OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
READINESS

The Honorable Carl Levin
Chairman
Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The enclosed report is submitted in response to section 711 of the National Defense Authorization Act for Fiscal Year 2010, which requires the Department of Defense (DoD) to develop and implement a comprehensive policy on pain management by the Military Health System (MHS) and provide a report to Committees on Armed Services of the Senate and House not later than 180 days after the date of the commencement of the implementation of the policy, and on October 1st each year thereafter through 2018. The legislation requires the report to address specific key elements, to include a description of the policy and any changes made annually, ongoing research, provider training, beneficiary education, and adequacy and effectiveness of pain management services. This issue falls under the purview of the Under Secretary of Defense for Personnel and Readiness and I have been asked to respond.

DoD developed a comprehensive policy on pain management that was implemented in March 2011. This report describes the approach taken in implementing this policy throughout MHS. It further describes the overall programmatic structure and operational elements that have been developed and deployed to date.

Thank you for your interest in the health and well-being of our Service members, veterans, and their families.

Sincerely,

Jo Ann Rooney
Principal Deputy

Enclosure:
As stated

cc:
The Honorable John McCain
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
READINESS

The Honorable Jim Webb
Chairman
Subcommittee on Personnel
Committee on Armed Services
United States Senate
Washington, DC 20510

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The Honorable Lindsey Graham
Ranking Member

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PERSONNEL AND
READINESS

The Honorable Howard P. "Buck" McKeon
Chairman
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

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The Honorable Adam Smith
Ranking Member

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WASHINGTON, DC 20301-4000

PERSONNEL AND
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The Honorable Joe Wilson
Chairman
Subcommittee on Military Personnel
Committee on Armed Services
U.S. House of Representatives
Washington, DC 20515

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The Honorable Susan A. Davis
Ranking Member

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4000 DEFENSE PENTAGON
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PERSONNEL AND
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The Honorable Daniel K. Inouye
Chairman
Committee on Appropriations
United States Senate
Washington, DC 20510

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The Honorable Thad Cochran
Vice Chairman

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The Honorable Harold Rogers
Chairman
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

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The Honorable Norman D. Dicks
Ranking Member

OFFICE OF THE UNDER SECRETARY OF DEFENSE
4000 DEFENSE PENTAGON
WASHINGTON, DC 20301-4000

PERSONNEL AND
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The Honorable C.W. Bill Young
Chairman
Subcommittee on Defense
Committee on Appropriations
U.S. House of Representatives
Washington, DC 20515

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Ranking Member

# REPORT TO THE CONGRESS

# THE IMPLEMENTATION OF A COMPREHENSIVE POLICY ON PAIN MANAGEMENT BY THE MILITARY HEALTH CARE SYSTEM

## Office of the Secretary of Defense

## September 2011

Preparation of this study/report cost the Department of Defense a total of approximately $3,580 for the 2011 Fiscal Year.

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Comprehensive Pain Management Policy

Section 711 of the National Defense Authorization Act for Fiscal Year 2010 requires the Department of Defense develop and implement a comprehensive policy on pain management by the military health care system. Specifically, the policy is required to cover each of the following:

- The management of acute and chronic pain.
- The standard of care for pain management to be used throughout the Department of Defense.
- The consistent application of pain assessments throughout the Department of Defense.
- The assurance of prompt and appropriate pain care treatment and management by the Department when medically necessary.
- Programs of research related to acute and chronic pain, including pain attributable to central and peripheral nervous system damage characteristic of injuries incurred in modern warfare, brain injuries, and chronic migraine headache.
- Programs of pain care education and training for health care personnel of the Department.
- Programs of patient education for members suffering from acute or chronic pain and their families.

Section 711 further requires the Secretary revise the policy on a periodic basis in accordance with experience and evolving best practice guidelines. The Department is also required to submit a follow-up report to Congress not later than 180 days after the date of the commencement of the implementation of the policy and on October 1 each year thereafter through 2018. Each report shall include the following:

- A description of the policy implemented and any revisions made to the policy.
- A description of the performance measures used to determine the effectiveness of the policy in improving pain care for beneficiaries enrolled in the military health care system.
- An assessment of the adequacy of Department pain management services based on a current survey of patients managed in Department clinics.

- An assessment of the research projects of the Department relevant to the treatment of the types of acute and chronic pain suffered by members of the Armed Forces and their families.

- An assessment of the training provided to Department health care personnel with respect to the diagnosis, treatment, and management of acute and chronic pain.

- An assessment of the pain care education programs of the Department.

- An assessment of the dissemination of information on pain management to beneficiaries enrolled in the military health care system.

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## EXECUTIVE SUMMARY

The most common complaint voiced by patients seeking care by physicians in the United States today is pain. More than 50 million Americans suffer from chronic pain, a condition that costs this country approximately $100 billion annually when health care expenses, lost income, and lost productivity are included. In Americans under 45 years of age, back pain is the leading cause of disability. Given the increasing prevalence of this condition and its significant socioeconomic impact, our country's health care system must adequately address the issue of pain, both acute and chronic.

