complete but will be finished by end of July 2012.

99. Co-morbid TBI and Operational Stress Injuries: The Role of the Mental Health Clinician in a Multidisciplinary Deployed Setting

French, S.

Canadian Forces Health Services

Introduction/Objective: Mild traumatic brain injuries (mTBI) and operational stress injuries (OSI) can overlap causing confusion when establishing a diagnosis and a treatment plan, especially while on deployment. The imperative for an effective clinical approach in the deployed setting for co-morbid mTBI and OSI is being driven by the post-deployment statistic that greater than one third of US veterans who have suffered an mTBI also suffer from PTSD. This study reviewed existing research to establish the multidisciplinary role of the mental health clinician in a deployed setting to improve long-term outcomes and optimize resource allocation.

Methods: Studies and clinical guidelines regarding mTBI and OSI, both separately and co-occurring, were reviewed and synthesised with established best practice in the management of complex health care and combat stress reaction, with the aim of establishing the effective integrated role of the mental health clinician.

Results: There is insufficient research available at present to establish clear clinical practice guidelines for co-morbid mTBI and OSI. However, the multidisciplinary approach involving a mental health clinician can help unravel the clinical picture for a more effective patient outcome. Six practical roles for the mental health clinician were identified along the continuum of care for mTBI patients. One: Assist the most responsible physician in forming the diagnosis. Two: Provide input into the care plan including a disposition recommendation (evacuate to Role 4 or RTD (return to duty)). Three: Provide an ongoing assessment for delayed or changing OSI. Four: Provide supportive therapy for both OSI and mTBI utilizing the PIES model (Proximity, Immediacy, Expectancy, and Simplicity). Five: Provide early Cognitive Behavioural Therapy when clinically indicated. Six: Provide input into discharge readiness (potentially with cognitive testing) and plan for RTD with follow-up care.

Conclusion: The inclusion of a mental health clinician within a comprehensive, multidisciplinary, patient focussed model of deployed care can improve both short and long-term patient outcomes for co-morbid mTBI and OSI, and reduce long-term treatment requirements.

100. Differentiation of Physiological Measures of NVG-Induced Neck Myalgia by Principal Component Analysis

Harrison, M.F.

University of Regina

Introduction/Objective: Principal component analysis (PCA) is a powerful

statistical tool capable of multivariate data reduction, used here to analyze electromyography (EMG) root mean square (RMS) reconstructed waveform results from military aircrew with and without reported neck pain. We hypothesized PCA would identify significant modes of variability between groups.

Methods: Twenty-nine aircrew (25M, 4F) participated in an isometric testing protocol, including maximal voluntary contraction (MVC) and a submaximal ramping protocol of cervical extension. Bilateral EMG monitoring of the upper trapezius, sternocleidomastoid and splenius capitis occurred and the resultant EMG waveforms were analyzed with PCA. Principal component (PC) scores were analyzed using a one-way ANOVA.

Results: PC scores were significantly different between groups for the left ($p=0.021$) and right ($p=0.016$) splenius capitis only. Reconstructed curves of RMS results corresponding to force production indicated symptomatic subjects displayed lower RMS values as compared to subjects without neck pain, suggesting a possible mechanism of injury.

Conclusion: The application of PCA to the results of a submaximal isometric ramping protocol made it possible to differentiate between neck pain symptomatic and asymptomatic individuals using a physiological parameter. Further physiological investigations of neck pain should be aware of this technique where more conventional statistical methods do not detect differences.

101. Creating an Online Acceptance-Based Behavioural Therapy for Chronic Pain in a Military Population

Holens, P.L., Simister, H., Klassen, K. and Gilberto, A.

University of Manitoba

Brief Description: This presentation describes the creation process, difficulties encountered, and early results of an online chronic pain management program for individuals with a military or RCMP background.

Clinical Outcomes: Primary measures evaluate sensory and affective pain ratings, acceptance of pain, pain-related catastrophizing, fear of movement and re-injury, and sleep quality. Secondary measures evaluate severity of depression, anxiety, and PTSD symptoms as well as client satisfaction with the program.

Patient Population: Active military, RCMP, and veterans who have experienced chronic pain for six months or longer.

102. Interfacing Research and Policy Through Knowledge Exchange: The Income Study and the Survey on Transition to Civilian Life.

Kruger, D. and Thompson, J.M.

Queen's University and Veterans Affairs Canada

Introduction/Objective: Knowledge exchange is the two-way process of applying research findings to policy and program development. An important aspect of knowledge exchange is establishing planned steps to ensure policy is informed by research. The objective of this study is to describe the knowledge exchange practices, barriers, facilitators, and culture at Veterans Affairs Canada (VAC). This is a preliminary descriptive step in the facilitation of planning for effective research knowledge management in government.

