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HUMAN PERFORMANCE OPTIMIZATION

An Ongoing Series

Pain as a Barrier to Human Performance *A Focus on Function for Self-Reporting Pain With the Defense Veterans Pain Rating Scale*

Chester "Trip" Buckenmaier III, MD; Kevin T. Galloway, BSN, MHA;
Rosemary C. Polomano, PhD, RN, FAAN; Patricia A. Deuster, PhD, MPH, FACSM

ABSTRACT

The intense physical demands and dangerous operational environments common to Special Operations Forces (SOF) result in a variety of painful conditions, including musculoskeletal pain, headaches, and acute and chronic pain from combat injuries. Pain is a well-accepted barrier to human performance. The Pain Management Task Force and the development of the Defense Veterans Pain Rating Scale (DVPRS) are discussed to provide a framework for changing the culture of pain management away from intensity of pain to interference with function and performance. The emergence of complementary and integrative pain management (CIM) practices is briefly reviewed as viable alternatives to the traditional reliance on opioids and other prescription medications. The SOF community can be the change agent for the DVPRS and CIM approaches to pain management, which will in the end serve to accelerate recovery and return SOF operators to duty faster and with an enhanced ability to perform with less pain.

KEYWORDS: *complementary; integrative; DVPRS; validation; pain measurement; pain scales; military pain*

Introduction

In previous issues of the *Journal of Special Operations Medicine*, we have described approaches for optimizing performance and suggested practical ways to implement/apply reasonable performance sustaining/enhancing interventions.¹⁻⁵ In this report, we introduce what we perceive as a barrier to human performance—pain—which is a reality in SOF. Ibuprofen, or Vitamin M, is typically a daily friend, and a source of concern along with the widespread use of other pain medications.⁶ The intense

physical demands and dangerous operational environments common to SOF result in a variety of painful conditions to include musculoskeletal pain,⁷ headaches,⁸ and acute and chronic pain from combat injuries.⁹⁻¹¹

Musculoskeletal pain is very common—specifically, low back^{12,13} and joint pain.¹⁴ Low back pain has been cited as the most common reason SOF and other military personnel seek healthcare services.¹⁵ Between 50% and 92% of helicopter aircrew experience low back pain¹⁶ and 56% to 85% experience neck pain.¹⁷ Importantly, studies demonstrate that such pain is related to compromised psychological health and sleep disturbances.¹⁸⁻²⁰ Bryan et al.²¹ noted that over 50% of US Air Force Pararescuemen and Combat Rescue Officers reported musculoskeletal pain, and this pain was associated with more alcohol and caffeine consumption than in those without pain. Pain is also a reality reinforced by virtue of having to wear body armor and repeated carrying of heavy loads.²² Thus, actionable measures of pain—to include the degree to which pain affects human performance—must be used to signal countermeasures for correcting pain and optimizing performance.

Other studies have indicated that although the magnitude of pain is likely correlated with how an individual performs,²³⁻²⁵ this might not seem as relevant to SOF where simply acknowledging pain is uncommon and contrary to the SOF culture. The orientation among many of those in the military that “pain is weakness leaving the body” can often result in delaying necessary treatments and adversely impact one’s ability to perform the mission. Pain, regardless of whether it is actually reported or measured, impacts function and performance. This issue will provide insight into a new methodology

and context on measuring and reporting pain and provide a brief overview of self-management techniques. This updated approach is aligned with promoting function and intended to identify treatments and actions aimed at functional improvement and performance factors rather than only a decreased intensity of pain.

Military leaders note that pain in Servicemembers returning from deployments negatively affects readiness and significantly hampers the recovery and rehabilitation of combat wounded and injured Servicemembers.²⁶ Further, chronic pain, traumatic brain injury (TBI), and posttraumatic stress disorder (PTSD) have emerged as a common constellation of symptoms associated with blast injuries and are termed the “polytrauma triad.”²⁷ The detrimental synergism of these conditions degrades the physical, emotional, and social health of the force.^{27,28} Additionally, the increasing morbidity in Servicemembers being treated with prolonged courses of opioid medications for chronic pain issues may reflect the sole focus on pain intensity, rather than on function and performance.²⁹

Background

In response to the growing health concerns associated with pain and its management within the military, a comprehensive evaluation of pain management practices was performed by a designated team of clinical experts from the Army, Navy, Air Force, and Veterans Health Administration (VHA). The subsequently released Pain Management Task Force (PMTF) report, published in May 2010, contained 109 recommendations to improve pain care throughout the Department of Defense (DoD) and VHA healthcare systems.³⁰ A major finding from the PMTF was the consistent negative feedback regarding the value of the visual analog scale (VAS) and the 11-point numeric rating scale (NRS) (0 = no pain, 10 = worst pain imagined) as a tool for discussing and managing pain. Clinicians at all levels noted the inconsistent administration of the VAS scale, subjective nature of the information, and the lack of functional anchors to the numeric responses. Overall VAS assessments were of low value in guiding pain therapy. The PMTF determined that a new pain assessment tool capable of providing consistent and actionable data throughout all the roles of care was needed. Table 1 outlines the requirements put forward by the PMTF for the proposed new tool.