There are multiple factors responsible for the variability observed in the practice of pain management in the U.S. health care system. Medical providers tend to have a unique and variable approach and understanding to pain management that is significantly influenced by their academic medical training, mentors, cultural beliefs, and personal experiences with pain. In addition, no single medical specialty has clear ownership of the treatment of pain, and while "pain medicine" is a relatively new medical specialty, it continues to evolve in finding its appropriate place in the medical hierarchy.

Many of the Military Health System's (MHS) challenges with pain management are very similar to those faced by medical communities throughout this country, but the MHS also faces some unique issues because of its distinctive mission, structure and patient population. The nation expects the MHS to provide the highest level of care to those carrying wars' heaviest burdens. The transient nature of the military population, including patients and providers, makes continuity of care a challenge for military medicine. Providing appropriate pain management to patients with combat-related polytrauma requires integrated approaches to clinical care that cross traditional medical specialties, not all of which are universally available across the MHS. Until now, the MHS has lacked a comprehensive pain management strategy that addressed these critical issues and distinctions. As a result, previous pain management initiatives were fragmented, often driven by local champions, and were often unsustainable.

This report describes the approach taken in implementing a comprehensive policy on pain management throughout the MHS. The information contained in this report describes the overall programmatic structure, and operational elements that have been developed and deployed to date. The appendix lists citations for multiple articles written since 2003 by DoD members that are either pending publication or have been published in world-renowned peer reviewed journals regarding the management of both acute and chronic pain. Due to the short interval from implementation of the policy to the drafting of this report, not all of the required reporting elements can be addressed fully. For example, the MHS has not yet developed performance measures or administered surveys. There also has been inadequate time to assess any education programs or disseminate information to families. It is anticipated that adequate information to address these elements will be available for subsequent reports to Congress.

## INTRODUCTION

One of the oldest and most fundamental physician responsibilities is the treatment of pain, yet even in the twenty-first century providers cannot explain fully the mechanisms responsible for acute and chronic pain nor how best to relieve pain and suffering. According to the Centers for Disease Control and Prevention and the American Academy of Pain Medicine, pain is the most frequent reason patients seek physician care in the United States. It places significant burdens on patients, families, medical providers, and employers, and affects more Americans than diabetes, heart disease and cancer combined. When including health care expenses, lost income, and lost productivity, the annual cost of chronic pain in the United States is estimated by the National Institutes of Health at $100 billion.

In August 2009 the Army Surgeon General chartered a Pain Management Task Force to make recommendations for improving clinical, administrative and research processes involved with the provision of pain management care and services at U.S. Army Medical Command (MEDCOM) facilities. This Task Force, while composed with a predominance of Army personnel, also included representatives from the Navy, Air Force, TRICARE Management Activity (TMA), and Veterans Health Administration (VHA). The Task Force reviewed medical literature, Department of Defense (DoD) and Service policies and regulations, and conducted twenty-eight site visits at Army, Navy and Air Force military treatment facilities (MTFs), VHA hospitals, and civilian hospitals. The Task Force presented the Army Surgeon General with 109 recommendations that were subsequently presented to the DoD/VA Joint Executive Council (JEC). The JEC in turn chartered a work group to actively collaborate on a standardized DoD/VA approach to pain management that would improve the quality and effectiveness of care to beneficiaries of the Veterans Health Administration and the Military Health System. The DoD/VA Pain Management Work Group (PMWG) has continued to build upon the work initiated by the Army Task Force. As requested in section 711, this report will address the PMWG's accomplishments to date, along with results from the ongoing deployment of DoD's comprehensive pain management policy.

## PAIN MANAGEMENT POLICY IMPLEMENTATION

### *Comprehensive Structure*

The comprehensive pain management policy encompasses several key components, among which are pain assessment, pain treatment and management, and pain research. Each of these components in turn focuses on several key sub-components. The policy strives to reinforce that pain is not only a symptom of disease, but is often, in fact, a disease process in itself. As is the case for all disease processes, the approach taken towards treatment needs to be evidence-based and utilize best practices.

1. *Assessment of Pain*

The assessment of pain is frequently referred to as "the fifth vital sign." In fact, some states, such as California, have gone so far as to pass legislation requiring providers to assess pain when vital signs are taken. The assessment of pain is also a requirement at all MTFs. DoD Instruction 6025.13, which addresses MTF accreditation, requires all fixed hospitals and free-standing ambulatory clinics to maintain accreditation; therefore, all are reviewed and accredited by either The Joint Commission or the Accreditation Association for Ambulatory Health Care. Both of these accrediting organizations include standards that focus on a patient's right to pain management, patient education about pain and pain management, pain assessment in all patients, and a facility's collection of data on the effectiveness of pain management.