Methods: (1) Scoping literature review of pertinent academic literature on knowledge translation, knowledge exchange, and the intersection of research and policy; (2) Interviews and focus group held with researchers and knowledge users employed at VAC; and (3) Qualitative analysis to (a) identify knowledge exchange practices, facilitators and barriers at VAC with regard to The Income Study and the Survey on Transition to Civilian Life, the first two studies in the Life After Service Studies series, and (b) describe the knowledge exchange culture at VAC.

Results: VAC Research Directorate staff considered knowledge exchange in planning for the LASS studies. This presentation will explore current knowledge exchange practices, barriers, facilitators and culture with particular emphasis on contextualization and dissemination of research knowledge for development of policies, programs, and services to meet the needs of Veterans.

Conclusion: This study described a recent knowledge exchange experience at VAC with respect to two key Veteran population research studies. This information will be useful in optimizing knowledge exchange to better understand and meet the needs of Veteran populations in government settings.

103. Validation of the Human Body Model Against Surface Electromyography of the Lower Limb in Dynamic Movements

Mills, R., Barton, G., Lajoie, Y. and Sveistrup, H.

University of Ottawa

Introduction/Objective: The Human Body Model (HBM) (Motek Medical, The Netherlands) uses an avatar to provide real-time visual biofeedback of muscle activity, calculated through inverse dynamics and optimization techniques. We provide external validation of HBM, comparing estimated muscle forces with simultaneously recorded surface electromyography (sEMG).

Methods: Five adult male subjects were tested in Liverpool, two (1M, 1F) in Ottawa. Bipolar sEMG electrodes recorded activity of six muscles of the left lower limb (rectus femoris, vastus medialis, medial gastrocnemius, semimembranosus and semitendinosus, biceps femoris and tibialis anterior) at 1000 Hz. Positional data of 47 retro-reflective markers placed over body landmarks were recorded with 12 Vicon MX cameras (120 Hz). Subject movements (calf raises and knee bends) were recorded while standing on two Kistler force platforms (1000 Hz). Kinematic and kinetic data were used to reconstruct the HBM avatar. sEMG signals were filtered and correlations calculated with their respective HBM muscle force estimations.

Results: Preliminary analyses indicate moderate correlations – magnitudes of the correlations were muscle and task specific.

Conclusion: Though initial correlations were low to moderate, the HBM software has been developed since initial protocol in Liverpool. Additional protocol modifications include optimized camera settings, signal conditioning, and cross-correlation analysis for the Ottawa data set.

104. Functional and Biomechanical Assessment of an Angular Velocity Approach For Stance Control Orthoses in a Virtual Reality Environment

Montgomery, W., Lemaire, E. and Bridgewater, C.

University of Ottawa

Introduction/Objective: The Computer Assisted Rehabilitation Environment (CAREN) is useful in rehabilitation related to posture, balance and post-traumatic gait training and research. This technology offers a safe, repeatable means of applying perturbations that cannot be achieved in a real world setting, and is an ideal environment for the development of a method used to induce a knee collapse stumble. CAREN may mimic stumble situations more realistically than previously possible in laboratory settings. The CAREN consists of a 180° projection screen, a dual-track treadmill embedded in a motion platform, an overhead fall arrest harness, and a motion capture system.

Methods: Preliminary perturbation methods included sudden downward or forward platform translations, platform incline or decline, and treadmill stop and start. Another perturbation method that sped up one treadmill belt while slowing down the other was tested in self-paced mode. This “split speed” treadmill method successfully produced a knee collapse. To finalize this method, five able bodied participants walked at their own pace in the CAREN environment while the operator applied the “split speed” perturbation at different intensities. Kinematic data was recorded at 120Hz.

Results: Preliminary test methods produced mild perturbations to stance but did not induce a knee collapse. Stumble responses included small recovery steps and widening of the base of support. Results will be presented on the stumble responses produced by these preliminary methods. System response limitations in speed and acceleration that may have influenced the effectiveness of these methods will be presented, along with the system settings used to create the “split-speed” perturbation. Kinematic data relating to stumble recovery strategies observed during testing of the split speed perturbation will be presented.

Conclusion: Initial investigations have indicated that, during self-paced walking in a variable platform slope scenario, proportional slowing of the track on one side after foot strike and speeding up of the track on the opposite side resulted in a knee collapse stumble. Conclusions derived from the upcoming testing finalizing the methods will also be presented. Conclusions derived from this development process may be useful in the future projects incorporating a stumble response.

105. Les défis du travail de l'ergothérapeute dans les Forces Canadiennes

Nadeau, C.

