



**The 3rd Annual Trauma Spectrum Conference:  
Emerging Research on Polytrauma, Recovery and Reintegration  
for Service Members, Veterans and their Families**

**Conference Proceedings**

7-8, December 2010  
Bethesda, Maryland

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The Trauma Spectrum Conference, "Emerging Research on Polytrauma, Recovery and Reintegration, for Service Members, Veterans, and their Families," took place on 7 and 8, December, 2010 at the National Institutes of Health (NIH) in Bethesda, Maryland. The conference's mission was to enhance and promote continued collaboration among the Department of Defense (DoD), NIH, Department of Veterans Affairs (VA) and key stakeholders, such as researchers, academics, other federal partners and military and civilian personnel dedicated to improving the lives of service members, veterans and their families. The conference proceedings are a review of each presentation that was delivered during the two days, focusing on the following topics:

- Emerging research for traumatic brain injury, psychological health conditions, vision, eye, hearing, extremity and amputee injuries
- Emerging treatments in support of polytrauma recovery and reintegration needs of caregivers and families dealing with polytrauma patients
- Health, psychological, gender, cultural, geographical and other disparities that impact diagnosis, care, treatment and recovery concerns around polytrauma

## DISCLAIMER

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## ACRONYMS

AE	Aeromedical Evacuation
AFTH	Air Force Theater Hospital
ANG	Air National Guard
ARNG	Army National Guard
AUD	Alcohol Use Disorders
B2B	Buddy 2 Buddy Program
BMS	Burn Model Systems Data
BAMC	Brooke Army Medical Center
BOP	Blast Overpressure
BRAC	Base Realignment and Closure
BSHS	Health Related Quality of Life Scale
C2C	Combat to College
CCATT	Critical Care Air Transport Team
CIT	Crisis Intervention Teams
CPHE	The Center for Post-deployment Health and Education
CSH	Combat Surgical Hospital
CTE	Chronic Traumatic Encephalopathy
CWT	Compensated Work Therapy
DARPA	Defense Advanced Research Projects Agency
DMHAS	Department of Mental Health and Addiction Services
DoD	Department of Defense
DTM	Directive Type Memorandum
DVBIC	Defense and Veterans Brain Injury Center
EACE	Traumatic Extremity Injuries and Amputation Center of Excellence
ERPs	Event Related Potentials
FACES	Family and Caregiver Experience Survey
FACES II	Family Adaptability and Cohesion Evaluation Scale, Version II
FAM-III	Family Assessment Measure, Version III
HCE	Hearing Center of Excellence
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act
HRSA	Health Resources and Services Administration
HRSA MCHB	Health Resources and Services Administration Maternal and Child Health Bureau
IC	Integrated Care
IED	Improvised Explosive Device
IOM	Institute of Medicine
JTTS	Joint Theater Trauma System
LPMC	Landstuhl Regional Medical Center
MASH	Mobile Army Surgical Hospital
MC&FP	Military Community and Family Policy
MH	Mental Health
MMFI	The Military Family Research Institute
MRC	Massachusetts Rehabilitation Commission
mTBI	Mild Traumatic Brain Injury
NEC	New England Collaborative
NIH	National Institutes of Health

# Acronyms



NINR	National Institute of Nursing Research
NNMC	National Naval Medical Center
ODEP	The Office of Disability Employment Policy
OEF	Operation Enduring Freedom
OIF	Operation Iraqi Freedom
PCC	Patient Centered Care
PCS	Post Concussive Symptoms
PDHRA	Post Deployment Health Re-Assessments
PE	Pulmonary Emboli
PH	Psychological Health
PMD	Post-deployment Multi-symptom Disorder
PRC	Polytrauma Rehabilitation Center
PT	Polytraumatic
PTSD	Post Traumatic Stress Disorder
R/NG	Reserve/National Guard
RC	Reserve Component
RCT	Randomized Controlled Trial
RINGS	The Readiness and Resilience in National Guard Soldiers
SAFE	The Support and Family Education Program
SAMHSA	Substance Abuse and Mental Health Services Administration
SCI	Spinal Cord Injury
SCIMS	Spinal Cord Injury Model Systems of Care
SEM	Structural Equation Modeling
SUD	Substance Use Disorder
SWAP	Satisfaction with Appearance Scale
TAA	The Transition Assistance Advisor Program
TAP	Trauma Assessment Pathway
TARGET	Trauma Affect Regulation: Guide for Education and Therapy
TBI	Traumatic Brain Injury
UC	Usual Care
USAFR	United States Air Force Reserve
USAR	United States Army Reserve
USMCR	United States Marine Corps Reserve
USNR	United States Navy Reserve
VA	Department of Veterans Affairs
VAMC	Veteran's Affairs Medical Center
VCE	Vision Center of Excellence
VJO	Veterans Justice Outreach Specialist
WRAMC	Walter Reed Army Medical Center
YRP	Yellow Ribbon Program



## SPONSORING ORGANIZATIONS

### DEFENSE CENTERS OF EXCELLENCE FOR PSYCHOLOGICAL HEALTH AND TRAUMATIC BRAIN INJURY (DCoE)



In November 2007, Deputy Secretary of Defense, Gordon England announced the opening of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury. DCoE leads a collaborative effort toward optimizing psychological health and traumatic brain injury treatment for the Department of Defense (DoD). Partnering with the Department of Veterans Affairs (VA) and an extensive network of collaborators, DCoE supports a holistic approach committed to the establishment of best practices and quality standards for leadership intervention; comprehensive outreach (service member, family, unit and community); education and training; resilience and prevention; clinical care; telehealth connectivity; program excellence; and relevant research. It is responsible for leading and orchestrating a national collaborative network of military, federal, family and community leaders, advocacy groups, clinical experts and academic institutions to best serve the urgent and enduring needs of warriors and their families with psychological health and/or traumatic brain injury concerns.

### NATIONAL INSTITUTES OF HEALTH (NIH)



The National Institutes of Health, a part of the U.S. Department of Health and Human Services, is the primary federal agency for conducting and supporting medical research. Helping to lead the way toward important medical discoveries that improve people's health and save lives, NIH scientists investigate ways to prevent disease, as well as the causes, treatments and cures for common and rare diseases. Composed of 27 Institutes and Centers, the NIH provides leadership and financial support to researchers in every state and throughout the world. For over a century, NIH has played an important role in improving the health of the Nation. NIH is the steward of medical and behavioral research for the nation. Its mission is science in pursuit of fundamental knowledge about the nature and behavior of living systems and the application of that knowledge to extend healthy life and reduce the burdens of illness and disability.

### DEPARTMENT OF VETERANS AFFAIRS (VA)



The Department of Veterans Affairs was established on March 15, 1989, succeeding the Veterans Administration. It is responsible for providing federal benefits to veterans and their families. The VA is the second largest of the 15 Cabinet departments and operates nationwide programs for health care, financial assistance and burial benefits. About a quarter of the nation's population, approximately 74.5 million people, are potentially eligible for VA benefits and services because they are veterans, family members or survivors of veterans. The VA's fiscal year 2007 spending was over \$80 billion, including \$34.9 billion for health care and \$41.5 billion for benefits.

Perhaps the most visible of all VA benefits and services is health care. From 54 hospitals in 1930, the VA's health care system includes 155 medical centers, with at least one in each state, Puerto Rico, and the District of Columbia. VA operates more than 1,400 sites of care, including 872 ambulatory care and community-based outpatient clinics, 135 nursing homes, 45 residential rehabilitation treatment programs, 209 Veterans Centers, and 108 comprehensive home-care programs. Providing a broad spectrum of medical, surgical and rehabilitative care, the VA has experienced unprecedented growth in the medical system workload. Over the past few years, the number of patients treated increased by 29 percent from 4.2 million in 2001 to nearly 5.5 million in 2007.



## THE 3RD ANNUAL TRAUMA SPECTRUM CONFERENCE: Emerging Research on Polytrauma, Recovery and Reintegration for Service Members, Veterans and their Families

### DEFENSE CENTERS OF EXCELLENCE FOR PSYCHOLOGICAL HEALTH AND TRAUMATIC BRAIN INJURY

7-8, DECEMBER 2010

#### EXECUTIVE SUMMARY

The Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury (DCoE), the National Institutes of Health (NIH), and the U.S. Department of Veterans Affairs (VA) hosted the 3rd Annual Trauma Spectrum Conference in Bethesda, Maryland. Over 400 service members, family members, behavioral health professionals and researchers attended the conference, held at the Natcher Auditorium on the NIH campus.

The Trauma Spectrum Conference promoted and enhanced continued collaboration among the Department of Defense, National Institutes of Health, Department of Veterans Affairs, and key stakeholders (e.g., researchers, academics, federal partners, military and civilian personnel) dedicated to improving the lives of service members, veterans and their families. Using the lens of emerging research on polytrauma and its impact on service members, veterans and their families the conference:

- a. Discussed emerging research on traumatic brain injury, psychological health, vision and eye injuries, hearing injuries, extremity injuries and amputations
- b. Presented emerging treatments in support of polytrauma recovery and reintegration
- c. Informed practice regarding the needs of caregivers and families caring for a loved one who has sustained a polytrauma injury
- d. Addressed health, psychosocial, gender, cultural, geographic and other disparities that may impact diagnosis, care, treatment, and recovery concerns around polytrauma
- e. Raised awareness for future development of treatments, practices and policies

Plenary sessions, working lunches and track-focused breakout sessions on acute polytrauma, rehabilitation and reintegration were presented over the course of two days. Highlights included:

- a. Dr. Elaine Peskind provided the keynote address, which included current research on blast injury and post-traumatic stress disorder and information on Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) veterans
- b. Deputy Under Secretary for Defense for Wounded Warrior Care and Transition Policy, John Campbell, spoke about programs and actions that demonstrate the Defense Department's commitment to wounded warriors and those in the Transition Assistance Program
- c. Major (Ret.) Ed Pulido spoke candidly about his experiences with polytrauma, the turning point in his recovery and the current initiatives and programs with which he is involved, including the Folds of Honor Foundation
- d. SAMSHA, the Substance Abuse and Mental Health Services Administration, presented a panel *View From the States: Community-Based Interventions for Veterans*, which focused on state specific initiatives



- e. The Department of Education panel promoted research and evidence-based practice around the area of polytrauma, demonstrating advanced coordination and collaboration across agencies by describing model systems that focus on comorbidities associated with spinal cord injury, burn injury, traumatic brain injury rehabilitation and amputation
- f. A Department of Veterans Affairs panel focused on reintegration challenges among OEF/OIF veterans and their families updated participants about the available research on polytrauma recovery and reintegration
- g. A breakout session dedicated to chronic pain, outlined advances in military medicine, pain management and factors that contribute to individual pain tolerances
- h. Sessions highlighted advances in research and care for service members and veterans struggling with vision, hearing and extremity losses due to injuries experienced during deployment
- i. Presenters identified and presented information on existing programs that can benefit both individuals with polytrauma and their loved ones, such as the New England Collaborative on Traumatic Brain Injury Care, the Yellow Ribbon Reintegration Program, Combat2College and the Sesame Street Workshop
- j. A presentation on "Smart Home," the innovative VA Polytrauma Transitional Rehabilitation Program, was offered to veterans suffering from polytrauma and TBI. Smart Home offers apartment living facilities and cognitive rehabilitation, as well as self instructional strategies through computer monitoring systems to assist patients with their recovery and reintegration into daily life

## DAY 1 PROCEEDINGS

### KEYNOTE ADDRESS

#### RECENT RESEARCH ON BLAST INJURY, PTSD, AND OIF/OEF VETERANS

*Elaine Peskind, M.D., VISN 20 Mental Health Illness Research, Education, and Clinical Center (MIRECC); Friends of Alzheimer's Research Professor, Department of Psychiatry & Behavioral Sciences, University of Washington School of Medicine*

- Approximately 9-18 percent of military personnel return with symptomatic mild traumatic brain injury (mTBI)
- Currently, the controversy lies within etiology, course and treatment of persistent somatic, cognitive and behavioral symptoms in OIF/OEF veterans following mTBI



Elaine Peskind, M.D.