The Code of Federal Regulations, 32 Part 199.6, requires all civilian hospitals (acute care, general and special) that provide inpatient and outpatient services (to include clinical and ambulatory surgical services) "to be accredited by The Joint Commission [TJC] or meet other such requirements as the Secretary of Health and Human Services, the Secretary of Transportation, or the Secretary of Defense finds necessary in the interest of the health and safety of patients who are admitted to and furnished services in the institution." Therefore, all institutional providers who are contracted into the TRICARE network by one of the three Managed Care Support Contractors (MCSC) also must be accredited. As with DoD's MTFs, these facilities also must meet the rigorous pain management standards set forth by their accrediting organization.

The use of a common tool across the DoD and VHA for the assessment of pain is both appropriate and desirable. The most commonly used tool to measure pain in both DoD and VHA facilities is an 11-point, 0-10 Visual Analog Scale (VAS). Although this scale is broadly used, even in the civilian community, the majority of doctors, nurses, physical therapists, medics and other clinicians who were interviewed as part of the work performed by the Army Task Force reported negative feelings about the VAS Pain Scale. They found the scale to be inconsistently administered, felt it to be very subjective with no functional anchors, and felt that assessments recorded in patient medical records had little value. Given these findings, the Task Force felt it was necessary to develop a new tool that was validated, and able to measure pain intensity, mood, stress, biopsychosocial impact, and functional impact. It needed to be 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); and consistent with current validated pain research tools.

Given the above background and requirements, the PMWG has given its endorsement to pursuing a more in-depth analysis of an alternative pain assessment tool known as the Defense/Veterans Pain Rating Scale. This tool, developed by the Defense

and Veterans Center for Integrative Pain Management (DVCIPM) is currently undergoing a validation study, and appears to be promising. However, it will require additional testing and validation before it can be considered reliable for routine use throughout the MHS and VHA. If proven to be scientifically valid, however, it will be a much stronger tool for clinicians to utilize in their evaluation and treatment of acute and chronic pain.

2. *Pain Treatment and Management*

The MHS currently lacks a consistent, widely disseminated pain management philosophy with published standards for pain management structure, capabilities, or personnel for military clinics, hospitals, or medical centers. In an effort to implement standards for the treatment and management of pain in its facilities, the Army Surgeon General published OPERATION ORDER 10-76 (USAMEDCOM COMPREHENSIVE PAIN MANAGEMENT CAMPAIGN PLAN) in October, 2010. This OPORD builds upon the recommendations from the Army Task Force and seeks to "establish an Army Medical Department (AMEDD) comprehensive pain management plan that is holistic, multidisciplinary and multimodal in its approach, utilizes state of the art science modalities and technologies, advances pain medicine through education and research programs, and provides optimal quality of life for Soldiers and all patients with acute and chronic pain throughout the continuum of care."

The vision reflected in OPORD 10-76 is mirrored in the work being performed by the PMWG and the other Services. Central to the pain management strategies for both of these groups is the effective use of the Patient Centered Medical Home (PCMH) model; the use of evidence-based medicine to include Clinical Practice Guidelines (CPG); timely and appropriate referral for specialty care; and knowledge and training for providers commensurate with the level of care they provide.

A. *Patient Centered Medical Home*

The Patient Centered Medical Home (PCMH) provides a comprehensive, integrated approach to primary care. It incorporates a number of principles that facilitate a holistic approach to patients with simple and complex medical needs and also facilitates partnerships among individual patients, their primary care physicians (PCP), and when appropriate, their families. In the PCMH model, the PCP leads a team of healthcare professionals who collectively take responsibility for the ongoing care of the patient. The PCP is responsible for either personally providing care for the patient, or for appropriately arranging treatment by other qualified healthcare professionals. This includes treatment for acute and chronic pain. The patient's care needs are coordinated and/or integrated across the entire health care system (acute and subspecialty care, inpatient care, home health care, skilled nursing care) and the patient's community (family, public and private community-based services). The PCMH facilitates education of both the patient and his/her family on the etiology and management of acute and chronic pain, which may reduce the likelihood of disability, address the under-treatment of pain, and provide for individual tailoring of treatment plans.

In September 2009, the Assistant Secretary of Defense (Health Affairs) directed all MTFs to implement the PCMH model in their primary care clinics. In response to this directive, several MTFs implemented PCMH demonstrations within their facilities to determine the best approach to implementation of the concept. In addition, during the latter half of 2010 and early 2011, the TRICARE Management Activity (TMA), with concurrence from the three Services, contracted with the National Committee for Quality Assurance (NCQA) to survey all MTFs world-wide to determine their readiness to function as an NCQA-recognized medical home. There are approximately 430 current and projected PCMH practices in the MHS' Direct Care System, which include family practice, primary care, pediatrics, internal medicine, flight medicine and undersea medicine clinics. These clinics are currently utilizing NCQA's self-assessment tool to establish their baseline level of performance for later evaluation of value and return on investment; to assess operational and IM/IT capabilities gaps; and to identify top-performing practices for selection to be recognized by NCQA in FY11 and beyond. The next step is to begin the formal NCQA recognition process, with a goal of recognizing 50 sites in the first year of this program, and adding additional sites annually based upon funding.

