PAIN SYNDROMES – FROM RECRUITMENT TO RETURNING TROOPS
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Sub-Series E: Human and Societal Dynamics – Vol. 91
ISSN 1874-6276 (print)
ISSN 1879-8268 (online)
Pain Syndromes –
From Recruitment to Returning Troops

Wounds of War IV

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IOS Press
Amsterdam • Berlin • Tokyo • Washington, DC
Published in cooperation with NATO Emerging Security Challenges Division
Preface

This Advanced Research Workshop (ARW), “Wounds of War IV: Pain Syndromes – From Recruitment to Returning Troops,” was convened to discuss the topic of increased pain syndromes in service men and women around the world. Research has shown that those who have served in both combat missions and peacekeeping operations are at an increased risk for pain syndromes. Research suggests that this may result from their “wounds of war.” Some wounds may be more “invisible,” such as suicide, depression, stress and traumatic brain injury, while others are more visibly apparent, such as physical disabilities.

During this workshop, we discussed many aspects of pain and how to effectively deal with this issue. Specifically, some of the questions addressed were:

1. The Vulnerability to Pain syndromes: Are certain types of people at a higher risk for pain syndromes (background, ethnicity, childhood trauma, etc.)?
2. The Diagnosis and Assessment Issues of Pain Syndromes: Which methods are used to diagnose and assess pain?
3. The Treatment of Pain Syndromes: What are the latest treatment and therapy opportunities for soldiers who experience pain syndromes?
4. Clinical Updates on Pain Syndromes: What can we learn from recent clinical updates on pain syndromes?

Through this workshop, we have come closer to understanding what programs are already in place in various countries for detection, assessment, prevention, and treatment. Through the presentation of these existing plans, practitioners can start to formulate a more common set of best practices and guidelines which can be implemented throughout organizations in countries worldwide with the common goal to always seek to serve our service members more effectively.

This ARW has given participants an opportunity to foster essential international collaborative research on pain syndromes, a common and disabling consequence of war, terrorism, and natural disasters. As a result, it represents an important landmark in efforts to help soldiers and civilians of NATO and partner nations become more resilient in the face of international conflict.

The full papers within this publication focus on the key presentations during the workshop, act as the permanent record of this event and provide tangible documentation of the ideas that formed the basis of discussion and collaboration at the workshop. This text is organized to mirror the program from the event so as to provide an overview of the ideas of presenters and participants in the ARW.

Financial support for the workshop was provided by several sponsors. We would like to acknowledge the generous contributions of the NATO Science for Peace and Security Programme, the Croatian Ministry of Health and Social Welfare, the Austrian Ministry of Defence (MOD), the University Hospital Dubrava, the Virtual Reality Medical Institute, the Interactive Media Institute and the Virtual Reality Medical Center.
The workshop was organized and this accompanying publication was compiled and edited jointly by the Interactive Media Institute, San Diego, California, USA and Virtual Reality Medical Institute, Brussels, Belgium. Professor Dr. Brenda K. Wiederhold and Professor Dr. Krešimir Ćosić, as conference co-chairs, selected and invited the majority of the speakers and participants. Conference coordinator Mr. James Cullen organized logistics including registration, travel, lodging and meals, assembling of workshop materials, and other arrangements for the ARW. Prof. Dr. Wiederhold chose the beautiful Austrian location where the event took place and Mr. Daniele Pizzioli helped with registration and on-site direction for attendees. Ms. Emily Butcher, Ms. Allison Ines and Ms. Christina Valenti reviewed the conference program and full manuscripts, helping with editing and assembly of this and other associated texts.
Introduction

Twenty-seven scientists and representatives from NATO and partner countries met in Südkärnten, Austria on 30 September-2 October 2011 for the three-day NATO Advanced Research Workshop titled “Wounds of War IV: Pain Syndromes – From Recruitment to Returning Troops.” Formal scientific presentations were delivered by experts from ten different countries who were invited to take part in the workshop.

The workshop was divided into four scientific sessions:

1. Session I: Vulnerability to Pain Syndromes
2. Session II: Diagnosis and Assessment of Pain Syndromes
3. Session III: Clinical Updates on Pain Syndromes
4. Session IV: Treatment of Pain Syndromes

Papers and Presentations

Presenters were invited to submit a full paper for publication in this volume in order to enable those who could not attend the workshop to become educated on the issue of pain syndromes in our troops. Their papers, which are in-depth descriptions of their presentations, are briefly described below.

The first session, “Vulnerability to Pain Syndromes,” discusses whether certain types of people are at higher risk of developing pain syndromes and if they might be affected by factors such as background, ethnicity and childhood trauma. The opening paper by Dr. Robert Bray, “Misuse of Prescription Pain Medications in U.S. Active Duty Service Members” addresses the prevalence of prescription opioid misuse in the active duty military population. Dr. Bray examines trends in misuse, the role of prescription pain medications in prescription drug misuse and the correlates and predictors of prescription drug misuse and prescription pain medication misuse among the active duty military population.