Since 2010, two million soldiers and Marines have been deployed to Iraq and Afghanistan, with nearly 800,000 of these service members deploying more than once. Studies show that approximately 9-18 percent of these military personnel return with symptomatic mTBI. Current

wars in Iraq and Afghanistan differ from previous U.S. conflicts in a variety of ways, but most importantly, improvised explosive devices (IEDs) are the weapons of choice of insurgents in direct fire attacks. Those soldiers and Marines escaping immediate harm may have been exposed to hazardous blast overpressure (BOP) events roughly once every three days for the duration of their 12-month deployment. Most BOP injuries can be understood in terms of pressure and impulse. There is growing concern that repetitive concussive and sub-concussive head injuries can set in motion pathogenic processes that later emerge as neurodegenerative dementing disorders. Repetitive concussions are associated with increased risk of the rare mid-life dementing disorder, chronic traumatic encephalopathy (CTE), while traumatic brain injury (TBI) is currently the best characterized environmental risk factor for developing the common late-life dementing disorder, Alzheimer's disease. For many observed, some of the early brain changes normally visible in patients diagnosed with Alzheimer's disease have been noted in military service members. All of these service members are younger than the patients diagnosed with Alzheimer's disease.

Currently, the controversy lies within etiology, course and treatment of persistent somatic, cognitive and behavioral symptoms in OIF/OEF veterans following mTBI. An epidemiological study in military personnel found that symptoms of chronic mTBI (except for headache) are more correlated with post-traumatic stress disorder (PTSD) and depression. However, many skilled clinicians are convinced that war combatants' chronic symptoms of mTBI reflect real and subtle persistent brain damage. Given this controversy, the question remains, do these chronic symptoms reflect persistent structural or functional brain changes? Participants in the study included: 1) thirty-five male, OIF, veterans with blast-induced mTBI, 2) thirteen, non blast-exposed, OIF veterans, and 3) twelve, cognitively normal community volunteers. Although there was individual variability, there were no group differences between blast and non-blast exposed OIF veterans on aspects such as sentence repetition, paragraph recall and controlled word association.

Overall, there is a need for more data, analysis and replication in studying blast-exposed OIF veterans and non-blast-exposed OIF veterans. Researchers must be careful about the selection of control groups; it is a requirement to have multiple control groups to determine what is specifically blast-related. These control

groups should include mTBI without PTSD, PTSD without mTBI, aged-matched community controls and repetitive sports-related concussion.

*Note: Dr. Peskind's findings are based on preliminary research*

## SESSION I: ACUTE BREAKOUT SESSION

### MEDICAL CARE IN THEATER

*Kristin Silvia, M.D., USAF, MC, Deputy Medical Director, Emergency Department, 779th Medical Group, Andrews Air Force Base, Maryland.*

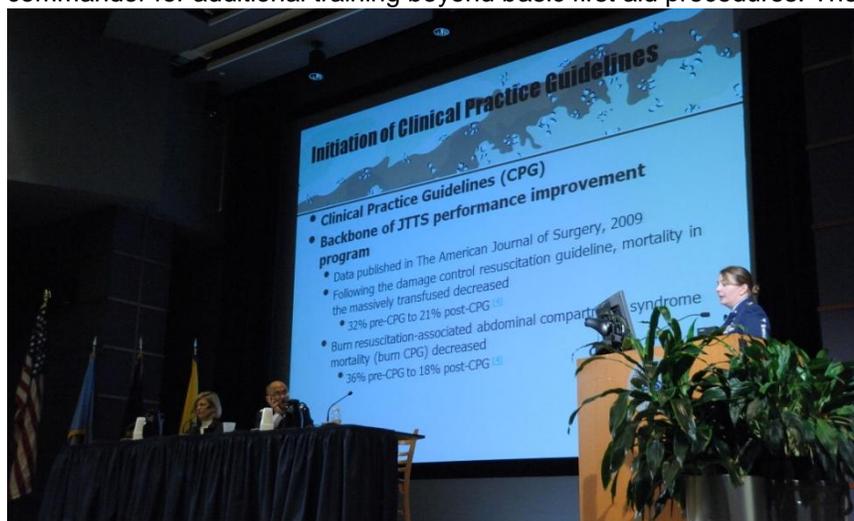
- Penetrating trauma includes improvised explosive devices (IEDs), blasts, landmines and fragments, accounting for 68 percent of combat injuries
- Combat medical care comes in stages on a continuum, from point-of-injury care on the battlefield by medic to VA and rehab care

Military members are sustaining multiple severe injuries as a result of explosions and blasts. Penetrating trauma includes IEDs, blasts, landmines and fragments, accounting for 68 percent of combat injuries. There is a high incidence of survival with polytrauma, which is a sign of advancement in medical care. In previous conflicts, severely injured service members would not have survived.

There are five echelons of care throughout the time of injury on the battlefield to landing stateside for advanced care. These echelons include:

- Level I: Battlefield to battalion aid station
- Level II: Forward surgical team; replaced the mobile Army surgical hospital (MASH)
- Level III: Combat support hospital (CSH), Air Force theater hospital (AFTH)
- Level IV: Landstuhl Regional Medical Center (LRMC)
- Level V: Stateside – Walter Reed Army Medical Center (WRAMC), National Naval Medical Center (NNMC), and Brooke Army Medical Center (BAMC)

With up to 70 percent of combat fatalities occurring in the first five minutes of injury, level I is an immediate life saving measure that is focused on stabilizing and evacuating to the next echelon of care. On the battlefield, each soldier is trained to be proficient in a variety of specific, first-aid procedures. A member of a non-medical unit is selected by the commander for additional training beyond basic first aid procedures. The battalion aid station is an organic component of the unit that it supports and includes combat medics, who conduct sick call when time permits. Level II is a highly mobile, austere surgical team that provides life- and limb-saving surgical care. There are limited capabilities, including no x-ray, lab or subspecialties. After facilitation through level II, the patient is then forwarded to the level III echelon.



**Kristin Silvia, M.D., USAF**



Typical level I trauma centers stateside have approximately 2,000 admissions a year with many different kinds of trauma. In the United States, 11 percent of wounds are penetrating traumas; while in Iraq 68 percent of wounds are penetrating traumas. Military medicine can now save up to 98 percent of those who reach level III. The Joint Theater Trauma System (JTTS) is an organized approach to providing improved trauma care across a continuum of care, especially in the battlefield environment. The vision of JTTS is that every military member injured in the theater of operations has the optimal chance for survival and maximal potential for functional recovery. Data input into the JTTS registry captures mechanism, acute physiology, diagnostic, therapeutic and outcome data on injured patients admitted to deployed United States military treatment facilities.

In conclusion, combat medical care comes in stages on a continuum, from point-of-injury care on the battlefield by medic to VA and rehab care.

## MANAGEMENT OF SERIOUSLY WOUNDED PATIENTS DURING TRANSPORT

*Major Napoleon Roux, M.D., USAF, MC, Chief of Anesthesia, Critical Care Air Transport Team, 779th Medical Group, Andrews Air Force Base, MD*

- The Air Force's critical care air transport teams provide high-quality medical care for injured service members from the battlefield to the hospital, during airborne transportation
- Their mission is to be an "ICU in the sky" - a life-saving aerial emergency room for the most severe injuries, such as head and neck injuries
- These teams are comprised of specialty doctors, nurses and therapists, capable of treating up to six patients for 72 hours per team



**Major Napoleon Roux, M.D., USAF**

One of the most challenging components to treating battlefield wounds is transportation:

getting a service member to a medical treatment facility quickly, often requiring extraction from a dangerous location, such as an area of operations or the scene of a natural disaster. Since the most critical wounds sustained by service members rarely can be treated on-site, transporting those service members to the best facility possible within the short window of opportunity is a daunting task requiring much planning, training and expertise.

The United States Air Force rises to this challenge with its critical care air transport team (CCATT) mission. The CCATTs assist in carrying out the mission of the aeromedical evacuation (AE) system, which is the air transport of patients under medical supervision while delivering optimal care. These CCATTs care for the critically ill and injured patients who require advanced care during transport to the next level of care, typically a level III or above hospital. The staff composition of a CCATT is a physician trained in either emergency medicine, anesthesiology, cardiology or pulmonary medicine as well as a critical care nurse and respiratory therapist.

The CCATT prepares a patient at the staging location for the AE system. They will accompany the patient in-flight and monitor and intervene as necessary. The CCATTs do not routinely provide stabilization, nor do they replace a forward surgical or medical team. They are designed to care for the most critical patients, with a limit of three, high acuity patients or six low acuity patients for up to 72 hours. The injuries sustained in the current operating environment include head, spine, intrathoracic, intrabdominal, burn and amputee injuries. Given the large percentage of head injuries, the goals of the CCATT are to not only reduce mortality due to

TBI, but also to prevent secondary brain injury, such as hypoxia (oxygen deprivation) or intracranial hypertension.

Overall, the goal of the Air Force's CCATT mission is to maintain the same level of care airborne as there is on the ground - to be an intensive-care unit in the sky. The personnel assigned to this mission understand and adjust for in-flight stressors. In addition to their specialty work and continuous education, the teams complete four weeks of rigorous training at Wright-Patterson Air Force Base and the University of Cincinnati. This complicated mission leads to better care and a lower morbidity and mortality rates for service members.