B. *Clinical Practice Guidelines*

In 1990, the Institute of Medicine defined CPGs as "systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances." CPGs provide guidance on the diagnosis, treatment and management of patients based upon clinical evidence obtained from an intensive, comprehensive review and analysis of the published medical literature. The recommendations within a CPG should not be viewed as sacrosanct, since a provider's clinical judgment regarding the appropriate management of each individual patient should remain paramount. Clinicians and patients must develop individual treatment plans that are customized to the specific needs and circumstances of each patient.

In 2004, the DoD/VA Health Executive Council (HEC) chartered the DoD/VA Evidence-Based Practice Work Group (EBPWG) to advise on the use of clinical and epidemiological evidence to improve the health of the population across the MHS and VHA. The EBPWG selects topics for the development of CPGs based on high cost, high volume, high risk, and problem prone conditions. To date, three CPGs have been developed related to the treatment of acute and chronic pain. These are: Opioid Therapy (OT) for Chronic Pain, Lower Back Pain (LBP), and Post-Operative Pain (POP). There are currently two additional CPGs under development related to pain management; these are: Perioperative Pain Control and Degenerative Joint Disease (DJD). It is anticipated that the perioperative pain guideline will be available for distribution sometime in the next 2–3 years, and that work on the DJD guideline will begin in fiscal year 2012.

While it is important to develop and implement CPGs as educational tools to align medical practice patterns with the most currently available clinical evidence, it is also

important to make them easy to use and integrate into routine provider practice. The report of the Army Task Force revealed that many DoD providers were unaware of the CPGs for pain management, and of those who were, many found them difficult to use or integrate into their practices. The PMWG is working on developing electronic solutions to embed in the Military's computerized patient medical record, the Armed Forces Health Longitudinal Technology Application (AHLTA) that would simplify the use of these CPGs by military providers. In addition, the PMWG is working to ensure that any future electronic medical record system is designed with the CPG algorithms embedded within them, enabling providers to follow these evidenced based practices more easily and to support deviation from them if other treatment approaches are more clinically appropriate.

C. *Specialty Care Referral*

In October 2009, the VHA established an integrated, biopsychosocial Stepped Care Model of Pain Management in which care for most pain conditions is delivered in the primary care setting. This Biopsychosocial Model posits that the causes and outcomes of many illnesses, including pain, often involve the interaction of physical and pathophysiologic factors, psychological traits and states, and social-environmental factors. The model incorporates, and is supported by, timely access to secondary consultation and collaborative care from pain medicine and when indicated, mental health, physical medicine and rehabilitation, and other specialties. It is an effective approach to providing a continuum of care to a population of patients with a spectrum ranging from acute pain caused by injuries or diseases to chronic pain diseases and disorders that may be expected to persist for more than 90 days, and in some instances, for the patient's lifetime. While the goal is for the primary care provider to render as much of the care as possible, consultation with pain medicine, as well as other specialists, in managing complex, severe and high risk patients may be needed. The Army Pain Task Force strongly recommended adaptation of the Stepped Care Model by the DoD. The PMWG is collaborating with the Services in their efforts to deploy this model in MTFs.

In an effort to successfully implement the Stepped Care Model, the MHS has increased the number of pain management specialists in its MTFs and in its purchased care networks to provide specialized treatment for patients who require treatment beyond that available from the primary care manager. The Army has begun deploying pain management providers to regional interdisciplinary pain management centers located at their larger facilities. Patients are either referred to a regional center, receive care at their parent facility via telemedicine, or are seen by a traveling specialist. The Navy has begun locating pain management specialists within its Patient Centered Medical Homes at its Family Practice teaching hospitals, improving access and decreasing wait times for patients who need a higher level of care. In addition, some facilities without training programs have implemented access to pain specialists on a 24-hour-per-day, 7-day-per-week basis.

DoD is currently exploring new technologies to address the problem of providing access to specialty care for patients with complex chronic diseases, such as chronic pain, who reside in areas that are relatively inaccessible to or remote from these specialized services. The Extension for Community Healthcare Outcomes (ECHO™) program which was pioneered at the University of New Mexico employs an 'academic detailing' intervention using video technology. The program offers local providers the opportunity to co-manage difficult and complex patients, while simultaneously affording them with the training and technical skills that over time allows them to become highly skilled in the treatment of these chronic and complex diseases. Ultimately, this creates a center of excellence in their own community, and diminishes the need to obtain specialty evaluations in these remote areas. ECHO™ has demonstrated lower costs and improved outcomes in the treatment of chronic diseases such as Hepatitis C. The VHA has adopted the ECHO™ model, and has begun transforming their Specialty Care Services program by developing Specialty Care Access Networks (SCAN), so that all veterans, even those distant from medical centers, will have access to specialty level care for chronic disease management when needed. DoD is currently evaluating the ECHO™ program to determine if this approach could be successfully deployed to improve access to specialty services, such as pain management in remote sites and smaller MTFs.