In the second paper Cmdr. Dr. Jack Tsao explores “Theories of Phantom Limb Pain (PLP) and Use of Mirror Therapy.” Tsao points to case studies using mirror therapy that have shown the treatment’s ability to effectively relieve pain and cramping in amputated limbs and discusses ways in which this therapy can be implemented for sufferers of PLP.

Next, Christine A. Henriksen presents “An Examination of the Relationship Between Childhood Adversity and Mental Disorders in the Canadian Military.” This
presentation paper discusses research showing that exposure to adverse childhood experiences, such as childhood physical and sexual abuse and economic deprivation, is linked to developing numerous mental and physical health problems in adulthood, including major depressive disorder, Posttraumatic Stress Disorder, and panic attacks, and exposure to combat further increases this likelihood.

In the following paper, Natalie Mota focuses on “The Physical and Mental Health of Female Military Personnel,” discussing issues such as existing resources for the health needs of female military personnel, current knowledge on the physical and mental health of service women as compared to service men, and unique stressors faced by service women. Findings point to the need to adequately educate health professionals treating female military personnel and the unique health conditions they experience.

In the last presentation of the session, Dr. Alja Videtić Paska presents “Behind Pain: Genetics.” This paper stresses the importance of genetic background and epigenetic factors, as well as environmental effects, on the large variability of pain responses. This growing field focuses on research identifying candidate genes involved in pain mechanisms, and supports the development of personalized pain control and management.

Session two of the workshop, “Diagnosis and Assessment of Pain Syndromes,” focuses on concerns related to the diagnosis and assessment of pain syndromes. In the first paper of the session, “The National Institutes of Health Pain Consortium’s Efforts to Improve Pain Education in Medical, Dental, and Nursing Schools Using the ‘Centers of Excellence’ Model,” Dr. David Thomas explores the link between rising rates of opioids prescribed to treat patients suffering from pain and a rise in prescription opioid abuse. Pointing to a lack of adequate education on the topic for healthcare providers across multiple sectors, Dr. Thomas calls for an increase in awareness, funding, and education, particularly through the implementation of the National Institutes of Health’s Pain Centers of Excellence education institutions to teach healthcare providers how to better treat and manage their patients’ pain.

Next, Dr. Peter Pregelj presents “Psychological Pain and Suicidal Behavior,” pointing to the devastating effects of psychological pain and its influence on suicidal behavior, the similar ways in which the body and brain respond to physical as well as mental pain, and the relationship between genes and environmental factors involved in suicidal behavior. Exposure to painful and provocative experiences, such as combat, can further contribute to fearlessness towards death and increased physical pain tolerance, factors which can lead to suicide.

In the following paper, “A Review of Pain Management Techniques for Military Populations,” Prof. Dr. Brenda K. Wiederhold discusses the unique situations service men and women are exposed to and the resulting traumatic injuries leading to pain syndromes, the high incidence of comorbidity involving pain syndromes and psychiatric disorders, and lastly, promising new treatments to manage pain, including Virtual Reality (VR) exposure, biofeedback, and cognitive behavioral therapy, among others.

Lastly, Prof. Dr. Nela Pivac presents “Neurobiological Basis of Pain Syndrome in War Veterans with Posttraumatic Stress Disorder (PTSD): Preliminary Findings” in which the connection between pain syndromes and PTSD is discussed. Topics include the linked severity of the two syndromes, the neurobiological mechanisms underlying altered pain perception, and the resulting effect on biomarkers that could help lead to earlier diagnosis and better treatment of pain syndromes.
In session three, “Clinical Updates,” presenters discuss new updates in the field for pain syndromes. Firstly, doc.dr.sc. Jasna Grkovic presents “Diversity of Pain Syndromes in War Veterans with Posttraumatic Stress Disorder.” The paper presents clinical cases and looks at pain syndromes as a part of the spectrum of posttraumatic reactions that affect military members long after returning from the battlefield and the overlap of physical and mental symptoms that are so common to this group.

In the second paper, “Biofeedback/Neurofeedback Treatment of PTSD War Veterans with Chronic Pain Syndromes: Case Reports,” Dr. Jambrošić Sakoman studies the relationship between PTSD and chronic pain using two war veterans who were treated using biofeedback/neurofeedback (BFB/NFB) to treat symptoms that were resistant to traditional forms of therapy. In the case studies, BFB/NFB was used as an add-on therapy and the treatment efficacy is discussed using psychophysiological measures and clinical scales, along with the patients’ subjective reports.