Forces Canadiennes

Brief Description: L'objectif de cette présentation consistera à faire connaître le milieu de pratique de l'ergothérapie à travers les Forces armées canadiennes, à démontrer comment les services d'ergothérapie ont innové, tout en faisant la lumière sur les défis rencontrés lors son implantation dans le monde militaire. Depuis les dernières années, plusieurs initiatives

ont été prises afin de développer des procédures de soins standardisées en ergothérapie et ce, pour l'ensemble de la population militaire au Canada.

Clinical Outcomes: EPIC evaluations Oswestry Index incapacité du cou DASH Purdue pegboard Box and blocks, Minnesota McGill-Melzack questionnaire.

Patient Population : Militaires actifs dans les Forces armées, qui présentent des blessures physiques sévères provenant de missions opérationnelles et/ou autres blessures majeures (MVA, accident de travail etc)

106. La réadaptation physique adaptée à la clientèle complexe à Valcartier: un beau défi!

Nadeau, C. & Bernard, S.

Forces Canadiennes

Brief Description: Depuis quelques années, les Forces armées Canadiennes font face à de nouveaux défis en lien avec le nombre de blessés militaires et la nature complexe des lésions. Comment optimiser le suivi de cette clientèle? L'état des connaissances actuelles démontre clairement que l'interdisciplinarité s'avère une approche efficace centrée sur le patient qui facilite l'échange, l'établissement d'objectifs communs et assure un meilleur continuum de soins. Comment avons-nous vécu cette réalité? Quelles leçons apprises en retirer?

Clinical Outcomes: CF Express - CHAMP - Échelle fonctionnelle du membre inférieur - Spinal et Hand function sort - retour au travail (avec ou sans restrictions)

Patient Population: Militaires avec blessures de nature complexe

107. Utilisation of the CAREN System at the Glenrose Hospital for Stroke and Traumatic Brain Injury Rehabilitation: Goals Pursued, Task Used and Variability amongst Physiotherapists

Parent, E., Hébert, J., Buttar, V. and Richter, A.

University of Alberta, Glenrose Rehabilitation Hospital, Alberta Health Services

Introduction/Objective: The Computer Assisted Rehabilitation Environment (CAREN) system combines use of virtual reality and robotic platform to create a safe, immersive and flexible environment for pursuing rehabilitation goals. In Edmonton, the system has been introduced in the treatment of civilians, members of the Canadian Forces, and Veterans since September 2011 and utilization data has been documented since January 2012. The goal of this study is to report the variability in the CAREN activities used by physiotherapist in the pursuit of the 3 most prevalent objectives for each of the most prevalent conditions amongst patients using the system.

Methods: Standardized session tracking sheets were completed prospectively by all physiotherapists supervising CAREN rehabilitation sessions between January and May 2012. Objectives pursued, task used and therapist involved were retrieved for the two most prevalent diagnostic groups. Chi-square tests were used to compare frequencies between diagnostic groups for the objective pursued and task used. Cross-tabulations were used to examine the task the most frequently used by therapists in the pursuit of the 3 most prevalent objectives for the most prevalent diagnostic categories.

Results: Stroke (n=24) and traumatic brain injuries (TBI=10) were most prevalent. Aims were: improving balance (83% stroke, 90% TBI), weight shifting (WS 79%, 60%), stepping (50%, 30%), endurance (42%, 50%), reaching and velocity (17%, 40%). The road (92%, 80%), targets (95%, 90%), boat (67%, 90%) and maze (21%, 50%) were the most used tasks. Differences between groups were not significant. For stroke, for balance, all therapists used the boat, and all but one used the road and targets. For WS and endurance, all used the road, and targets. For WS, 10/14 therapists and, for endurance, all but one used the boat. All 9 therapists pursuing stepping used targets.

Conclusion: This utilisation review highlighted a good homogeneity in the choice of task to address the most commonly pursued goals of balance, weight shift, endurance and stepping in prevalent diagnostic groups. This data will support a discussion among therapists in preparation to formalize care protocols. This analysis identified populations and impairments to target that offer the best opportunity for clinical research and helps prepare the assessment of the effect of CAREN care pathways.

108. A Model of Low-Level Primary Blast Exposure in Rodents Results in Neurobehavioural Deficits and Impaired White Matter Function

Park, E., Eisen, R., Kinio, A. and Baker, A.J.

Li Ka Shing Knowledge Institute at St. Michael's Hospital

Introduction/Objective: There is strong evidence that primary blast can cause neuropathological alterations in the brain. However, the effect of a

subclinical blast (blast with no obvious sign of external trauma or lung injury) as a contributing factor to the neurological symptoms is less clear. Here we demonstrate the susceptibility of unmyelinated white matter fibres and proteins following subclinical blast. We also demonstrate that white matter dysfunction is associated with neurobehavioural deficits related to anxiety and stress-related behaviours.