## COMBAT STRESSORS AND PTSD IN DEPLOYED MILITARY HEALTH CARE PROFESSIONALS

*Susanne Gibbons, Ph.D., C-ANP, C-GNP, Assistant Professor, Uniformed Services University of the Health Services and Graduate School*

- Military health care professionals have unique burdens of service during deployments, such as constant proximity to casualties
- These burdens can lead to PTSD and other psychological problems
- Studying the health needs of health care providers demands a uniquely designed study to understand their professional challenges and impact on their psychological health

The contemporary operating environment, involving two wars requiring regular deployments of both the active duty force and the reserve components, has given rise to severe, combat stress problems and PTSD. Extensive studies have examined PTSD in deployed service members, but there is little knowledge of the impact of these deployments on the health care providers themselves. A recent integrative review of the literature aimed to uncover the experiences and exposures of military health care providers deployed to combat and terrorist regions, describing the incidences of PTSD symptoms and related problems in this subset of the force.

There are many variables that affect the likelihood of suffering from post-traumatic stress symptoms, danger to self and/or others during deployment, exhaustion from long working hours, and care of young, severely wounded casualties are among the most common. Factors that protect health care providers from deployment and combat stress include social support of friends and co-workers, maintaining a positive mental state through work and a sense of purpose. Caring friends and a sense that others are willing to pitch in, give many military health care providers the "resilience" to deflect stresses of their situations. Protective factors, those likely to mitigate PTSD in these health care providers include: support of friends and co-workers, coping strategies, such as commitment to their patients; diversions and down-time, inner strength and religion and the maturity and preparation level for war. Moral issues surrounding health care roles that involve critical patient decisions and responsibilities further increase the stress experienced by deployed health care providers. Those functioning in health care roles where they are called upon to make critical patient decisions, such as triage or operating room providers, experience the guilt of survivorship.

Multiple studies have indicated that health care providers suffer from psychological problems during and after deployment, similar to other service members. However, their unique roles and burdens in combat zones mean that a systematic approach to studying combat stress and PTSD in deployed health care providers is necessary. Preliminary results from a secondary data analysis indicate that officer level health care providers fare better than enlisted. This is hypothesized as being due to factors such as advanced age, stable finances and social support, such as marriage. Role stress placed on enlisted health care providers can lead many of them to drink, smoke and consume illegal drugs; however, they are also likely to seek counseling to



**Susanne Gibbons, Ph.D.**



cope with the stress. A comprehensive and unique study specifically targeting the deployed health care provider group, accounting for its unique differences, will allow the military to understand and mitigate the concerns of PTSD amongst all health care trades in the armed services. A healthy population of military health care providers will lead to higher-quality care for the entire force, contributing to mission readiness.

## SESSION I: REHABILITATION BREAKOUT SESSION

### SPINAL CORD INJURY CO-MORBIDITIES

*Denise Tate, Ph.D., Professor of Physical Medicine and Rehabilitation, Principal Investigator, Co-Director U-M SCI Model System, University of Michigan Medical School*

- More than 12,000 spinal cord Injury (SCI) incidents per year, and currently, there are 262,000 persons alive with SCI throughout the United States
- There is also a critical connection with SCI depression and pain in polytrauma. Both depression and pain impact rehabilitation and health outcomes, quality of life and suicidal behavior

SCI is a life altering and chronic condition that can affect an individual's independence and sense of self-worth, creating additional health problems. There are more than 12,000 SCI new cases per year, and currently, there are 262,000 persons alive with SCI throughout the United States. It is particularly devastating for those whose self-identities are defined by their physical performance. The National Institute on Disability and Rehabilitation Research (NIDRR) of the U.S. Department of Education funds a network of centers designed to provide comprehensive services for persons with new traumatic injuries and conduct research to improve their quality of life.

The National Spinal Cord Injury Model Systems of Care (SCIMS) Database has been in existence since 1973, capturing approximately 13 percent of all new spinal cord injuries throughout the United States. The SCIMS database coordinates data that is collected by all funded centers. The SCIMS database currently does not collect data on comorbidities, secondary conditions or injuries that are associated with SCI. Some data has been collected during previous cycles of funding.

Medical comorbidities associated with SCI are defined as any medical problem antecedent to the onset of acute SCI; a health condition that develops independently of the primary condition. Injuries resulting from the same traumatic event that caused the spinal cord injury are varied and are documented below:

- TBI
- Non-vertebral fractures
- Severe facial injuries affecting sensory organs
- Major chest injury requiring mechanical ventilation
- Traumatic amputations
- Severe hemorrhaging
- Damage to any internal organ requiring surgery

There are many SCI comorbidities that affect long-term morbidity and mortality. Although life expectancy continues to increase, life expectancy is somewhat below those without SCI. Mortality rates are significantly higher during the first year after injury, with the leading cause of death being pneumonia, septicemia or pulmonary emboli (PE). New studies on SCI comorbidities show disorders of metabolism, leading to obesity, as well as cardiovascular implications and hormonal changes that significantly impact the body composition of someone suffering with SCI. There is also a critical connection with SCI depression and pain in polytrauma. Both depression and pain impact rehabilitation and health outcomes, quality of life and suicidal behavior. Additionally, both impact one's engagement to treatment and motivation to recover and stay healthy after injury.

The process of aging with SCI needs to be studied carefully, as age may affect the development and treatment of comorbidities and secondary conditions acquired after SCI. New models of treatment need to be tested, and treatment for a combined SCI and TBI, for example, needs to address the many skills required for a successful rehabilitation and community reintegration after injuries. These skills include problem solving, attention and concentration. A clear understanding of factors associated with pain and depression can guide the development of multidisciplinary treatments addressing the many facets of polytrauma care.

Overall, polytrauma requires a multi-agency response with multiple avenues for funding and collaborations to promote best care and highest quality of research. Systems of care must collect data on all relevant comorbidities, complications and secondary conditions. Best practice guidelines reflecting the interactive nature of such conditions into treatment are essential to avoid fragmentation and ineffective services.

## COMORBIDITIES IN TRAUMATIC BRAIN INJURY REHABILITATION

*John D. Corrigan, Ph.D., Professor, Department of Physical Medicine and Rehabilitation, The Ohio State University; Director, Ohio Valley Center for Brain Injury Prevention and Rehabilitation*

- TBI normally presents with co-occurring injuries and behavioral health disorders requiring an integrated approach
- Lifelong access to both medical care to treat complications and rehabilitation services will not only prevent long term conditions but will also alleviate future care for affected patients



**John D. Corrigan, Ph.D.**

TBI is a chronic health condition with both persistent and late developing comorbidities. TBI normally presents with co-occurring injuries and behavioral health disorders requiring an integrated approach. As an example, substance use disorders cause negative outcomes after TBI, such as unemployment, criminal activity, depression and overall lower subjective well-being. Studies have also shown that these negative outcomes get worse as time post-discharge increases. Ultimately, both brain injury rehabilitation and substance abuse treatment professionals need to address co-occurring TBI and substance use disorders (SUD).

SUD treatment providers need to know a TBI history is present and consider implications of onset and severity. There are multiple recommendations for substance abuse treatment providers, including plans that incorporate accommodations for neurobehavioral deficits, co-morbid interactions (e.g., depression, anxiety, pain), and formal and/or informal support needed during and after treatment completion. Like SUD, treatment for other behavioral health comorbidities needs to be considered in light of their interaction with the sequela of TBI.

In the first 10 years post-injury, TBI affected patients are twice as likely to die compared to age, gender, and race-similar population rates—on average TBI reduces life expectancy by seven years. After one year, risk for death is increased with older age, greater disability and pre-morbid unemployment. The consequences of TBI persisting or developing six or more months post-injury include seizures, cognitive deficits, depression, suicide, psychosis, premature death and progressive dementia. For example, a study of 530 World War II (WWII) cases of non penetrating TBI with no significant cognitive impairment three months post-injury were diagnosed with a current and lifetime history of major depression 50 years later.

In managing TBI as a chronic health condition, prospective clinical surveillance allows early detection and intervention for health complications. There must be protocols for preventive interventions that target high incidence or high risk complications, as well as protocols for training in self-management aimed at improving



health and well-being. Access to both medical care to treat complications and rehabilitation services will not only prevent long term conditions, but will alleviate future care for affected patients.

There are various consequences of traumatic brain injury emerging or re-emerging late in life. Most consequences have only been studied up to two years post injury; however, further research shows that health implications, such as premature death, Parkinson Disease and cognitive deficits are consequences and disorders that may occur later in life if not treated directly.

## BURN TRAUMA

*James A. Fauerbach, Ph.D., John Hopkins University Burn Injury Model System*

- Severe burn injury and complications impact and limit the health and function of burn survivors, limiting activities in physical, psychological and social domains
- Burn model systems data (BMS) focuses on examining the core features of psychological disorders among burn patients over time and examining patient recovery trajectories over two years

Burn injuries are unique in comparison to other injuries because they cause disfigurement of body image and social adjustment can be affected tremendously. Severe burn injury and complications impact the health and function of burn survivors, limiting activities in physical, psychological and social domains. These reduced abilities affect participation and performance within various roles at home, the workplace, and the community. Functional limitations include concentration and memory, cognitive processing, mood and emotion regulation, and socio-behavioral deficits and excesses, which include avoidance, social isolation, and in many cases, substance abuse.

Burn model systems data focuses on examining the core features of psychological disorders among burn patients over time and examining patient recovery trajectories over two years. Structural equation modeling (SEM) is a method used for theory testing and evaluation of hypothesized factor structure models. Initial analytic projects with BMS data examine core features of an affected patient and how they recover individually. These core features include body image; examining self satisfaction with visible, hidden, social comfort and social reactions. The data examines those with three stress levels, high distress, moderate distress and low distress. Of those studied, 40 percent of identified individuals are getting worse, with others showing mild/moderate improvement over time. The overall lesson learned from these studies is that, if no intervention is taken initially, there is somewhat of a "social death" due to isolation and depression of the patient.

Additional studies, including the SF-36 Health Survey, Quality of Life Measure, looks at how engaged a person may be with their life, and the correlation of the physical burden compared to his or her psychological burden. Of those studied, there is a significantly greater impairment and slower recovery of physical health and function at six and twelve months post-burn, relative to those with smaller burns and relative to published norms. The psychological burden is also correlated with substance abuse and mental health treatment. There is also greater psychological burden within inpatient care. Variables not related with psychological burden include treatment (need for surgery and/or amputation), impaired function and pre-existing conditions that may have occurred prior to the burn injury itself.