In the following paper, Anna Wachowiec presents “Death Rescued Him from Pain – A Report of Complex Therapy of ISAF Polish Soldier with an Extreme Multi-Organ Injury.” This paper describes the case study of a young man injured in battle from an improvised explosive device, which resulted in multiple traumatic injuries and an 18-month rehabilitation period before complications related to his injuries resulted in his death.

In the concluding paper of the session, Anna Rączkowska presents “Body Pain in PTSD – A Case Report on Psychodermatosis in Polish Veteran of ISAF.” This paper also discusses the case study of a soldier who developed lesions on his hands and feet. The lesions were resistant to treatment until it was discovered that the patient suffered from PTSD and applied psychotherapy resulted in remission, as well as an improved quality of life and mental state.

In session four, “Treatment,” presenters discuss existing types of treatment for pain syndromes. The first paper, “Global Health Initiatives for Pain and Suffering: Just Mitigate or Eliminate? (An Integrative Medicine and Holistic Approach for the Full Pain Spectrum while Optimizing Human Performance)” presented by Dr. Nisha N. Money speaks to the U.S. military’s increase in the use of complementary and alternative medicine (CAM) therapies to enhance traditional treatment of pain, psychological and bio-physiological wounds of war. The latest CAM techniques, modalities and research are discussed as well as the ways in which they can reduce the use of pain medications and negative consequences including side effects, misuse and abuse, and dependency.

Secondly, in “Comparing Distraction/Relaxation Modalities with Chronic Pain Patients,” Major Melba Stetz touches on the use of cognitive-behavioral techniques to manage pain. Mental imagery, in particular, can be enhanced using VR and Major Stetz discusses whether VR enhances the effectiveness of traditional somatic body imagery techniques to alter the perception of chronic pain.

Next, Prof. Dr. Liviu-Daniel Galatchi presents “Risk Assessment for Emergency Situations” focusing on controlling the risk to human health during emergency situations, including mental and physical pain syndromes, involving the following outlined steps: hazard identification, dose-response assessment, exposure assessment and risk characterization. In the full paper these steps are discussed in-depth and ways in which they can be carried out to maximize the protection of and effect on personnel, soldiers, and civilians involved in a high-risk situation.

The following paper, “Stress Prevention May Reduce Pain: Concepts and Programs of Prevention in the German Armed Forces” by Dipl.-Psych. Herbert Jacobs
explores the close relationship between psychological health and pain. He discusses prevention programs in the German Armed Forces, which follow a “Framework Regulation for Coping with Psychological Stress of Servicemen” and a shift to focus specifically on psychological fitness. These programs will include regular screening measures aimed at reducing mental and physical pain among service members.

Next, in “Chronic Low Back Pain in Chronic Combat-related Posttraumatic Stress Disorder,” presented by Marijana Bras, the relationship between PTSD and chronic lower back pain is discussed, as well as the need for a multidisciplinary approach to treatment for patients with the two comorbid conditions. The result aims at optimizing treatment and making care more cost-effective.

Lastly, Prof. Dr. Krešimir Ćosić presents “Pain Management by Multimodal Cognitive Regulation” which explores the multidimensional nature of pain including the concept of the pain mental state vector, some aspects of the neurobiology of multimodal cognitive regulation of pain, and the potential for Virtual Reality to provide attentional distraction, resulting in decreased pain.

**Working Group Sessions**

In addition to the presentations, the workshop provided ample opportunities for informal discussions and brainstorming. As part of the meeting, three specialized working groups convened on the second day to allow participants to further examine the research presented during the sessions. Working group leaders presented summaries of their discussions to the conference on the final day and time was provided for open discussion.

The first work group, focusing on the diagnosis and assessment of pain syndromes, was moderated by Dr. David Thomas. Opportunities where pain and suffering in soldiers could be eased were discussed. The group identified three periods throughout a soldier’s life where assessment is critical to relieving overall pain and suffering: pre-deployment, combat, and post-deployment. Even though pain and suffering are low or non-existent during pre-deployment, it is important to measure pain and suffering in soldiers at this time to identify strengths and vulnerabilities that could be useful for avoiding future pain, and also to establish baseline information so that change over time can be measured. Urgent and personalized care during combat is important to ensure survival, and should be carried over into post-deployment where pain and suffering grow more complex and develop into chronic conditions. The group concluded that comprehensive care through the different stages of a soldier’s life should be taught more frequently among medical professionals and studied more extensively in the clinical setting to ensure that best practices are discovered and employed.