Methods: Anesthetized male Sprague-Dawley rats (~300 g) were subjected to a subclinical primary blast (approx. 28 kPa), below the threshold required to induce pulmonary trauma. Rat behaviour was evaluated on the rotarod, the light/dark box and open field anxiety test. We used Western blotting to examine expression and degradation of axonally expressed cytoskeletal proteins, alphaII-spectrin and NF200 in the corpus callosum. Acute slice preparations were used for electrophysiological analysis of evoked compound action potentials (CAPs) in the corpus callosum.

Results: Calpain-mediated alphaII-spectrin degradation (150 kDa fragment) was detected in the corpus callosum at 48 hours post-injury paralleled by increased heavy neurofilament expression. Blast exposed rats had significantly lower rotarod latency times relative to sham rats ($p = 0.008$). Increased anxiety and stress-related behaviour was observed in blast rats ($p = 0.016$) in the open-field test. Blast rats also had fewer transitions and time spent in lit sections of the light/dark box. Electrophysiological recordings from the corpus callosum indicated greater CAP deficits in unmyelinated fibres of the corpus callosum relative to myelinated fibres at 14 days post-injury.

Conclusion: Collectively, our results indicate that subclinical blast exposure can result in persistent neurological changes in cerebral white matter in parallel with neurobehavioural deficits.

109. Collecting Hair and Fingernail Biomarkers For Chronic Stress – a Pilot Study

Peng, H.T., Buick, F., Pickering, D. and Goodman, L.

Defence Research and Development Canada

Introduction/Objective: Operations, even preparing for them, can present a broad spectrum of stressors to military personnel. The resultant stress, although not always leading to negative consequences, can impair one's well-being and operational performance. Self-report methods are traditionally used for quantifying stress, but objective measures should accompany to control subjective bias. Biomarkers were available for acute stress, but not for chronic stress until recent studies explored the hormone cortisol accumulating in hair as a potential indicator. Therefore, a pilot study was conducted to investigate practical aspects of using cortisol and dehydroepiandrosterone (DHEA) from hair and fingernail samples for measuring long-term stress.

Methods: Following a call for participants from the general population, a total of 444 hair and fingernail samples were collected from 144 healthy men and women (18 – 60 age range), at two sampling points separated by one month. Concurrent self-reports consisted of 3 measures of stress and 2 measures of health outcomes. Demographic variables and characteristics of hair were also collected to assess potential confounders in associating the biological, psychosocial, and health measures. Cortisol and DHEA levels in each biological sample were analyzed using commercially available enzyme immunoassay kits.

Results: With some exceptions, cortisol and DHEA concentrations were generally consistent with the limited published data available. Preparing for this data gathering, and the biochemical analyses themselves, were the most labour-intensive aspects of the study, but the actual data collection was straightforward when performed by trained persons. The extent of the relationships between indicators of stress, both biological (i.e., hair and fingernail levels of cortisol and DHEA) and self-reported (i.e., hassles, life events, perceptions of stress), and health (i.e., minor physical ailments, psychological symptoms) were determined. Non-stress variables such as gender, age, hair characteristics, and frequency of hair wash, were included in the data analysis.

Conclusion: The procedures used are readily adaptable to a military environment. Further study to investigate and quantify stress is warranted in military populations on the road to readiness and/or experiencing different types of operations.

110. Inflammatory Profiles of Canadian Forces Personnel Returning from Afghanistan Warzone Deployment: Potential Implications to Post-traumatic Stress Symptoms

Rhind, S.G., DiBattista, A., Boscarino, C., Shiu, M.Y., Fikretoglu, D., Lanius, R.A., Richardson, D.J., Peng, H.T., Baker, A.J., McLellan, T.M. and Jetly, R.

Defence Research & Development Canada, University of Toronto, Western University, Parkwood Operational Stress Injury Clinic, St. Michael's Hospital,

Canadian Forces Health Services

Introduction/Objectives: Combat exposure is associated with physical and mental health problems. Recent deployments to Afghanistan have contributed to significant numbers of returning Canadian troops developing post-traumatic stress disorder (PTSD) and other psychiatric conditions. Research supports multiple pathways linking psychological stress and affective disorders to activation of the immune system and dysregulation of inflammatory mediators in particular. Current findings are inconsistent, with few prospective studies examining the impact of warzone exposure on inflammatory biomarker profiles and psychological variables. The aim of this study was to investigate an array of cytokines/chemokines in association with development of PTSD symptomatology in soldiers after a tour in Afghanistan.