D. *Education and Training*

Many health care professionals have little or no training in pain management and are unable to effectively respond to the pain care needs of their patients. Pain management receives very little attention in the curricula of many U.S. medical and allied health professions schools, and in fact, health care professional programs at most major medical educational and training sites do not include a dedicated pain management curriculum. The military medical training programs are no exception, and consistently mirror these deficiencies. The typical medical school may provide only four hours of instruction on the topics of basic pain physiology, opioid and non-opioid therapies, and back pain. Even when the curriculum includes some baseline information on pain management, it is seldom organized in such a way to enable students to successfully apply this knowledge to clinical practice. The lack of a consistent approach to pain management education results in considerable variation in pain management understanding and practice within all medical professions.

Given the general inadequacy of pain management training in most specialties, providers should be offered opportunities to improve their knowledge and skills treating patients with acute and chronic pain. This includes improving their awareness of medication misuse. To mitigate this deficiency, the Uniformed Services University of the Health Sciences (USUHS) has developed interactive, web-based videos to educate providers about risk factors, risk stratification and mitigation strategies for medication misuse. In addition, they have developed a core-curriculum for medical students and physicians in training on pain management and medication misuse. While these educational programs are currently being utilized at USUHS, their goal is to make them available through the Internet for all military providers by early 2012. They have also developed a series of public service announcements regarding medication misuse to air at

a future date in cities with high concentrations of military and VHA beneficiaries. Additional educational efforts will focus on identifying patients with Post-traumatic Stress Disorder and other psychological injuries which may pre-dispose them to experiencing increased pain post-operatively, increased requirements for pain control, and an increased risk for medication misuse.

3. *Pain Research*

Acute and chronic pain is ubiquitous in trauma patients, and there is a high cost for pain management in Wounded Warriors. Prior to 2010, pain management was seriously underrepresented in DoD's research investment strategy, and the widespread patient dissatisfaction with pain control and other outcomes measures suggested an urgent need for a change in this strategy. In fiscal year 2010, funding was allocated to create the Defense and Veterans Pain Management Institute (DVPMI) which allowed DoD to perform Research, Development, Test & Evaluation (RDTE) specifically for pain management. On May 13, 2011, the Assistant Secretary of Defense (Health Affairs) designated the DVPMI as a Center of Excellence, and the organization was renamed as the Defense and Veterans Center for Integrative Pain Management.

Since 2003 DoD personnel have written and published multiple articles in world-renowned peer reviewed journals regarding the management of both acute and chronic pain; several articles are also currently pending publication (see Appendix). In addition, DoD has developed several clinical protocols that are currently undergoing clinical trials in both battlefield and non-battlefield pain management. These protocols will greatly enhance the knowledge and management of acute and chronic pain, particularly for soldiers wounded on the battlefield where early intervention may prevent long term chronic pain and narcotic dependence.

4. *Defense and Veterans Center for Integrative Pain Management*

The Defense and Veterans Center for Integrative Pain Management (DVCIPM) was designated as a Defense Center of Excellence in April, 2011, though it has organizationally been in existence since the early 2000's. While originally created by the Army primarily to conduct research in the area of pain management, the organization has recently taken on a much larger role involving the standardization and optimization of pain care across all three Services and the VHA. The cultural change that will be required by all those involved is of such magnitude that a coordinating organization, such as DVCIPM, is required to ensure success. The DVCIPM will provide a central clearing house for federal medicine pain issues affecting the military, VHA, and civilian healthcare systems. While integrating pain management techniques into established federal medicine systems will be challenging, there are a variety of military-VHA-civilian medicine partnerships that can be leveraged to facilitate this needed cultural change within our systems.

No one can dispute the value of effective pain management to the warrior or the warrior in transition. War historically has been a catalyst for the advancement of medical

knowledge and practice, and this has certainly been the case with the current conflicts and the changes made in managing wounded warrior pain. These medical advances now need to be extended throughout the care continuum in a more timely manner. While the DoD and VHA share a history of collaboration on pain management, ongoing partnership in the areas of research, education and clinical pain management must continue to ensure that the gains already recognized in these areas are sustained and enhanced.

The DVCIPM is involved in a number of projects in collaboration with the Services, the VHA, and other external organizations that will assist DoD in developing a more effective comprehensive pain management strategy for the long term. The DVCIPM is now effectively collaborating with the PMWG to ensure that a coordinated, comprehensive program is developed and implemented across the DoD and VHA. The DVCIPM has sponsored or has been involved in the following projects and programs during the past year:

- Continuation of the VA/DoD Regional Anesthesia Military Battlefield Pain Outcomes Study (RAMBPOS) collaborative research project. This is currently the only long term outcomes study looking at both the physical and biopsychosocial aspects of pain in wounded warriors. This study is providing valuable information on the pain experience of wounded warriors and insight into the effectiveness of traditional and novel pain management techniques. This project also represents a template for additional research collaboration between the DoD and VHA that will enhance wounded warrior care throughout the federal healthcare system.