The second work group, led by Dr. Nisha Money, focused on the treatment of pain syndromes. The group developed a comprehensive pain management protocol to serve as a framework for treating the full spectrum of pain, based on an interdisciplinary and multimodal approach of prevention, assessment, and treatment that can be utilized in different settings. The group devised a spectrum of treatment that acknowledged that pain consists of an inseparable blend of the physical and psychological, among many other factors. The spectrum was based on a seven-step concept that addressed pain on both an individual and community level through the education of the complexity of pain, by creating an initial partnership between the healthcare provider and patient,
addressing and creating an external healing environment, and included the professional assessment and diagnosis of pain, devising an interdisciplinary and multidimensional treatment approach, exploring the characteristics of different pain management techniques, and reframing pain for growth and resilience. These steps promote personalization through their flexibility to best suit individuals and general populations that suffer from pain.

doc.dr.sc. Jasna Grkovic acted as the moderator for the third work group, which addressed clinical updates on pain syndromes. The group discussed what knowledge exists regarding pain syndromes and how specific differences between European countries affect the current knowledge and practices related to the assessment, prevention, and therapy of pain syndromes. It was agreed upon that comprehensive and multidisciplinary approaches to pain syndromes are vital in the diagnosis and treatment of pain syndromes. Education and training on pain syndromes, group cohesion and social support for people suffering from pain syndromes, and the accessibility of services were also main topics discussed. The group came to the conclusion that a personalized and tailored approach to caring for those who suffer from pain syndromes is possible with a comprehensive, well designed, stepped model that also takes into account cultural aspects of the affected.

The sessions encouraged informal debate and discussion in the hopes of creating new ideas and solutions for the problem of pain syndromes in returning troops. In this way, the groups helped to provide a general overview of areas in need of improvement in the field of pain syndromes and directions for future growth.

Summary

The fundamental aim of the ARW was to critically assess the existing knowledge on pain syndromes and identify directions for future actions. Experts who presented their findings indicated that those who have served in both combat missions and peacekeeping operations are at an increased risk for developing pain syndromes.

Final conclusions reached by participants at the conference indicate that: 1) research on pain syndromes must begin to look 5-10 years ahead instead of 3-6 months ahead in regards to training, assessment, diagnosis, and treatment; 2) countries must work together to pool research on both prevention and treatment strategies for dealing with at-risk active duty and veteran populations; and 3) additional workshops are required for a more detailed discussion of each “wound of war.” Recommended specialized workshop topics were physical disability, substance abuse, and impact on military families and relationships.
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Session I: Vulnerability to Pain Syndromes

“Misuse of Prescription Pain Medications in U.S. Active Duty Service Members”
Dr. Robert Bray

“Theories of Phantom Limb Pain and Use of Mirror Therapy”
Cmdr. Dr. Jack Tsao

“An Examination of the Relationship Between Childhood Adversity and Mental Disorders in the Canadian Military”
Christine A. Henriksen

“The Physical and Mental Health of Female Military Personnel”
Natalie Mota

“Behind Pain: Genetics”
Alja Videtić Paska

Session II: Diagnosis and Assessment of Pain Syndromes

“The National Institutes of Health Pain Consortium’s Efforts to Improve Pain Education in Medical, Dental, and Nursing Schools Using the ‘Centers of Excellence’ Model”
Dr. David Thomas

“Psychological Pain and Suicidal Behavior”
Dr. Peter Pregelj

“A Review of Pain Syndromes”
Prof. Dr. Brenda K. Wiederhold

“Neurobiological Basis of Pain Syndrome in War Veterans with PTSD: Preliminary Findings”
Prof. Dr. Nela Pivac

Session III: Clinical Updates on Pain Syndromes

“Diversity of Pain Syndromes in War Veterans with Posttraumatic Stress Disorder”
doc.dr.sc. Jasna Grkovic
“Biofeedback/Neurofeedback Treatment of PTSD War Veterans with Chronic Pain Syndromes: Case Reports”
Dr. Jambrošić Sakoman

“Death Rescued Him from Pain – A Report of Complex Therapy of ISAF Polish Soldier with an Extreme Multi-Organ Injury”
Anna Wachowiec

“Body Pain in PTSD – A Case Report on Psychodermatosis in Polish Veteran of ISAF”
Anna Račzkowska

Session IV: Treatment of Pain Syndromes

“Global Health Initiatives for Pain and Suffering: Just Mitigate or Eliminate? (An Integrative Medicine and Holistic Approach for the Full Pain Spectrum while Optimizing Human Performance)”
Dr. Nisha N. Money

“Comparing Distraction/Relaxation Modalities with Chronic Pain Patients”
Major Melba Stetz

“Risk Assessment for Emergency Situations”
Prof. Dr. Liviu-Daniel Galachi

“Stress Prevention May Reduce Pain: Concepts and Programs of Prevention in the German Armed Forces”
Dipl.-Psych. Herbert Jacobs

“Chronic Lower Back Pain in Chronic Combat-related Posttraumatic Stress Disorder”
Marijana Bras and Veljko Djordjevic
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Workshop organizers Interactive Media Institute and Virtual Reality Medical Institute would like to thank the sponsors of this Advanced Research Workshop listed below. Without their support, this event could not have taken place.

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University Hospital Dubrava
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