Methods: Plasma was collected from regular force troops post-deployment (N=25; ROTO 1-11) and non-deployed, age-matched reservists (N=10; Queen's York Rangers). The post-deployment group was stratified according to those assessed within 5 months (N=10) vs. those evaluated 5–12 months (N=15) after returning. Ultra-sensitive electrochemiluminescence-based MULTI-ARRAY technology was utilized to examine cytokines [interleukin (IL)-1 β , IL-2, IL-5, IL-6, IL-10, IL-12, interferon (IFN)- γ , tumor necrosis factor (TNF)- γ] and chemokines [IL-8, Interferon-inducible protein (IP)-10, monocyte chemoattractant protein (MCP)-1, Eotaxin, Eotaxin-3, macrophage-derived chemokine (MDC), macrophage inflammatory protein (MIP)-1 β , thymus-activation-regulated chemokine (TARC), chemokine C-C motif ligand (CCL)-17]. Plates were read on a SECTOR Imager and optical-density values converted into protein concentrations.

Results: Pooled data for the post-deployment group showed significantly (ANOVA; $P < .05$) elevated circulating values for 4 (IL-8, Eotaxin, Eotaxin-3, IP-10) of 17 different cytokines/chemokines assayed, compared to non-deployed controls. Contrast of those troops sampled within 5 vs. 5–12 months revealed a differential pattern of expression; levels of TNF- α , Eotaxin and IP-10 were significantly higher in the early post-deployment period, whereas IL-8, IL-10, and Eotaxin-3 levels increased in later samples. TARC displayed a trend toward lower values in both post-deployment groups.

Conclusion: This study used high-throughput multiplex analysis to characterize the peripheral blood inflammatory profiles of soldiers who recently returned from deployment to a warzone. Our findings demonstrate a distinct expression signature dependent on time following post-deployment. These results are consistent with previous studies linking an excess of inflammatory cytokines and chemokines to PTSD vulnerability in traumatized individuals.

111. A Randomized Trial of Ankle Mobilizations & Exercise on Lateral Ankle Sprains

Robitaille, E., Hébert L.J., Agur, A. and Switzer-McIntyre, S.

Canadian Forces Health Services Group, Medical Policy & Centre for Interdisciplinary Research in Rehabilitation and Social Integration, University of Toronto

Introduction/Objective: Limited ankle dorsiflexion is a common impairment following lateral ankle sprains (LAS) that may cause difficulty with marching or running, as well as increase the risk of recurrence and chronic ankle instability. In CF members, this may result in restricted military training, repatriation, or if persistent, premature release. Common interventions for limited ankle dorsiflexion include active calf stretching and/or passive ankle mobilizations, the latter being appealing due to its reported rapid effectiveness. Ankle mobilizations are manually applied by Physiotherapists to restore passive accessory motions, automatic movements occurring concurrently with active motions according to the adjacent joint surface shapes. However, systematic reviews have critiqued studies including ankle mobilization following LAS for limiting follow-ups to 1 week and outcome measures to ankle mobility tests. It is unknown if improved ankle dorsiflexion persists after one week or correlates with improved function. In a sample of CF members with LAS, this study will investigate the added value of ankle mobilizations: 1) versus sham mobilizations on ankle mobility at 2 weeks and 2) when combined with a comprehensive rehabilitation program when ankle mobility, pain, function, days until a full return to work and recurrences are measured at 2, 8 & 12 weeks.

Methods: Eligible CF members (n=20) reporting to a Physiotherapist within 7 days of an acute, incomplete LAS will follow a standardized comprehensive rehabilitation program while being randomized to either an ankle mobilization or sham group. At baseline and follow ups a blinded Physiotherapist will administer the Bent Knee Dorsi Flexion test. Secondary outcome measures will include the Visual Analogue Scale, the Lower Extremity Functional

Scale, the Foot & Ankle Disability Index, days until full return to work and number of LAS recurrences.

Results: As a work in progress, preliminary results will be presented descriptively and discussed.

Conclusion: This study will address the current limitations of research involving ankle mobilizations post LAS, in addition to determining if adding ankle mobilizations to a comprehensive LAS rehabilitation program synergistically hastens the rehabilitation and operational readiness of CF members.

112. A Pilot Study of Meaning Therapy for Addictions and Co-Occurring Disorders

Thompson, G.

Sunshine Coast Health Center

Introduction/Objective: Meaning therapy was recently introduced into a residential facility for men suffering from addictions and co-occurring disorders, including military, VAC, and RCMP clients. Based on the work of Paul Wong, meaning therapy begins with Frankl's assertion that "alcoholism . . . [is] not understandable unless we recognize the existential vacuum underlying [it]." The vacuum arises when one is not living a personally meaningful life. Integrating biological, narrative, and cognitive-behavioral psychologies, using personal meaning as the organizing construct, meaning therapy aims to help clients pursue personal strivings and overcome barriers to this pursuit.