Armed with these requirements, the PMTF used the best available pain scale research and clinical experts to develop the Defense and Veterans Pain Rating Scale (DVPRS) with the objective of validating the scale within the military and VHA healthcare systems.²⁷ Eventually, the new scale would be integrated as the federal medicine standard. At the enterprise level, this

Table 1 Requirements Put Forward by the Pain Management Task Force as Critical for a New Metric for Assessing Pain

Validated
• Able to measure pain intensity, mood, stress, biopsychosocial impact, and functional impact
Objective and useful in evaluating treatment effectiveness
• Practical and adaptable to multiple clinical settings and scenarios throughout the continuum of care (e.g., battlefield, transport, combat support hospital, primary care, medical center, pain medicine specialty services) • Easily adapted and integrated into DoD and VHA computer medical databases • Standardized into all levels of medical training across all roles of care (e.g., useful for the medic, the ward nurse, the primary care provider, the pain researcher, and the pain management specialist)
Consistent with current validated pain research tools¹³

effort was deemed particularly important because the inconsistent administration and known subjectivity of patient response to the NRS: the data being obtained were of questionable value (outside of a controlled clinical research projects) beyond a single provider–patient interaction.³⁰ After nearly a decade of ongoing military combat operations, the actual impact of pain battlefield casualties remains ill defined. PMTF members firmly believed that standardizing and optimizing the “pain question” throughout all roles of care would provide the first reasonably objective and actionable pain data from a modern battlefield, during evacuation, and throughout all the roles of care.³⁰

Closer to the tactical level, another important driver for changing the way patients were being queried about pain is the growing problem across the nation regarding the overuse, abuse, and diversion of prescription pain medications, particularly opioids.^{31–34} The Centers for Disease Control and Prevention (CDC) designated this problem as an “epidemic” in the United States.³¹ The *Presidential Memorandum: Addressing Prescription Drug Abuse and Heroin Use*, published in October 2015, directs federal medicine to develop innovative solutions to combat what is likely an unintended consequence of focusing on pain intensity.³⁵ Military medicine is not immune to these issues and challenges.

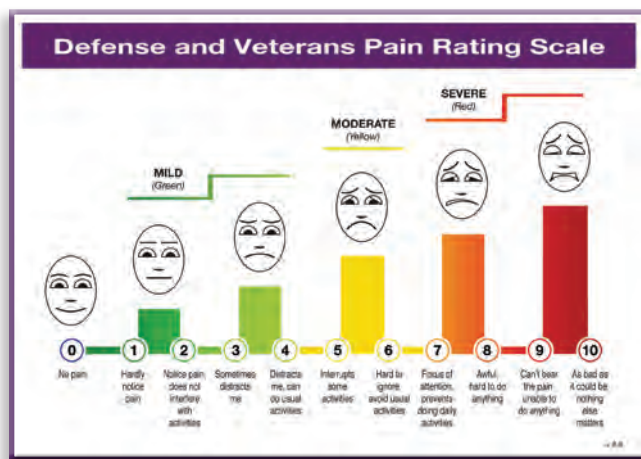
The Defense and Veterans Pain Rating Scale

PMTF members recognized the utility and advantages of working with the existing NRS scale, which was well recognized by patients and providers. Development of the new scale focused on enhancing the NRS with visual cues and functional word descriptors that would provide patients with a more objective method of selecting a number representing their pain level based on perceptual experiences and the functional limitations imposed by the pain.³⁶ Other issues considered included language, age and cultural barriers to effective communication

with patients. In addition, the use of zero, mild, moderate, and severe pain levels corresponding to the pain intensity colors and bars was included to conform to the 4-point pain scale used by the United Kingdom and other North Atlantic Treaty Organization (NATO) military partners.³⁷

Perhaps the most important evolution on this new scale was the integration of functional language anchors aimed at recasting the experience of pain in terms of functional disturbance as it relates to pain intensity. Figure 1 presents the DVPRS. As noted, the use of consistent “functional language” aligned on the 11-point scale at each numeric incremental pain level provides consistency in patient-reported determinations of pain levels, which was previously lacking with existing measures.³⁶

Figure 1 Defense and Veterans Pain Rating Scale (DVPRS).