- Launch of the Defense and Veterans Pain Rating Scale (DVPRS) validation study, which will be the first attempt by a major medical system to develop a new pain scale and to standardize the way we measure pain throughout the military care continuum. The Pain Management Task Force (PMTF) report (May 2010) called for a standardized pain assessment tool to provide a common set of pain measurement questions and visual cues (PMTF – 4.1.2). Once the validation study is completed (Fall 2011) the DVPRS will be recommended as the common DoD and VHA pain assessment tool. Pain management has been identified as a key marker of quality healthcare. Standardization of how patients are queried about their pain will provide the DoD and VHA a tremendous advantage in evaluating treatment outcomes and developing effective pain treatment strategies.

- Collaborating with the Joint Improvised Explosive Device Defeat Organization (JIEDDO), the DVCIPM has been integral in collecting the only data on battlefield pain management from the current conflicts, established the first Acute Pain Service at a Level 3 facility in Afghanistan, and launched the first fielding of Combat Support Hospital (Level 3) pain equipment chests in Afghanistan and Iraq.

- In response to the PMTF report (May 2010 – 4.1.9) recommendation for a Pain Assessment and Outcome Registry (PASTOR), DVCIPM launched the Chronic

Pain Impact Network (CPAIN) (PASTOR) demonstration project between Walter Reed National Military Medial Center, Madigan Army Medical Center, and the University of Washington. PASTOR is a patient self-reported, Internet based information system designed to support primary care physicians and pain specialists. Efficient for both patient and provider, the system generates information that can assist the provider in enhancing care by increasing awareness of real or potential pain-related health problems. Questions within the system explore substance abuse issues, mental health, and pain therapy effectiveness to name just a few of the topics addressed by the system. PASTOR will also be the key resource for pain management outcomes data for both the DoD and VHA. PASTOR is also being designed to work with and complement the Patient Centered Medical Home.

- The DVCIPM is responsible for the design and launch of the Joint Regional Anesthesia and Analgesia Tracking System (JRAATS) as a clinical module in the Theater Medical Data Store (TMDS). This system allows clinical tracking of wounded warriors treated with advanced pain management technologies throughout the continuum of care. It also allows pain management providers at all levels of the evacuation chain to communicate key aspects of a wounded warriors' pain management. This system provides the essential communication link that is vital for the safe application of advanced pain care modalities within our current evacuation system.

## APPENDIX

PUBLICATIONS ON PAIN BY DOD AUTHORS

1. **"Double-blinded, Placebo-controlled, Prospective Randomized Trial Evaluating the Efficacy of Paravertebral Block with and without Continuous Paravertebral Block Analgesia in Outpatient Breast Cancer Surgery"**
Chester C. Buckenmaier III, MD; Kyung H. Kwon, RN; Robin Howard, MA; Geselle McKnight, CRNA, MSN; Craig Shriver, MD; William Fritz, MD; Gerard Garguilo, MD; Kristin Joltes, PA-C; and Alexander Stojadinovic, MD.
*Pain Medicine* May 2010; 11(5): 790–799

2. **"Neck Pain During Combat Operations: An Epidemiological Study Analyzing Clinical and Prognostic Factors"**
Steven Cohen, MD; Shruti Kapoor, MD, MPH; Cuong Nguyen, MD; Victoria Anderson-Barnes, BA; Charlie Brown, MD; Dominique Schiffer, MD; Ali Turabi, MD; and Anthony Plunkett, MD.
*Spine* April 2010; 35(7): 758-63

3. **"Serum Ropivacaine Concentrations and Systemic Local Anesthetic Toxicity in Trauma Patients Receiving Long-Term Continuous Peripheral Nerve Block Catheters"**
Lisa L. Bleckner, MD, Saiid Bina, PhD, Kyung H. Kwon, CRNP, Geselle McKnight, CRNA, MSN, Anthony Dragovich, MD, and Chester C. Buckenmaier, III, MD
*Anesthesia & Analgesia* Feb 2010; 110(2): 630-634

4. **"Pain Following Battlefield Injury and Evacuation: A Survey of 110 Casualties from the Wars in Iraq and Afghanistan"**
Chester C. Buckenmaier III, MD; Christine Rupprecht, RN, MSN; Geselle McKnight, CRNA, MSN; Brian McMillan, DO; Ron White, MD; Rollin M. Gallagher, MD, MPH; and Rosemary Polomano, PhD, RN
*Pain Medicine* Nov 2009; 10(8): 1487-1496

5. **"Advanced Regional Anesthesia Morbidity and Mortality Grading System: Regional Anesthesia Outcomes Reporting (ROAR)"**
Chester C. Buckenmaier III, MD, Scott M. Croll, MD, Cynthia H. Shields, MD, Sean M. Shockey, MD, Lisa L. Bleckner, MD, Greg Malone, MD, Anthony Plunkett, MD, Geselle M. McKnight, CRNA, Kyung H. Kwon, RN, Richard Joltes, BA, and Alexander Stojadinovic, MD
*Pain Medicine* Sept 2009; 10(6): 1115–22

6. **"A Unique Presentation of Complex Regional Pain Syndrome Type I Treated with a Continuous Sciatic Peripheral Nerve Block and Parenteral Ketamine Infusion: A Case Report"**

Adam Everett, MD; Brian Mclean, MD; Anthony Plunkett, MD; and Chester C. Buckenmaier III, MD.
*Pain Medicine* Sept 2009; 10(6): 1136-9