Methods: This was an exploratory case study to gain a comprehensive understanding of meaning therapy on participants. The main data came from interviews with four participants, with severe co-occurring disorders, which were analyzed using open and axial coding of Straussian grounded theory. Other sources of data were Purpose in Life (PIL) Test and Behavioral, Symptom Identification Scale-32 (BASIS-32), and psychiatric case notes. Several themes emerged from the data, which were compared for goodness-of-fit with the scholarly research and theory underlying Wong's therapy.

Results: Although there were insufficient data to develop a theory of addiction and recovery grounded in the participant data, there were several therapeutic components of meaning therapy that resonated with participants. Analysis revealed that what brought clients into treatment was a desperate desire to make sense of suffering. The most influential component of treatment was the construct of existential responsibility, the idea that each person is the author of his or her life. Frankl's solution to suffering as filling up the existential vacuum also heavily influenced participants.

Conclusion: The results match previous work using meaning-oriented therapies for those suffering from substance issues and from co-occurring disorders, including military populations. These studies indicated that addiction and trauma were rooted in problems of meaning. Studies have also concluded that affect self-regulation skills were less effective than a combination of defensive and approach skills. The full study is scheduled to begin in the Fall 2012.

113. Rates and Characteristics of Traumatic Brain Injury in Civilian Homeless Men

Topolovec-Vranic, J., Ennis, N., Johnson, P., Michalak, A., Masanic, C., Ouchterlony, D., Distin, K., Stergiopoulos, V., Hwang, S., Kontos, P., Colantonio, A. and Cusimano, M.D.

St. Michael's Hospital

Introduction/Objective: It is estimated that hundreds, if not thousands of Canadian military veterans are homeless. In the United States, veterans make up one in four homeless people. Homelessness amongst military veterans can be exacerbated by a traumatic brain injury (TBI) experienced while on field duty. Additionally, many veterans develop alcoholism in the military that may also fuel their downward spiral. Comparatively, homeless individuals with a history of TBI also have a higher prevalence of alcoholism and drug problems. The objective of this pilot study was to obtain preliminary data regarding the incidence of TBI in a homeless population and to evaluate the descriptive relationships between this civilian population and those of homeless military veterans based on previous studies.

Methods: The study employed a mixed-methods design. Participants were recruited from an adult men's shelter in Toronto, Canada and were interviewed using the Brain Injury Screening Questionnaire (BISQ), a screening tool for TBI, and a demographic survey.

Results: We recruited 111 shelter clients (mean age 54.2 \pm 11.5 years) who had been homeless for an average of 63.5 months. Mean time to complete the interview was 52.7 minutes (SD=21.3 minutes). BISQ screens revealed that 45.0% of participants had a moderate to high probability of a TBI. The

majority (80%) of these participants experienced their first injury before the onset of homelessness. Over two thirds of these participants (68%) reported a current or past history of substance abuse. As a result of a drug or alcohol blackout, 23.4% of all of the participants indicated that they had lost consciousness or were dazed or confused. A subset of the participants (n=65) were re-interviewed 3 months post-recruitment into the study: 49 (75%) completed the interview and the proportion of individuals with negative, low, and moderate-to-high probability of TBI did not differ significantly from the initial interviews.

Conclusion: The pilot data strongly support the feasibility of conducting a large-scale multi-centered trial to implement and evaluate educational interventions for the management of TBI in the homeless. Over two thirds of our sample with a moderate to high probability of a TBI also had a lifetime history of substance abuse. To this end, comprehensive screening for TBI, a history of military service, and how they are related to homelessness is required.

114. Treatment of Co-occurring Operational Stress Injury and Substance Abuse

Tsarouk, T.

Sunshine Coast Health Centre

Brief Description: The military tours in Afghanistan precipitates a rise in problems related to substance abuse among the military personnel. (Volkow N, 2009) Approximately 30% of military personnel who have spent time in a war zone experience PTSD and other mental issues such as depression, anxiety, sleep disorders, and violence in relationships (Johnson H, Thompson A, 2008) Other problems, experienced by returning military personnel, include severe occupational, social, family deteriorations and often legal problems due to alcohol abuse. Operational Stress Injury (OSI) included stress injuries not corresponding to PTSD criteria.

Patient Population: The presented study was empirically - observational.

Methods: During 1.5 years clinical team of Sunshine Coast Health Centre (SCHC), private treatment facility, provided treatment to 37 men aged 23-42 years old, military personnel returned from Afghanistan, suffering from OSI/PTSD complicated with alcohol and other drugs dependence. Treatment consisted of educational component, individual and group psychotherapy, Life Story exercise, CBT, stress and anger management, hypnotherapy, physical activity, social activity, medical treatment, pharmacotherapy of severe anxiety, depressive conditions and sleep disturbances and Family Program for relatives with on-site couple counselling. Clients were assessed before and after treatment with self-assessment scale.