In order to alleviate these challenges, developing measures that are directly applicable to this population for these problems is recommended. These recommend measures include: 1) satisfaction with appearance scale (SWAP), 2) health related quality of life scale (BSHS), 3) social stigmatization/exclusion: perceived stigmatization questionnaire, and 4) social adjustment/inclusion (social comfort questionnaire). The Center for Appearance Research and Changing Faces and the ABA/Phoenix Society are just two examples of organizations that are currently looking into these areas of measurement to provide training and assistance.

## SESSION I: REINTEGRATION BREAKOUT SESSION

### THE CHILDREN AND FAMILIES OF COMBAT INJURED SERVICE MEMBERS

*Stephen Cozza, M.D., Associate Director, Center for the Study of Traumatic Stress, Child and Family Programs; Professor of Psychiatry, Uniformed Services University of Health Sciences*

- Among combat injuries, the most common causes of physical injuries are blast/concussive and include musculoskeletal, spinal cord, disfigurement, amputations, burns and impairments
- Three quarters of recently returned married or cohabiting combat veterans reported family problems in the first week of being home

More than 38,000 service members have been injured in Iraq and Afghanistan and more than 30,000 children have been affected by combat injury. Effects on families are likely to be variable, complex and changing over time varying from timing of injury, type or severity of injury, family composition, developmental ages, pre-existing challenges, and post-injury course.



**Stephen Cozza, M.D.**

Among combat injuries, the most common causes of physical injuries are blast/concussive and include musculoskeletal, spinal cord, disfigurement, amputations, burns and impairments. There are also the invisible injuries, such as certain cases of TBI and PTSD, and the development of co-morbid psychiatric conditions. Although research in this area is still evolving, there is an extreme impact of combat exposure on service members, including a high level of traumatic combat exposures (i.e., witnessing injury or death, exposure to dead bodies, hand-to-hand combat and blast injuries), which results in psychiatric sequences and other morbidity (e.g., depression, PTSD, substance use disorders, cognitive disorders, and physical injury).

There are trans-generational effects of PTSD on Vietnam veterans' relationships and families. PTSD affected Vietnam veterans' families experience severe problems in marital and family adjustment, often displaying violent behavior. There are broad relationship problems and difficulties with intimacy correlated with severity of PTSD symptoms. PTSD adversely affects interpersonal relationships, family functioning and dyadic adjustment. Emotional numbing and avoidance components of PTSD are most closely linked to interpersonal impairment in relationships with partners and children. Co-morbid anger and depression in veterans, as well as partner anger, also exacerbate problems in Vietnam veteran families affected by PTSD. Three quarters of recently returned married and/or cohabitating combat veterans reported family problems in the first week of being home. Parental psychiatric illness also impacts negatively on children and can complicate the course of family recovery.

The injury recovery trajectory is not an event; it is a lengthy process. The notification of an injury to a family initiates a cascade of events, which includes communicating the news with children. Children must be informed to the level that they can understand and at the time that is appropriate. Injury communication includes dialogue about the injury and its consequences within and outside of family. Travel and family separations often result post injury notification, which further disrupt children's schedules, living arrangements, school and daycare routines. In addition, preexisting strengths and weaknesses within families, parents, and children likely contribute to outcomes and marital dissolution. Longer term family challenges include a variety of transitions, such as military careers; new neighborhoods; new health care providers and systems of care; and change in parental personality.

There are a variety of rehabilitation opportunities offered to injured service members and their families, which does not just include physical rehabilitation. Recommendations include incorporating children into therapy



activities and developing a “transitional space” for parents and children to experience new interactions. When appropriate, allowing the child to play and become comfortable with prostheses or other equipment is also recommended. Approaching the rehabilitation of an injured family member with full communication, while implementing best practice approaches, will ensure instrumental support and attention to physical and psychological complications.

## **TELEREHABILITATION FOR COMBAT WOUNDED WITH TRAUMATIC BRAIN INJURY AND POST TRAUMATIC STRESS DISORDERS**

*Kris Siddharthan, Ph.D., James A. Haley Veterans Hospital, Tampa, Florida*

- The VA conducted an intervention study in 2008 that evaluated the need for rehabilitation care centers and the efficacy of telerehabilitation,
- Overall, the specialists did not come up with a standard dialogue for treatment because there is not one single approach for treatment with the various types of TBIs

When the war first started, there were many misunderstandings of what the complications might be. Wounded veterans are far different now than in any other war. As the capability to return service members from combat has greatly improved, more are surviving but will have to go through an entire lifetime of treatment. The system is overwhelmed with the type of injury and returning combat veterans. Of the staggering numbers of troops who come back from war in Iraq and Afghanistan, approximately 25,000 had to be air lifted. Those who then needed continued rehabilitation were sent to particular centers; given the need for these care centers, the VA made a decision to set up care coordination programs.

In order to evaluate the need for these care centers and the process of telerehabilitation, the VA set up an intervention study in 2008 to capture the following information:

- Evaluate the efficacy of telerehabilitation
- Monitor physical and Mental Health outcomes
- Determine if cost effective
- Capture patient satisfaction

The study communicated directly with veterans via the internet and assembled a group of specialists who had to communicate at least once a week with their assigned veterans online, both synchronously and asynchronously. However, there were initial challenges due to bureaucracy and Health Insurance Portability and Accountability Act (HIPAA) compliance and firewalls. Overall, the specialists did not come up with a standard dialogue for treatment because there is not one single approach for treatment with the various types of TBIs. In the study, veterans used survey monkey and input every six months. PTSD with TBI appears to create a distinct cohort of veterans (different than those with PTSD alone, which does not cause as much of an issue). Many diagnoses were uncovered in the studies that were initially missed in the traditional VA care. The most predominant finding was the need for a coordination of care, which includes scheduling appointments, pain management, drug therapy, substance abuse (many of those who did not have problems with substance abuse found this as a problem coming back from war), counseling and behavior modification.

Overall, PTSD was found to be a significant predictor in social integration, mobility and physical independence. This in turn affects cognitive functions, communication, and the psychological adjustment of returning home from war. Although physical symptoms may have stabilized, the problem areas of memory, problem-solving, integration into society and suicidal problems remain as major obstacles for wounded combat veterans.

There are individualized pathways that are needed in treating wounded combat veterans. Alcohol and substance abuse complicates treatment and fragmented care delays recovery. Veterans are appreciative of the telerehabilitation program. Within this work, specialists not only have advanced their research in treating



these victims, but also have discovered new ways to treat individual cases moving forward.

## POST DEPLOYMENT HEALTH AND PREVALENCE OF POLYTRAUMA IN FEMALE VETERANS OF OEF/OIF

Sally Haskell, M.D., Associate Professor of Medicine, Yale University School of Medicine; Medical Director Women's Health VISN 1; Senior Consultant, Women Veteran's Health Strategic Health care Group, VA Central Office

- Chronic Pain is more common in women than men in civilian populations and is often associated with PTSD, and with sexual trauma
- Currently, there is a lack of research on gender differences in comorbidity associated with TBI and a lack of knowledge regarding women veterans with TBI

Chronic Pain is more common in women than men in civilian populations and is often associated with PTSD and with sexual trauma. Psychosocial stresses, such as mental illness and lack of social support may exacerbate chronic pain. There are many studies that support the research that women veterans may be at increased risk of chronic pain after deployment. In a recent assessment, veterans were asked to rate their current pain intensity on a scale of zero to 10, where zero is no pain and 10 is the worst pain possible. Below is an outline of the data captured by those veterans who have used the VA within one year of last deployment. Results demonstrate that women captured a higher pain assessment than males one year after deployment in the overall pain assessment and moderate pain levels.

	Female n=18,481	Male n=134,731	Pain value
Pain Assessment	60.1 percent	59.6 percent	0.247
Any pain	38.1 percent	44.0 percent	<0.0001
Moderate pain	68.0 percent	62.6 percent	<0.0001
Persistent pain	18.0 percent	21.2 percent	<0.0001

TBI is often associated with elevated levels of psychiatric distress and neurobehavioral symptoms. Currently, there is a lack of research on gender differences in comorbidity associated with TBI and a lack of knowledge regarding women veterans with TBI. It is important to understand women's health characteristics and needs to inform health services interventions and care centers. Within the percentages of veterans who report "severe" and "very severe" symptoms outlined by gender, there is a predominance of severe pain with women overall. Confirmed mTBI is associated with significant psychiatric and neurobehavioral comorbidities and there are gender differences in these symptoms. Women experience more severe neurobehavioral symptoms and depressive symptoms are particularly common for women.

As for polytrauma, there are a limited number of cases and information regarding gender specific issues. As seen from the graph below, of the cases that are known, polytrauma injuries are prevalent among females especially, within brain injury and PTSD.



Condition	Prevalence
Brain Injury	91 percent
PTSD	50 percent
Vision Loss	32 percent
Orthopedics (fractures)	5 percent
Burns	5 percent
Hearing Loss	27 percent
Anxiety	14 percent

In the first year after deployment, female veterans have higher rates of depression and slightly higher rates of musculoskeletal conditions when compared to male veterans. Women veterans have less pain, but those with pain are more likely to have moderate to severe pain; women veterans with TBI may also have more neurobehavioral symptoms. Overall, there is little data on polytrauma in women and there is a need for further work to understand gender specific problems related to polytrauma within the female gender.

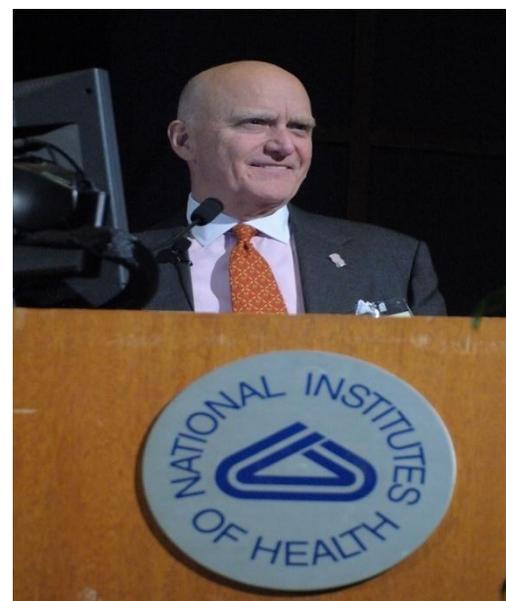
## WORKING LUNCH

### ACTIVE LIVES AFTER POLYTRAUMA

*The Honorable John Campbell, Deputy Under Secretary of Defense for Wounded Warrior Care and Transition Policy*

Within the wounded warrior care and transition policy official, there is intense oversight of the Defense Department programs that are meant to underscore commitment to wounded warriors and those in transition. The three guiding principles are as follows:

- 1) Embrace the Warrior Work Ethic. In the past, many executive leaders were veterans. They understood what it meant to be a veteran, to have combat experience and injuries, both physical and psychological. The environment is much different today where only five percent of CEOs in this country have been in military service. Warriors, wounded or otherwise, have a tremendous uphill battle trying to convince employers that they have what it takes. The work ethic is to do more with less.
- 2) Foster Collaboration. There are major undertakings with sister agencies, including the Departments of Labor and Veterans Affairs and the U.S. Office of Personnel Management. A national jobs portal project that is currently underway amongst multiple agencies will be launched next year, which follows Dr. Stanley's effort to collaborate more with Congress, and to become more familiar with the information that Congress would like us to provide. Establishing public and private partnerships will foster relationships that will provide and support wounded warriors during transitions.