7. **"Loss of Resistance Technique for Paravertebral Nerve Blockade Using the Episure™ Autodetect™ Syringe – A Case Report"**
Adam Everett, MD; Brian Mclean, MD; Anthony Plunkett, MD; and Chester C. Buckenmaier III, MD.
*Pain Medicine* Sept 2009; 10(6): 1136-9

8. **"Quality of Reporting of Regional Anesthesia Outcomes in the Literature"**
Alexander Stojadinovic, MD; Sean Shockey, MD; Scott Croll, MD; and Chester C. Buckenmaier III, MD.
*Pain Medicine* Sept 2009; 10(6): 1123-31

9. **"Standard versus pH-adjusted and Lidocaine Supplemented Radiocolloid for Patients Undergoing Sentinel-lymph-node Mapping and Biopsy for Early Breast Cancer (PASSION-P trial): A Double-blind, Randomized Controlled Trial"**
Alexander Stojadinovic, George E Peoples, Jennifer S Jurgens, Robin S Howard, Brandi Schuyler, Kyung H Kwon, Leonard R Henry, Craig D Shriver, Chester C Buckenmaier.
*Lancet Oncology* Sep 2009; 10(9): 849-54

10. **"Opioid-Free Balanced Anesthesia for Cervical Ganglionectomy Subsequent to Recent Ultra Rapid Opioid Detoxification"**
Anthony Plunkett, MD; Michael Fahlgren, MD; Brian Mclean, MD; and Derick Mundey, DO.
*Pain Medicine* May-Jun 2009; 10(4): 767-70

11. **"An Intravenous Ketamine Test as a Predictive Response Tool in Opioid-Exposed Patients with Persistent Pain"**
Steven Cohen, MD; Shuxing Wang, MD, PhD; Lucy Chen, MD; Connie Kurihara, RN; Geselle McKnight, CRNA; Matthew Marcuson, MD; and Jianren Mao, MD, PhD.
*Journal of Pain and Symptom Management* April 2009; 37(4): 698-708

12. **"Awake Thyroidectomy under Local Anesthesia and Dexmedetomidine Infusion"**
Anthony Plunkett, MD; Cynthia Shields, MD; Alexander Stojadinovic, MD; and Chester C. Buckenmaier III, MD.
*Military Medicine* Jan 2009; 174(1): 100-2

13. **"Inadvertant Disk Injection During Transforaminal Epidural Steroid Injection: Steps for Prevention and Management"**
Steven Cohen, MD; David Maine, MD; Sean Shockey, MD; Sapna Kudchadkar, MD; and Scott Griffith, MD.
*Pain Medicine* September 2008; 9(6): 688-694

14. "**Randomized Placebo-controlled Study Evaluating Lateral Branch Radiofrequency Denervation for Sacroiliac Joint Pain**"
Steven Cohen, MD; Robert Hurley, MD, PhD; Chester Buckenmaier, MD; Connie Kurihara, RN; Benny Morlando, RN and Anthony Dragovich, MD.
*Anesthesiology* Aug 2008; 109(2): 279-288

15. "**The Functional Impact on Voice of Sternothyroid Muscle Division During Thyroidectomy**"
Leonard Henry, MD; Nancy P. Solomon, PhD CCC-SLP; Robin Howard, MA; Joyce Gurevich-Uvena, MA CCC-SLP; Leah Horst, MA CCC-SLP; George Coppit, MD, et al.
*Annals of Surgical Oncology* July 2008; 15(7): 2027-33

16. "**Lumbar Zygapopysial (facet) Joint Radiofrequency Denervation Success As A Function of Pain Relief During Diagnostic Medical Branch Blocks: A Multicenter Analysis**"
Steven Cohen, MD; Milan Stojadinovic, MD; Matthews Crooks, MD; Peter Kim, MD; Rolf Schmidt, MD; Cynthia Shields, MD; Scott Croll, MD; and Robert Hurley, MD, PhD.
*The Spine Journal* May-Jun 2008; 8(3): 498-504

17. "**Pain Management of Combat Wounded in the Aeromedical Evacuation Environment**"
Gregory Malone, MD.
*American Society of Anesthesiologists Newsletter* March 2008; 72(3): 15-26

18. "**Factors Predicting Success and Failure for Cervical Facet Radiofrequency Denervation: A Multi-center Analysis**"
Steven Cohen, MD; Zahid Bajwa, MD; Jan Kraemer, MD; Anthony Dragovich, MD; Kayode Williams, MD; Joshua Stream, BS; Anthony Sireci, BS; Geselle MckNight, CRNA; and Robert Hurley, MD, PhD.
*Regional Anesthesia & Pain Medicine* November-December 2007; 32(6): 495-503