Clinical Outcomes: were measured by improvement of mood, sleep, decrease of irritability, vulnerability to stress, anxiety, anger reactions, intrusive thoughts, nightmares, building healthy life style, and learning coping with emotions and cravings skills.

Results: Clinical experience of conducting OSI treatment program among SCHC clients illustrates the different dynamic of OSI/PTSD associated with alcohol or other drug dependence: a) improvement with residual symptoms and instability in 6 (16.2%) clients; b) significant stable improvement in 24 (64.9%); c) significant improvement with post-traumatic growth among 7 (18.9%) clients.

Conclusion: Further researches are needed to identify the best treatment strategies for addressing OSI/PTSD/SUD and other comorbidities as well as follow up researches to observe further dynamic of OSI with addiction and further adjustment of military personnel after their war tours

115. Injury Surveillance in a Canadian Forces Reservist Training Camp

Vallée, M.N., Dubiniecki, C., Fang, L., Payne, E., Rolland-Harris, E., and Carew, M.

Department of National Defence

Introduction/Objective: Military personnel are particularly vulnerable to sports and military training injuries, which can reduce operational readiness and increase morbidity and mortality. To better understand injuries in the Canadian Forces (CF), the CF Injury Surveillance and Prevention System (CF ISPS) was implemented at CF Base Valcartier in 2010 and was utilized in a seasonal reservist training Camp known as Camp Vimy (CV) during the summer of 2011 and 2012.

Methods: All injured personnel presenting to the CV medical clinic completed the patient injury questionnaire. Univariate and bivariate analyses identifying the frequency and types of injuries will be performed for 2011 and 2012. Injuries for each time period will be described.

Results: In 2011, the overall rate of injuries at CV was 134.3 per 1000

personnel. The activities most frequently associated with injury were the forced march, field exercises and running. The data showed that there were 898 days of sport restrictions and 635 days of military training restrictions assigned as a result of injuries. 2012 CV results will be available soon. A comparison of injury patterns will be highlighted and discussed in this poster.

Conclusion: This study found that injuries were responsible for morbidity and medical employment limitations in a CF reservist camp in 2011. These findings may be applicable to other CF Army reserve training camps. The CF ISPS is a flexible injury surveillance system that can be successfully adapted to other military groups to provide detailed information about the occurrence of injuries in order to develop targeted prevention measures.

116. Relations Between Canadian Combat Veterans' PTSD Symptoms and Behavioral Problems in Their Children: A Pilot Study

Walsh, T., Adduri, C., Boivin, M., Robertson, C. and Klassen, K.

Deer Lodge Centre OSIC & University of Manitoba

Introduction/Objective: There is a small but emerging literature on the relation between veteran parents' PTSD and the social, emotional, and behavioral problems in their children. The primary purpose of the present study was to (1) examine these problems in children of Combat Veterans with PTSD symptoms; and (2) compare parental reports of these problems in their children. The secondary purpose of this study was to assess the feasibility of the study procedures so as to guide the planning of a larger-scale correlational study about the phenomenology of combat-related PTSD.

Methods: The participants for the pilot study were 18 male clients (at one of the two participating OSI Clinics) and their respective spouses for 12 of the clients. The Combat Veterans and their spouses completed a Child Behavior Checklist (CBCL) for each child residing with them between the ages of 3 to 18 years (N of children = 38). The Combat Veterans also completed a PTSD Checklist – Military Version (PCL-M).

Results: As a group, the children were not reported by either parent to exhibit clinically significant levels of total, internalizing or externalizing behaviors but there were significant positive correlations between level of Combat Veterans' PTSD symptoms and behavior difficulties. Similar relations were found using both informants.

Conclusion: The study provides preliminary information regarding the emotional and behavioral impacts of Combat Veterans' PTSD on their children and highlights several possible areas of future study. With the reported increasing prevalence rates of PTSD in veterans the need for further investigation into the phenomenology of Combat Veteran PTSD and the associated impact on families is warranted.

117. Literature Review on Rural and Urban Disparities in Military Veteran Well-being

Watkins, K.

Director General Military Personnel Research and Analysis

Introduction/Objective: While the majority of Canadians reside in urban areas, a notable portion, particularly in Northern and Atlantic Canada, live in rural regions. Residential differences go beyond location. For instance, urban dwellers often report greater education and income levels than their rural counterparts (e.g., West & Weeks, 2009). Also, research in the Canadian general population has found that rural residents tend to be less likely to receive specialty care services (Courteau et al., 2010) and practice preventive health behaviours (Sibley & Weiner, 2011). This study investigated differences in well-being based on rural or urban residence among military veterans.

Methods: A review of the existing literature was conducted. PsycINFO, PsycARTICLES, Google Scholar, and PubMed were searched using the keywords "military" or "veteran," "rural," "urban," and "health." A total of 20 relevant articles, primarily from US samples, was returned. Studies were synthesized to identify themes and trends.