The Honorable John Campbell



- 3) Open and Transparent Communication. Government agencies need to provide information to those who need it, especially service members who have transitioned and are now veterans.

### ACTIVE LIVES AFTER POLYTRAUMA

*Retired U.S. Army Major Ed Pulido, Vice President of Programs and Military Affairs, Folds of Honor Foundation*

Retired U.S. Army Major Ed Pulido spoke candidly about his experiences with polytrauma, the turning point in his recovery and the current initiatives and programs with which he is involved, including the Folds of Honor Foundation. A charitable organization, Folds of Honor empowers deserving military families with educational support and opportunities. These two initiatives support and empower service members and their families across the nation in both healing and providing opportunities for employment and education. In focusing on the bettering of the military community, there is a commitment across three predominant categories, which include employment, partnerships and collaborations, and motivating factors. These motivating factors, which include honor, respect and responsibility of civilians across the nation, are what continue to improve and impact best practices across local communities.



Retired U.S. Army Major Ed Pulido

## SESSION II: ACUTE BREAKOUT

### ACUTE PSYCHOLOGICAL CARE IN THEATER: OPERATION ENDURING FREEDOM COMBAT STRESS CONTROL

*Colonel (Select) Christopher Robinson, USAF, Ph.D., Senior Executive Director, Psychological Health, Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury*

- Combat stress control teams travel to the units experiencing the most fighting to provide immediate psychological help and teach classes to empower service members to deal with problems
- These health care providers ensure that service members can stay in the fight and return home healthier

Psychological care for service members and veterans has become of paramount concern to the Defense Department, Department of Veterans Affairs and top politicians over the last few years, as the psychological consequences of the contemporary operating environment affect those deployed in profound and troubling ways. The highest-ranking uniformed service member, the chairman of the joint Chiefs of Staff, said "How we take care of those who are wounded and their families, and the families of the fallen, is right at the center of my life." Psychological care has become a long-term commitment of not only the medical community, but the leadership of the military as a whole.

These invisible wounds of war, such as PTSD, are some of the most prevalent conditions impacting performance in combat. Of the 1.8 million troops that who have deployed in support of OEF/OIF since 2001,

24 percent of troops have reported that stress has impacted their performance, and 18 percent had evidence of mental health problems. The main determinant of mental health status is the exposure to combat, as well as the length of a deployment; the stress of deployment tends to peak in the eight-10 month range and then begins to decline as the end of a deployment nears. One troubling fact is that only about half of the troops who need psychological health receive it; within the subset of those who seek psychological help, only 42

percent get it, meaning that the military has a lot of work to do to provide adequate amounts of service and to establish a climate where seeking help is deemed positive behavior.

The military has ramped up combat stress control in response to this - it is the first line of defense against psychological health problems in troops. Combat stress control fulfills a role similar to chaplains - they are forward deployed and attached to combat units; focused on keeping service members healthy and in the fight, and provide support to the units closest to combat. These teams employ education, clinical care and stress control techniques to improve the lives of service members. Specific services include: evaluation and treatment of behavioral health disorders; mTBI screenings; consulting commanders; traumatic event management; and briefings and classes on topics, such as anger/stress and relationship enhancement.



**Colonel Christopher Robinson, USAF, Ph.D.**

The many mental health stressors of a combat zone are exacerbated by cultural and operational realities - overuse of nicotine and caffeine, sleep deprivation, privacy and confidentiality concerns, and the easy access to firearms. The health care professionals in the military who comprise combat stress control teams and fulfill these important roles for military units closest to combat serve an essential role: keeping soldiers healthy, keeping engaged units in fighting shape, and ensuring that when service members come home they are mentally fit enough to reacquire themselves to civilian life and their families.

## **MILD TRAUMATIC BRAIN INJURY: LESSONS FROM THE CIVILIAN EXPERIENCE**

*Ramon Diaz-Arrastia, M.D., Ph.D., Department of Neurology, University of Texas Southwestern Medical Center*

- Of the 1.4 million emergency department visits per year in the United States, there are over 80 percent mild cases of TBI and 50,000 fatalities annually
- Effective therapies are likely to be successful across populations, both civilian and military

Traumatic brain injuries are among the earliest described illnesses in human history. Of the of 1.4 million emergency department visits per year in the United States, there are over 80 percent mild cases of TBI and 50,000 fatalities annually. 5.3 million Americans - 2 percent of the U.S. population - live with disabilities resulting from TBI, which is the single most common cause of death and permanent disability in young people under the age of 45, with total costs estimated at \$56.3 billion per year. Within the civilian world of TBI, there are multiple lessons to be learned to enhance research within wounded warriors or service members who return from deployment. New insights from advanced neuroimaging and the diagnosis of management of mTBI in civilians can assist in analyzing military cases throughout the United States, both on the battlefield, and off.

Cranial CT scanning, used with emergency departments, is very useful for assessing the needs for neurosurgical intervention. Post-concussive symptoms and long-term neuropsychological deficits can result in pre-morbid functioning and substance abuse. Caught early, these outcomes and results can be prevented with technology treatments that are used today. Studies of athletes who have sustained injury can offer: 1) the ability to do pre-injury testing in large samples, 2) information regarding the high frequency of concussion, and 3) the ability to perform systematic follow up that can be tracked. However, the disadvantage in using these sports injuries as examples to follow is that the mechanical forces for that injury (tackle, fall, mild concussion, etc.) are generally lower than in motor vehicle or combat settings within the field.



There are also consequences of mTBI within the second injury or impact. If the victim or patient is not yet recovered from the first injury, there is often a delayed recovery of post-concussion symptoms and a great risk of long-term consequences. A recurrent concussion is also a risk for dementia. In a 2001 Health Survey of retired NFL players, participants responded with the following statistics:

- Average number of concussions during professional football career: 2.1
- 24 percent of respondents sustained three or more concussions
- 12 percent of respondents sustained five or more concussions
- 71 percent reported having returned to play on the same day as their concussion (18 percent reported this occurrence three times or more)
- 16 percent reported that concussions have a permanent effect on thinking/ memory skills as they get older

Although the symptom complex is very similar between civilian and military occurrences, the biomechanical details may differ. Prevalence of symptoms may be higher in the military setting, and the severity of injury is likely higher. There is also a higher incidence of repeated mTBI and an increased vulnerability to mTBI in the setting of combat stress. Overall, however, there is a relevance of civilian experience to military TBI and effective therapies are likely to be successful across populations, both civilian and military.

### **ACUTE TRAUMATIC BRAIN INJURY: REVIEW OF MILITARY SYSTEMS OF CARE 2010**

*Colonel Jamie B. Grimes, USA, M.D., National Director, Defense and Veterans Brain Injury Center*

- The military has made a concerted effort to identify and treat service members suffering from TBI, led by institutions such as the Defense Veterans Brain Injury Center (DVBIC) and others in the fight against this complicated and debilitating injury
- Every service member sustaining a concussion or being present during a blast must now be medically evaluated and given a rest period depending on the screening. As well, there are protocols for anyone sustaining two or more TBIs within 12 months. These new policies are outlined in a directive-type memorandum (DTM) and utilize commanders to ensure its effective implementation

TBI has been called one of the signature wounds of the wars in Iraq and Afghanistan, drawing attention to the severity and frequency of the wound. However, this marks major progress over just a few years ago when it was called a "silent epidemic" by the Center for Disease Control in 2007. The military has made a concerted effort to identify and treat service members suffering from TBI, led by institutions such as the Defense Veterans Brain Injury Center (DVBIC) and others in the fight against this complicated and debilitating injury.

The United States military learned the hard way how serious TBI is for its service members: 40 percent of combat fatalities in Vietnam were head and neck injuries; 17 percent of casualties in Desert Shield/Desert Storm were TBI-related. It was in 1991 when the Defense Department initially stood up DVBIC to track and evaluate head injury survivors, ensure appropriate treatment, and study treatment outcomes. But after nearly a decade of increased focus on TBI injuries following the wars in Iraq and Afghanistan, DVBIC has taken on a renewed mission to serve active duty military, dependents, and veterans with TBI, and to ensure state-of-the-art medical care, innovative clinical research and education programs. DVBIC has an office of Surveillance/Force Management and an office of Responsibility for Predeployment Cognitive Testing to assist in this important mission. This is especially important because, due to unique tactics employed by our enemies in Iraq and Afghanistan, these wars possess the largest percentage of TBI victims in any conflict in our nation's history; tactics like the employment of improvised explosive devices contain the double threat of causing a motor vehicle accident, but also the pressure blast accompanying the accident which can cause a TBI.

Currently, 66 percent of service members who are wounded in Iraq are wounded by blast injuries, with 41 percent of them suffering from TBIs. A total of 11.2 percent of all service members in theater met the criteria



for mTBI. An overwhelming majority of those suffering are in the Army, with a sizable portion of the remaining being Marines; the other branches account for about 5 percent of overall cases. These are primarily caused by pressure from an explosion, which can lead to flying debris and body displacement causing further or exacerbated injuries. While the major cause of TBI is the type of weaponry employed by our enemies, the high diagnosis rates could also be attributed to better screening techniques and medical advances that allow patient survival from what might have been a lethal attack in previous wars.

DVBIC and other military health system organizations have implemented new event-driven treatment standards for service members to mitigate consequences of TBIs. Every service member sustaining a concussion or being present during a blast must now be medically evaluated and given a rest period depending on the screening. As well, there are protocols for anyone sustaining two or more TBIs within 12 months. These new policies are outlined in a directive-type memorandum (DTM) and depend upon commanders to ensure its effective implementation. This DTM has identified the "acute" stage of the TBI, the seven days following injury, as essential to long-term mitigation of effects; during this timeframe, health care providers can employ a mix of pharmacological treatment and education, sleep and physical therapy to assist the injured service member.