Although achieving a pain level of zero seems intuitively desirable for both patients and providers, it is often an unrealistic goal particularly with complex traumatic injuries and chronic pain conditions often complicated by numerous other factors such as PTSD, TBI, depression, and anxiety. Healthcare providers who strive to reach zero pain levels in patients through the use of long-term aggressive pharmacological pain management regimens, especially with opioids, often do so at the expense of a patient's quality of life, interpersonal relationships, and subsequent risks for opioid misuse, abuse, and addiction. Many clinicians term this practice “chasing zero.” Evidence suggests the incidence of opioid-induced adverse effects increases significantly after implementing policies to titrate opioids to a specific NRS number.^{38,39} “Chasing zero” often leads to an erroneous focus on reducing pain intensity as the sole measurement of pain management success and may be an unintentional driver of the current prescription opioid problem within the United States.⁴⁰ The DVPRS design is the first and perhaps the most fundamental step at changing the way both healthcare providers and patients discuss painful

conditions as well as how they measure what constitutes successful pain management.

Importantly, the DVPRS incorporates four supplemental questions with numeric ratings (0–10) that allow a patient to identify how much his/her pain interferes with physical activity and sleep and how it affects mood and contributes to stress. All of these dimensions of pain assessment represent basic and important areas for improving our understanding of how pain influences a person's life (Figure 2). These supplemental questions are extremely useful indicators for assessing the effectiveness of therapeutic pain care plans. It is not uncommon for persons with chronic pain to remain relatively static in their reported pain intensity levels for protracted periods of time, but these people may demonstrate positive changes in other quality-of-life indicators consistent with a therapeutic effect from pain treatment. By including the supplemental questions across multiple episodes of care, improvements in activity, sleep, mood, and stress can be recognized and documented; previously, we might have missed the improvement when only pain intensity was followed.

Figure 2 DVPRS supplemental questions.

DoD/VA PAIN SUPPLEMENTAL QUESTIONS
For clinicians to evaluate the biopsychosocial impact of pain

- Circle the one number that describes how, during the past 24 hours, pain has interfered with your usual **ACTIVITY**:
0 (Does not interfere) 1 2 3 4 5 6 7 8 9 10 (Completely interferes)
- Circle the one number that describes how, during the past 24 hours, pain has interfered with your **SLEEP**:
0 (Does not interfere) 1 2 3 4 5 6 7 8 9 10 (Completely interferes)
- Circle the one number that describes how, during the past 24 hours, pain has affected your **MOOD**:
0 (Does not affect) 1 2 3 4 5 6 7 8 9 10 (Compulsarily affects)
- Circle the one number that describes how, during the past 24 hours, pain has contributed to your **STRESS**:
0 (Does not contribute) 1 2 3 4 5 6 7 8 9 10 (Contributes a great deal)

DVPRS Validation

As previously stated, the DVPRS required validation for it to eventually replace the tried and true NRS. The first clinical study to validate the DVPRS in a military population (N = 350), published in 2013, demonstrated acceptable internal consistency (Cronbach's $\alpha = .934$) and parallel forms reliability (when two tests with different, but similar, questions are taken in parallel) and concurrent validity (how well a particular test relates to a previously validated measure).³⁶ The DVPRS detected significantly higher pain levels and mean supplemental question scores in patients with documented neuropathic pain compared with those without documentation of neuropathic pain. Overall, the DVPRS has been described as a significant improvement over the standard

NRS,⁴¹ and other researchers found the DVPRS to be a practical primary care tool for measuring the impact of pain on daily function and as a general monitor of patient pain.⁴² Clinical research on the DVPRS continues in a variety of clinical settings, both military and civilian, but the unique and detailed features of the DVPRS standardize the approach to pain measurement and reorient patients and providers at all levels of care toward the objective of maximizing function, optimizing performance, and raising the quality of life when managing pain. This is clearly of utmost importance. For SOF, mission execution will be far easier when the contribution of pain as a barrier to performance is limited.

Where Does the DVPRS Lead Us?