19. "**A Double-blind, Placebo-controlled, Dose-Response Pilot Study Evaluating Intradical Etancercept in Patients with Chronic Discogenic Low Back Pain or Lumbosacral Radiculopathy**"
Steven Cohen, MD; Daniel Wenzell, MD; Robert Hurtley, MD, PhD; Connie Kurihara, RN; Chester Buckenmaier, MD; Scott Griffith, MD; Thomas Larkin, MD; Erik Dahl, MD; and Bennie Morlando, RN.
*Anesthesiology* July 2007; 107(1): 99-105

20. "**Pain and Combat Injuries in Soldiers Returning from Operations Enduring Freedom and Iraqi Freedom: Implication for Research and Practice**"
Michael E Clark, PhD; Matthew J Bair, MD, MS; Chester C Buckenmaier, III, MD; Ronald J Gironda, PhD; Robyn L Walker, PhD.
*Journal of Rehabilitation Research & Development* May 2007; 44(2): 179-193

21. **"Intrathecal Analgesia"**
Steven Cohen, MD and Anthony Dragovich, MD.
*The Medical Clinics of North America* 2007; 91(2): 251-270

22. **"Responding to Challenges in Modern Combat Casualty Care: Innovative Use of Advanced Regional Anesthesia"**
Alexander Stojadinovic, MD; Alyson Auton, BA; George Peoples, MD; Geselle McKnight, CRNA; Cynthia Shields, MD; Scott Croll, MD; Lisa Bleckner, MD; James Winkley, MD; Mary Maniscalco-Theberge, MD and Chester C Buckenmaier III, MD.
*Pain Medicine* November 2006; 7(4): 330-338

23. **"Early, Continuous, and Restorative Pain Management in Injured Soldiers: The Challenge Ahead"**
Rollin Gallagher, MD, MPH and Rosemary Polomano, PhD, RN.
*Pain Medicine* November 2006; 7(4): 284-286

24. **"Supraclavicular Continuous Peripheral Nerve Block in a Wounded Soldier: When Ultrasound is the Only Option"**
Anthony Plunkett, MD; D.S. Brown, J.M. Rogers, ; and Chester C. Buckenmaier III, MD.
*British Journal of Anaesthesia* August 2006; 97(5): 715-717

25. **"The Analgesic Effects of Perioperative Gabapentin of Postoperative Pain: A Meta-Analysis"**
Robert Hurley MD, PhD; Steve Cohen, MD; Kayode Williams, MD; Andrew Rowlingson, BA; and Christopher Wu, MD.
*Regional Anesthesia & Pain Medicine* May-June 2006; 31(3): 237-247

26. **"Continuous Peripheral Nerve Block Catheter Tip Adhesion in a Rat Model"**
Chester C. Buckenmaier III, MD; A. A. Auton, BA, W.S. Flournoy, DVM.
*Acta Anaesthesiologica Scandinavica* 2006; 50(6): 694-698

27. **"Continuous Peripheral Nerve Block for Battlefield Anesthesia and Evacuation"**
Chester C. Buckenmaier III, MD; Geselle McKnight, CRNA; James Winkley, MD; Lisa L. Bleckner, MD; Clarence Shannon, MD; Stephen Klein, MD; Robert Lyons, MD; and John Chiles, MD.
*Regional Anesthesia & Pain Medicine* March 2005; 30(2): 202-205

28. **"Anaesthetic Agents for Advanced Regional Anaesthesia: A North American Perspective"**
Chester C. Buckenmaier III, MD; Lisa L. Bleckner, MD.
*Drugs*, 2005; 65(6): 745-759

29. **"Regional Anesthesia in Austere Environments"**
Chester C. Buckenmaier III, MD. Evan Lee, MD; Cynthia Shields, MD; John Sampson, MD; and John Chiles, MD.
*Regional Anesthesia & Pain Medicine* July-August 2003; 28(4): 321-327

**Accepted for Publication**

1. **"Effects of IV Ketamine on Peripheral and Central Pain from Major Limb Injuries Sustained in Combat."**
Rosemary C. Polomano, PhD, RN; Chester Buckenmaier III, MD; Nancy H. Kwon, MSN, CRNP; Cynthia Goldberg; Hanlon H, and Rollin M. Gallagher, MD, MPH.
*Pain Medicine* 2011

2. **"Waging War on Pain: New Strategies to Improve Pain Care for Military and VA Personnel."**
Chester C. Buckenmaier III, MD; Rollin M. Gallagher, MD, MPH; Christine M. Rupprecht, RN, MSN; Spevak C, Mackey S, Edwards H, Houston J, Griffith S, Clark M, Connie Kurihara; Jankovich E, Cahana A, Davis S.
*The Federal Practitioner* 2011 May

3. **"Acute Pain on and off the Battlefield: What We Do, What We Know, and Future Directions."**
Michael Kent, MD; Justin Upp, MD; Chester C. Buckenmaier III, MD.
*International Anesthesiology Clinics*

4. **"Continuous Transversus Abdominis Plane (TAP) Block Catheters in a Combat Surgical Environment"**
Edward Allcock, MD; Eliot Spencer, CRNA; R. Frazer, MD; Gregory Applegate, DO; and Chester C. Buckenmaier III, MD.
*Pain Medicine* September 2010; 11(9): 1426-9