DVBIC and others are leading the way to developing comprehensive mitigation strategies and treatment efforts for service members suffering from TBIs. Mandatory evaluations and rest periods for those exposed to blasts will go a long way towards early identification and treatment. As one of the signature wounds of the war, many stakeholders will closely scrutinize how the military reacts to TBI; moving forward, this close collaboration between the military health system and troop commanders will lead to better results and a fitter force for the military.

## SESSION II: REHABILITATION BREAKOUT SESSION

### OPTIMIZING PAIN MANAGEMENT FOR OUR WARRIORS AND THEIR FAMILIES

*Colonel Chester Buckenmaier III, USA, M.D, Walter Reed Army Medical Hospital, Defense and Veterans Pain Management Initiative*

- Preoperative inflammation can have long-term consequences for patient health, new studies reveal
- The military has launched task forces to develop comprehensive pain management strategies to account for modern research and the experiences of today's battlefield

With the ongoing wars in Iraq and Afghanistan, the military health system has undergone a transformation to deal with new injuries, such as TBI; but this transformation is also influenced by changes in technology and equipment that allows health care providers to provide new and better forms of care. Developing standardized and effective treatments in these improved areas is essential for the military to deliver consistently effective care to injured service members. Pain management is essential to any combat health care regime, which is why in 2009 the Army Pain Management Task Force Charter was signed to develop a comprehensive pain management strategy that utilizes state of the art modalities and technologies to optimize the quality of life for soldiers with acute and chronic pain.

This task force has delivered four recommendations which will lead to a standardized Defense Department and Department of Veterans Affairs' vision and approach to pain management. The four recommendations are:

- Focus on the warrior and family (sustaining the force)
- Synchronize a culture of pain awareness, education and proactive intervention (medical staff, patients and leaders)
- Provide tools and infrastructure that support and encourage practice and research advancements in pain management

- Build a full spectrum of best practices for the continuum of acute and chronic pain care, based on a foundation of the best available evidence

New research focused on surgical care has major implications for the military's pain management strategy. Conclusions from an *Anesthesia Patient Safety Foundation Workshop* on postoperative long-term outcomes indicated that preoperative inflammation can have long-term effects on mortality, as well as

impact the development of inflammatory diseases, such as cardiovascular disease and cancer. These implications mean that military health care providers, especially surgical units dealing with battlefield traumas, should investigate how inflammation during surgery may affect the long-term health of the service members under their care.



**Colonel Chester Buckenmaier III, USA, M.D.**

One of the most important and difficult duties in the military health care system is to provide emergency and surgical care to injured service members. As we learn more about the long-term consequences and impacts of different medical procedures, health care providers become better equipped to provide effective treatment for the wounded, ill and injured.

The study and task force discussed above are influencing the future of acute and chronic pain management in the military and VA health care systems in ways that will ensure a more fit and ready force, ready to tackle the worldwide security challenges confronting our nation.

## **INDIVIDUAL DIFFERENCES FACTORS ASSOCIATED WITH RISK FOR CHRONIC PAIN**

*Roger B. Fillingim, Ph.D., University of Florida, College of Dentistry, Rehabilitation Outcomes Research Center, North Florida/South Georgia Veterans Health System*

- Pain experience is unique to every individual, with biological and psychological factors influencing how pain will be experienced
- Effective pain management must account for individual differences, so understanding the complexity of the issue will allow health care providers to provide more optimal care

Pain is the number one reason for seeking health care, accounting for more than 70 million physician visits annually. A study from 1995 indicated that the costs of pain management exceed the combined costs of treating AIDS, cancer and heart disease. Unsurprisingly, service members and veterans report high rates of pain, a reflection of the toll that military service can take on the body over time. In a VA primary care setting, half of all patients reported chronic pain; about half of all returning service members from Iraq and Afghanistan report chronic pain when screened, a troubling number given that most of these veterans are under forty years old. More than 80 percent of service members treated in a VA polytrauma rehabilitation center report pain problems. As these numbers demonstrate, the cost - both financial and physical - of chronic pain hit uniformed personnel and veterans especially hard.

Providing quality pain management is a priority of the military health system, yet understanding pain is a complicated business. Many factors influence an individual's susceptibility to pain and their tolerance for pain. Traits such as age, gender, ethnicity and genetics influence pain disposition; less measurable factors such as pain tolerance and psychological traits, also influence pain management. Other factors that affect

pain include an individuals' exposure to trauma or injury, as well as to occupational stress, in addition to an individuals' diet and smoking habits. Gender is a quick predictor of susceptibility to certain chronic pain disorders; females have measurably higher rates of experiencing pain from migraines, tension headaches, rheumatoid arthritis, fibromyalgia and other conditions.

Interestingly, research has demonstrated that conditions such as lower back pain can be influenced by non-physical factors. Cognitive factors, such as attitudes and fear avoidance beliefs, as well as perception of one's own health and depression can all place one at higher risk for lower back pain. Occupational factors, such as job satisfaction, the monotony of one's work and the perceived demands of the workplace all have strong evidence suggesting heightened risk for lower back pain.



**Roger B. Filligim, Ph.D.**

Researchers at the North Florida/South Georgia Veterans Health System developed a model for understanding how individual factors influence their pain experience and management. In this model, genetic factors flow into and influence psychological and biological processes, which in turn create a unique pain processing ability; these all manifest in an individual's chronic pain disorders (or lack thereof). What this model demonstrates is that there are many factors, unique to each individual, influencing pain. Even those experiencing very similar inputs - such as two Soldiers experiencing the same motor vehicle accident or explosion - can have widely different pain outcomes.

Understanding the complexity of pain and pain management will allow the military health system to provide better care for service members and veterans. With a new wave of wounded, ill and injured veterans, it is especially important that the complexity of pain be more thoroughly understood in order to deliver the best possible care to those bearing the physical price of having served in uniform.

## **PAIN MANAGEMENT: PUTTING THE EVIDENCE INTO PRACTICE**

*Stephen T. Wegener, Ph.D., Department of Physical Medicine and Rehabilitation, Johns Hopkins School of Medicine, Department of Health Policy and Management, John Hopkins Bloomberg School of Public Health*

- The health care community is undergoing a paradigm shift of understanding pain management from a biomedical model to a more comprehensive biopsychosocial model
- Utilizing a multi-modal understanding of pain and treatment options, the military health care community has an opportunity to train and teach patients and their families about effective chronic pain management

With a new generation of veterans from the Iraq and Afghanistan wars and the population of Vietnam veterans increasing their consumption of medical care, pain management has become a pressing concern for health care providers seeking to meet the needs of their patients. There is widespread recognition that pain is often mismanaged or managed inadequately both in military and civilian populations; however, due to growing evidence-based understanding of pain, and the transition from acute to chronic pain management, the health care community is closing the gaps on managing pain appropriately for those under its care.

The health care community is undergoing a paradigm shift of understanding pain management from a biomedical model to a more comprehensive biopsychosocial model. The biomedical model links the

underlying disease/injury to pain and functioning. However, the biopsychosocial model accounts for the biological causes (injury, comorbidities, etc) with psychological (cognitions, emotion, coping, behavior) and social/environmental (family, work, health care system) factors in understanding pain and functioning. This biopsychosocial model recognizes pain as a multidimensional experience involving multiple systems; each system is a potential target for intervention.

A unique component of pain management compared to other major forms of health care is that patients and families are the central modes of delivery for pain management in the cases of chronic pain, illness and disability. This work is often unacknowledged, untrained and unpaid; as well, the medical community typically focuses on what a health professional is going to do, not what a family is going to do, meaning that chronic pain management is relatively unexplored given how commonly it is needed. A movement towards patient-centered care (PCC) is underway and will better empower service members and veterans with chronic pain to care for themselves effectively.

Empowering those with chronic pain to effectively treat it is essential to their long-term, comprehensive well-being: those unable to effectively manage their pain will frequently suffer from anxiety, depression and exaggerated levels of pain, and feel helpless and pessimistic about the prospects of the pain resolving. Utilizing a multi-modal understanding of pain and treatment options, the military health care community has an opportunity to train and teach patients and their families about effective chronic pain management. This shift in thinking offers a better future for our service members and veterans, improving understanding and action to raise quality of life.

## SESSION II: REINTEGRATION BREAKOUT SESSION

### SESAME STREET AND HEALING HEROES

*Captain Russell Shilling, USN, Ph.D., Program Manager, Defense Advanced Research Projects Agency (DARPA)*

- In an effort to create innovative programs for service members and their families, the Defense Advanced Research Projects Agency (DARPA), created both the Healing Heroes (HH) Program and Sesame Street Workshop to implement these programs
- Through interactive activities and games, children can begin to problem-solve and persevere through real life challenges and express individual expression and communication

In an effort to create innovative programs for service members and their families, DARPA created both the HH and Sesame Street Workshop. The HH program was developed to apply innovative information technologies to deliver psychological health education, outreach and guidance to war fighters, veterans and their families, while also helping Defense Department improve their psychological health programs, policies and services. In combining social-networks, new media, and informatics techniques to educate and guide users to the best available resources, the department is then able to apply valuable information to improve policy and services. The overall goal of the program is to develop a next generation web portal for outreach, education and support for service members experiencing issues with psychological health and TBI.



**Ms. Debra S. Kamen, M.S.,  
Catherine Bradshaw, Ph.D.,  
Captain Russell Shilling, USN, Ph.D.**



The Sesame Street Workshop (Talk, Listen, Connect) focused on three phases for the children within military families: 1) deployments, 2) injured parents/returning home, and 3) loss of a parent/grief. In providing interactive activities and games, these children can begin to problem-solve and persevere through real life challenges and express individual expression and communication. The program received the Council on International Nontheatrical Events (CINE) award (2008, 2009), an Interactive Media Award (2010) and an Emmy nomination (2010). The resources provided vary from video content, to kid magazines and iPhone applications, offering children the opportunity to sing along and personalize songs with each other.

The goals of the Sesame Street Workshop are as follows:

- Model strategies for perseverance as children deal with frustrations and challenges of daily life as a military child
- Foster communication and connectedness between children and family members during times of separation and change
- Model age-appropriate problem-solving and conflict resolution skills and provide children with opportunities to practice these skills through creation of stories and songs
- Provide school aged children (ages 6-9) with tools to acquire new vocabulary to express their emotions

Overall, both the HH program and the Sesame Street Workshop have become innovative programs, with the creation of multiple products to assist and educate both children and families experiencing issues with psychological health, traumatic brain injury and parents who may be deployed. Community friendly, these products have met customer expectations and have built partners across a variety of organizations to enhance and provide successful, valuable information to service members and their families.