Results: In general, rural veterans reported poorer health status, particularly in terms of physical functioning. However, urban veterans tended to be more likely to receive care. Distance to health care facilities consistently emerged as a cited barrier to care for rural veterans, particularly for specialty services, such as mental health treatment. As such, insufficient health care provision likely accounts, at least in part, for these rural-urban discrepancies in well-being. Nevertheless, other variables, such as income and cost, health behaviours, and social support must be considered as potential contributors.

Conclusion: Military veterans residing in rural communities tend to experience greater health impairments than those who live in urban settings, partly due to a lack of access to health care. Implications for future research with the Canadian Forces, as well as for Veterans Affairs Canada services, will be discussed.

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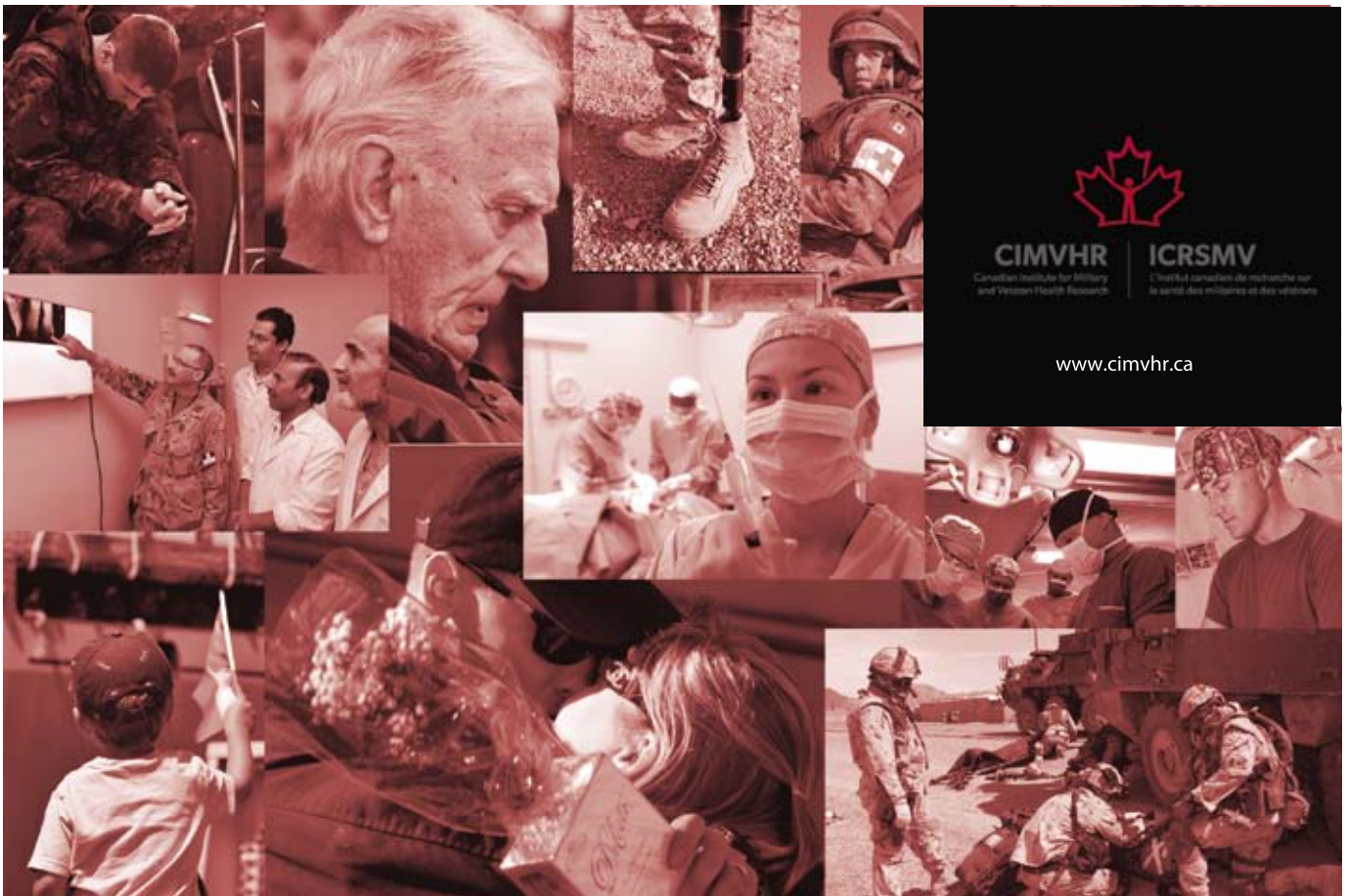
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