Evolving the pain discussion to a focus on function and performance has other potential benefits to the military and readiness. In a culture where pain is sometimes equated with weakness, the DVPRS is a starting point for recalibrating this paradigm. Rather than dancing around pain intensity as measure of one's toughness, pain can now be discussed as it relates to performance and function and in relation to accomplishing the mission. People are not as effective at performing physical and mental tasks when they are in pain or, in some cases, medicating themselves for pain.^{16,19}

The DVPRS and related changes in the pain assessment provide opportunities to introduce a variety of nonmedication and self-management treatments that might not otherwise be considered or used if medicating the pain out of existence remained the norm. Although medications, injections, and surgeries will always have a place for treating many pain-related conditions, many non-medication, self-management, and complementary integrative medicine (CIM) modalities should also be an option for patients and providers. When viewed against the relative effectiveness and safety for many accepted and highly used drug treatments, CIM modalities appear to be viable additions to the military tool kit. Since 2011, the military pain management community has been introducing acupuncture, biofeedback, massage therapy, movement therapy (such as yoga and Tai Chi), and some mind-body techniques in pain specialty clinics with positive feedback from providers and patients.⁴³ The objectives for many of these therapies are related to increasing function and flexibility, improving sleep and mood, lowering stress, and improving overall quality of life.

Table 2 presents a brief overview of selected self-care practices that may be helpful for managing pain. With regard to myofascial pain, the use of foam rolling has become common and the literature is emerging that this may be an excellent self-care strategy.⁴⁴ The role of myofascial pain release, in particular with regard to performance, is

Table 2 An Overview of Selected Self-Care Pain Management Modalities

Modality	Comment
Yoga	Becoming a common approach to pain ⁵¹⁻⁵³
Exercise	A classic approach for managing pain ^{51,52}
Tai Chi	A therapy used for centuries to help manage pain ⁵⁴
Foam Rolling	An approach for releasing myofascial tissue and mitigating pain ^{47,55}
Mindfulness	An upcoming approach for helping to manage pain ^{53,56}
Humor	Suggested to have pain relieving properties since the 1920s ⁵⁷
Meditation	A self-care approach to diminishing pain ^{53,58}
Music	A modality receiving considerable attention for managing pain ⁵⁷
Guided Imagery	A technique used for many years to control pain ⁵³

beyond the scope of this report but deserves further attention. A brief animated video outlining this new approach to pain screening and assessment practices with instructional prompts can be found under "videos" at <http://hprc-online.org/total-force-fitness/pain-management/interactive-resources>. For additional information on self-management of pain, please also visit <http://hprc-online.org/total-force-fitness/pain-management>.

Some CIM therapies have been integrated into our military treatment facilities, with delivery methods ranging from treatments by providers inside an MTF to other techniques provided by many members of our health-care teams in a variety of settings. For example, complex acupuncture treatments are offered in an MTF by medical acupuncturists or licensed acupuncturist. In contrast, "battlefield acupuncture" or auricular acupuncture can be delivered in the troop medical clinic, to an aid station, in a field environment, or in any setting.⁴⁴⁻⁴⁷ Likewise, dry needling is an "emerging technique" that is being used within the SOF community.⁴⁷ Providers may also use basic acupressure, which can also be taught for self-management treatment at home for chronic headaches.⁴⁸ Other modalities include medical massage and biofeedback,^{43,49,50} where, again, persons can be taught self-management techniques to manage their pain without requiring a trip to the clinic or use of medications. All of these CIM approaches are changing the art of pain management in very positive ways.

Summary

Some within the military health system challenge the wisdom of changing our approaches to pain management, but we must because prescription medications for pain

are now recognized as the fastest growing drug problem in the United States.³² Changing to the DVPRS so that both function and performance are considered when managing pain is the fundamental first step to support the cultural change. This change to DVPRS will support other shifts in medical practice such as the expanded use of CIM and self-care modalities. Importantly, the emergence of evidence-based CIM practices will be central to solving the national challenges with pain and prescription opioids. It is time to make the change to the DVPRS. The SOF medical community needs to be the agent of change for pain management.

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COL (Ret) Buckenmaier, MC, USA, is director of the Defense and Veterans Center for Integrative Pain Management and professor of anesthesiology, Department of Military and Emergency Medicine, Uniformed Services Health Sciences University, Bethesda, Maryland.

COL (Ret) Galloway, AN, USA, is affiliated with the US Army Nurse Corps, Defense & Veterans Center for Integrative Pain Management (DVCIPM), and the Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.

Dr Polomano is professor of pain practice at the University of Pennsylvania School of Nursing and professor of anesthesiology and critical care (secondary) at the University of Pennsylvania Perelman School of Medicine, Philadelphia, Pennsylvania.

Dr Deuster is professor and director of the Consortium for Health and Military Performance, Department of Military and Emergency Medicine, Uniformed Services University, Bethesda, Maryland. E-mail: patricia.deuster@usuhs.edu.