### **MILITARY YOUTH: A SCHOOL PERSPECTIVE**

*Catherine Bradshaw, Ph.D., M.Ed, Johns Hopkins Military Child Initiative, Johns Hopkins Center for Prevention and Early Intervention, Johns Hopkins Center for the Prevention of Youth Violence*

- Early clinical observations and qualitative studies characterize children and adolescents as experiencing distress as a result of parental military service
- In 2005 BRAC (Base Realignment and Closure) resulted in more than 10,000 additional family members being relocated, in addition to the typical annual family rotation, which in turn affected more than 32,000 school-aged children

Since September 11, 2001, more than one million troops have been deployed for increasingly longer tours of duty. Approximately 1.2 million school-aged children have parents who are on active duty and are consistently impacted by the absence of that parent, effecting both academic and behavioral areas of development. These school-aged children are at an increased risk due to stress induced by military life, with aspects such as relocation, friendship loss, concern over military parent's well-being and assuming some parental responsibilities. These transitions are especially difficult for middle school students. They tend to be the most susceptible to stress and report varying coping strategies based on changing developmental needs.

Early clinical observations and qualitative studies characterize children and adolescents as experiencing distress as a result of parental military service. The



**Catherine Bradshaw, Ph.D.**



military family syndrome, as described as a pattern of maladjustment and psychopathology, has been studied throughout war time and deployment into war zones for families, specifically with children. Military families move approximately four times as frequently as civilian families, typically moving every two to three years, and providing a greater distance away from family and social networks. In 2005 BRAC (base realignment and closure) resulted in more than 10,000 additional family members being relocated, in addition to the typical annual family rotation, which in turn affected over 32,000 school-aged children.

There are a number of stressors for students of military families which in turn, create many tensions at home. Unpredictable and frequent moves are problematic for all family members; relocation produces tension and often results in anger towards the military and the parents. There are also stressors on peer relationships. Students often report feeling friends acting differently or pulling away from the friendship to prepare for an upcoming move, resulting in a difficulty in both initiating and maintaining close friendships. Adapting to new social settings can be increasingly difficult as youth progress through school, given that social groups can already be formed and difficult to break into. Additionally, military students who attend schools on base tend to experience fewer stressors than students who attend schools in area with a lower military student population. The sense of “community” while living or attending school on base can be lost if transferring to an off base location. Research indicates that common stressors for military youth include adapting to new school environments, forming new friendships, and meeting course credit and academic requirements, which often vary by state.

Although there are multiple stressors and difficulties induced by military life, there are a number of positives of being a military youth. Military students are perceived as being better at handling transitions than their civilian counterparts and may be more self-sufficient or resilient to new environments. Multiple moves sometimes presented a chance to “reinvent” themselves and try new aspects of their personalities. The acculturation process experienced by military students, though taxing, appears to also have resulted in higher levels of tolerance and appreciation for diversity.

There are a variety of recommendations in assisting and alleviating the stressors that may come about in being in a military family. These include:

- Increase communication between schools and families
- Foster connections among students
- Provide training for teachers and staff for techniques on connecting with military students
- Develop school policies and procedures to support military students

### **THE NEW ENGLAND COLLABORATIVE FOR VETERANS WITH TRAUMATIC BRAIN INJURY AND THEIR FAMILIES**

*Ms. Debra S. Kamen, M.S., Director, Statewide Head Injury Program at the Massachusetts Rehabilitation Commission (MRC)*

- The state of Massachusetts has received a number of Health Resources and Services Administration Maternal and Child Health Bureau (HRSA/MCHB) funded grants from the Department of Health and Human Services (DHHS) to develop and work with Massachusetts veterans with traumatic brain injury
- There have been multiple successes within the NE Symposium, including interagency collaboration, outreach, employment, and integrated case management

With the number of service members coming back from deployments, the state of Massachusetts has brought together a number of systems in order to maximize effectiveness in supporting our veterans coming home from the war. The state of Massachusetts has received a number of HRSA/MCHB funded grants from DHHS to develop and work with Massachusetts veterans with traumatic brain injury. In May 2009, the New England Collaborative (NEC) held the New England Symposium for veterans with TBI. New England is a region where a veteran can live in one state, be deployed from another state, get employed in another state,



and receive care from another state. Recognizing that Massachusetts was not the only state creating approaches to TBI care, this symposium was developed to bring people together to hear from one another about what TBI affected patients were doing in terms of recovery and what was working vs. not working. The NE Symposium highlighted creative approaches across the region with feedback from Maine, Massachusetts, New Hampshire and Vermont.

There have been multiple successes within the NEC, including interagency collaboration, outreach, employment and integrated case management. The NEC has partnered with a

variety of organizations, including: 1) the National Guard and reserves, 2) veterans' organizations, 3) polytrauma centers, 4) mental health services, 5) the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury and 6) the Defense and Veterans Brain Injury Center. Goals of the NEC include information and resource sharing, training opportunities, joint program development and improving transition from military to civilian life.

The NEC organization has outlined a variety of priorities and committee activities that will be accomplished over the next two years. The establishment of a New England resource directory for active duty military will provide an index of available resources and services. The NEC is also working to implement a "Buddies for Vets" program that will create a local level support system, encouraging veterans to seek the health care services they need. A final priority of the NEC includes enhancing the community/state college experience for veterans.

There are, however, challenges in implementing and tracking progress of the NEC. There are multiple and competing demands on members and often restrictions on out of state travel, which leads to limited participation. Overall, although the NE Symposium has offered a variety of assistance to veterans returning home, there are still many challenges in developing and tracking a return on investment within the program.



**Ms. Debra S. Kamen, M.S.**

## DAY 2 PROCEEDINGS

### VIEW FROM THE STATES: COMMUNITY-BASED INTERVENTIONS FOR VETERANS

#### MEMPHIS POLICE DEPARTMENT CRISIS INTERVENTION TEAM AND MEMPHIS VA MEDICAL CENTER: A COMMUNITY PARTNERSHIP

*Thomas M. Kirchberg, Ph.D., ABPP, Chief Psychologist, VA Medical Center Memphis*

- Approximately 8 percent (1,100,000) of annual jail bookings have current symptoms of serious mental illness
- The Memphis model training enlightens law enforcement personnel on veteran-specific issues, including PTSD and TBI, to better inform encounters with veterans in crisis

At least 16 percent of inmates in jails and prisons have a serious mental illness. Due to decreased funding for psychiatric help, police officers are placed on the front line of treating psychological health. It is common for individuals with mental illness to rotate back and forth between homelessness and prison. Annually in the United States, approximately 11.4 million people are arrested and booked into jails. Approximately 8 percent (1,100,000) of annual jail bookings have current symptoms of serious mental illness. Of these, approximately 75 percent have co-occurring substance use disorders. Persons with mental illness frequently cycle back and forth from homelessness to incarceration. According to Secretary Shinseki from the Department of Veterans Affairs, a goal for the VA is to reduce the current number of homeless veterans. Currently, veterans comprise 10.4 percent of US adults, 11.7 percent of jail inmates, and 9.4 percent of State and Federal Prison inmates.



**Thomas M. Kirchberg, Ph.D.**

On May 27, 2009, each VA medical center (VAMC) was required to designate a veterans justice outreach specialist (VJO) responsible for: 1) direct outreach, 2) case management, 3) liaison with local justice system partners, and 4) provide or coordinate training for law enforcement personnel on Veteran-specific issues. By training law enforcement personnel, the VA has become heavily involved in court systems, assisting in getting veterans into treatment rather than jail or prison. According to the VA deputy undersecretary for Health for Operations and Management: "Law enforcement crisis Intervention Teams (CIT) are another promising avenue for connecting justice-involved Veterans with needed mental health and other services. Memphis, Tennessee, and other communities have implemented the Memphis model, training provided for community Mental Health professionals, experienced CIT officers, community legal system professionals, and persons with mental illness. The purpose of this training is to enlighten law enforcement personnel on veteran-specific issues, including PTSD and TBI, to better inform encounters with veterans in crisis.

The VA Medical Center Memphis provides eight different CIT training modules, which include: 1) PTSD didactic, 2) combat veterans and CIT officer's dialogue at VAMC Memphis, 3) traumatic brain injury didactic, 4) introduction to verbal skills didactic, 5) verbal skills building exercises, 6) crisis de-escalation training, 7) ride-along with CIT Officers, and 8) in-service training. The combat veterans and Memphis police department CIT dialogue is extremely powerful as it provides combat veterans an opportunity to talk with police officers about how people with PTSD may present in crisis situations, providing suggestions for successful crisis intervention. It also provides a platform for Veterans to share their personal experiences and knowledge of



PTSD with police officers, while giving police officers the opportunity to interact with veterans diagnosed with PTSD in a non-crisis situation, thereby decreasing stigma associated with PTSD.

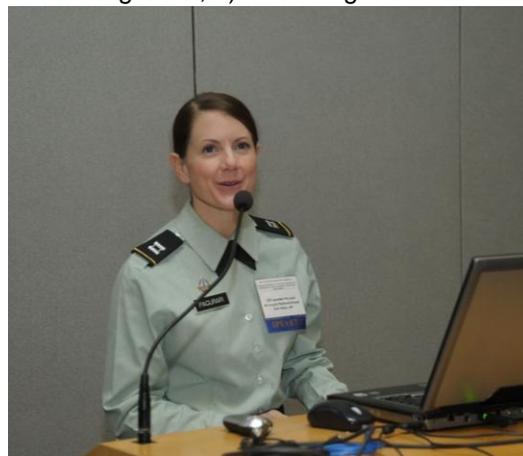
### **MICHIGAN ARMY NATIONAL GUARD BUDDY TO BUDDY (B2B): PEER SUPPORT AND RESILIENCE TEAMS**

*CPT Jennifer Pacurari, LLMSW, OIC, MIARNG, Office-in-Charge, Michigan National Guard Buddy to Buddy Peer Support and Resilience Teams*

- The Buddy 2 Buddy (B2B) Program provides training and resources to Michigan Army National Guard soldiers in order to enhance soldier-to-soldier support and resilience
- Currently, the B2B Program has 34 active volunteer veterans, 250 soldiers in units trained, and 25 armories staffed

Citizen-soldiers face unique psychosocial challenges upon returning from deployment, which include: 1) re-entry into civilian job market, 2) economic difficulties, 3) family/civilian work reintegration, 4) balancing military/civilian social norms, 5) increased anger and use of substances, and 6) disturbances in sleep. Data collected by the University of Michigan and Michigan State in 2009 indicates that 50 percent of Michigan Army National Guard soldiers, who needed help, sought it. Treatment seeking, entry, and adherence are crucial barriers that must be overcome in order to reach the 50 percent of soldiers with an identified need, who do not seek help. Additionally, diminishing these barriers will assist in the decrease of stigma associated with seeking assistance.

In additional research, service members were asked how likely they would be to talk to a number of different individuals if they "were struggling with stressors, problems, or symptoms of depression, PTSD, anxiety or substance use." Results indicated that soldiers more frequently endorsed being "highly likely" to talk to their spouse (47 percent), in-unit military peer (30 percent), military chaplain (25 percent), an officer (17 percent), civilian doctor (17 percent), or military doctor (15 percent). These findings reveal that peers provide crucial social support to other Soldiers. In an effort to encourage this demographic to seek help, The Michigan Army National Guard has implemented the Buddy 2 Buddy (B2B) Program, which provides training and resources to Michigan Army National Guard soldiers in order to enhance soldier-to-soldier support and resilience. The objectives of the *Road to Reintegration: Buddy 2 Buddy* Program include: 1) peer connection and support, 2) reduction of stigma associated with asking for help, 3) improved access to care, 4) early intervention, 5) soldier and family resilience and 6) soldier retention.



**CPT Jennifer Pacurari, USA, LLMSW**

The foundation of the B2B teams is based on encouraging soldiers to establish relationships with veteran peers both within and outside of the unit. Research has demonstrated that the context of a community that cares can assist in a service member's resilience. As a result, these programs also connect service members and their units to the larger community, generating a support system that enables soldiers to talk, ask questions and receive assistance navigating resources such as the VA. The B2B Program has 34 active volunteer veterans, 250 soldiers in units trained, and 25 armories staffed (60 percent). By the end of fiscal year 2011, the B2B Program aims to have 44 (100 percent) of armories staffed and more than 80 veteran volunteers enrolled in the program. Since January 2010, 238 soldiers have received assistance from the B2B Program.

### CONNECTICUT VETERANS' JAIL DIVERSION AND TRAUMA RECOVERY INITIATIVE

*Mr. Jim Tackett, Director of Veterans Services, Connecticut Department of Mental Health and Addiction Services (DMHAS)*

- The Veterans' Jail Diversion program places an emphasis on "pre-booking" which focuses on identifying, engaging and referring veterans to available programs at the earliest opportunities
- The Veteran's Jail Diversion program is unique in that it is the local mental health authority, providing mental health treatments and integrating services of multiple systems to strengthen access to appropriate and timely treatment/recovery services



**Mr. Jim Tackett, Director of Veterans Services**

The Veterans Jail Diversion Program is funded by a two million dollar, five-year grant from SAMHSA Center for Mental Health Services. Connecticut was one of the initial six states selected from a competitive bid process. Currently, there are 13 states that receive funding. The intent of the program is to divert veterans from incarceration to treatment facilities and other supportive services. There are numerous symptoms and behaviors that contribute to the arrest of a veteran such as: 1) anxiety, 2) firearms violations, 3) possession of illegal substance, 4) depression and 5) hypervigilance.

The Connecticut Veterans' Jail Diversion Program targets the newest generation of returning veterans. Relevant information about PTSD and evidence-based treatment indicates that nobody participates in war without being transformed in some ways. Therefore, when implementing the program, Connecticut decided to build upon existing strengths such as the statewide mental health jail diversion program implemented in 2000 and trained crisis intervention teams (CIT) located in communities throughout the state. Building on existing strengths enabled the state of Connecticut to utilize a systems integration approach when implementing the initiative.

The jail diversion program places an emphasis on "pre-booking" which focuses on identifying, engaging and referring veterans to available programs at the earliest opportunities. In order to achieve this goal, the state has incorporated police officers to help identify veterans in the community who need assistance. As a result, approximately 20 percent of referrals to the Connecticut Veteran's Jail Diversion and Traumatic Recovery Initiative were from police officers who had prior knowledge of the program. The other 80 percent of referrals typically came from the bail commissioner. The Veteran's Jail Diversion program is unique in that it is the local mental health authority, providing mental health treatments and integrating services of multiple systems to strengthen access to appropriate and timely treatment/recovery services. As a result, there is strong coordination between available services.

Below are a few of the goals outlined in Connecticut's strategic plan:

- Build a new services delivery model that combines the strengths of each participating federal, state and community stakeholder, thereby offering diverted veterans an array and wealth of treatment and recovery support options as they develop their individual service plans
- Establish a service planning process that values personal choice, contemplates and addresses the biopsychosocial needs of each veteran and assures that identified needs, including psychosocial needs, are addressed together and at once
- Secure sustainability of the work in the pilot region and successfully accomplish statewide implementation of jail diversion services for veterans

### COMMUNITY RESPONSES TO SUICIDE RISK: THE NATIONAL VETERANS' SUICIDE HOTLINE

*Ms. Victoria Bridges, Program Management Office, National Veterans' Suicide Hotline, National Call Center for Homeless Veterans*

- The national veterans suicide hotline uniquely applies the well-functioning, one-number, call center idea to the VA
- History indicates that when a suicidal individual begins talking, they are often able to think of reasons to stay alive

The national veterans suicide hotline uniquely applies the well-functioning, one-number, call center idea to the VA. When a veteran dials the suicide hotline their call is answered by a health science specialist, an individual with a graduate degree in social work, counseling, education counseling, or psychology. Health sciences specialists are trained in three crisis intervention models. These intervention models assist health sciences specialists in building a connection with the caller, generating a level of trust. All approved crisis intervention models include:

- Connecting with the caller
- Asking the caller if they are considering killing themselves
- Listening to their reasons for living and dying
- Identifying and reviewing the risk factors with the caller
- Considering ways to keep the caller safe
- Coming to an agreement about a plan for safety and follow-up



**Ms. Victoria Bridges, Program Management**

After the health sciences specialist completes the initial phone call, follow-up actions occur. These follow-up actions are important because they facilitate conversations with an individual who is suicidal. History indicates that when a suicidal individual begins talking, they often are able to think of reasons to stay alive. Within 24 hours of an initial call, the health technician calls the suicide prevention coordinator to determine if a consult has transmitted successfully. One week later, the health technician completes a medical record check to confirm contact with the caller has been attempted. Two weeks from the initial call, the health technician completes a medical record check to determine if the suicide prevention coordinator and caller are actively working on a suicide prevention plan. A month after the initial call the Health Technician completes a medical record check to determine the outcome of the intervention.

The national veterans' suicide hotline receives a range of calls from prank calls to suicides in progress. Call center data as of September 30, 2010, indicates:

- 318, 254 callers since July, 2007
- 170, 893 were identified as veterans
- 21,100 were calling to help a friend or family member
- 38,998 referrals
- 10,816 rescues
- 4,016 callers were active duty service members

## REINTEGRATION CHALLENGES AMONG OEF/OIF VETERANS AND THEIR FAMILY MEMBERS: IMPLICATION FOR SERVICE DELIVERY

### PAIN AND EMOTIONAL COMORBIDITIES AMONG OEF/OIF SERVICE MEMBERS: IMPLICATIONS FOR CARE

*Michael E. Clark, Ph.D., Clinical Director, Chronic Pain Rehabilitation Program; Director, VA National Pain Team Training Program; Chair, VA National Polytrauma Pain Workgroup; Associate Professor, Department of Psychology, University of South Florida*

- Up to 96 percent of polytrauma patients report pain issues with a majority experiencing emotional comorbidities
- Post-deployment multi-symptom disorder (PMD) refers to a constellation of overlapping physical and emotional symptoms common among OEF/OIF service members, negatively impacting quality of life, daily functioning and transition to life as a civilian

Approximately 40-45 percent of OEF/OIF personnel registering for VA care report pain, with headaches predominate in both cohorts. Up to 96 percent of polytrauma patients report pain issues, with a majority experiencing emotional comorbidities. The latest comorbidity data was collected during a VA-funded, two-site study examining polytrauma pain and emotional issues. Approximately 240 participants were recruited from the polytrauma network of care or local OEF/OIF registries. All participants were followed for 12 months, engaging in validated structured clinical interviews to establish DSM-IV diagnoses. Study findings indicated that persistent pain was present in 87 percent with an average level of pain at 4.1. In addition to the head and shoulder, the knee was an area of significant pain due to the heavy packs service members wear and the physical exertion they experience. Almost 60 percent of participants met criteria for at least one mental health diagnosis and about 50 percent of individuals had one or more anxiety disorders (not including PTSD). These results indicate a high degree of comorbidity, with pain being increasingly higher in those with comorbidities, leading to functional and psychological difficulties.

Referring to a constellation of overlapping physical and emotional symptoms common among OEF/OIF service members, PMD can negatively impact quality of life, daily functioning and transitioning to life as a civilian. Most common problem areas are pain, PTSD, mTBI, Substance Use Disorder (SUD), and sleep problems. This disorder tends to be more frequent and/or severe in those exposed to multiple blasts. PMD has a shared core of problem areas or symptoms not being addressed in specific treatment programs for single conditions. By not addressing PMD, it is difficult to keep individuals in treatment, especially since some do not meet criteria for one program over another. Providers continue to report that veterans treated in primary care have significant mental health problems that primary care cannot adequately solve due to their complexity. As a result, it is necessary for individuals with PMD to go through an integrated care treatment approach focused on the combination of problems and shared coping difficulties across



**Joan Griffin, Ph.D., Michael E. Clark, Ph.D.,  
Dr. Karen Seal, M.D., Nina A. Sayer, Ph.D.**



problem areas.

The Tampa VA has developed a stepped PMD approach, which has increased the retention of service members and veterans in treatment. Step one is a post-deployment clinic PMD screening where individuals receive a primary care medical examination, a mental health orientation and brief screening; a full screening and brief treatment for mild symptoms; and referral for moderate or severe problems. Step two is an integrated PMD care program focused on function and quality of life, rather than symptoms and diagnoses. The Center for Post-deployment Health and Education (CPHE) was designed to more efficiently deliver symptomatic and preventive care to an expanded range of returning service members who experience functional impairment in multiple life roles due to PMD. The objectives of this care are to maximize function and life adjustment, while preventing impairment or disability symptom development or exacerbation. Treatment is provided by an intensive outpatient program with new integrated care approaches over one to three months. The third step is comprised of specialty programs focused on PTSD, pain and TBI. It is evident that existing approaches need to be refined and adjusted to individual schedules as much as possible while utilizing technology when possible to aid treatment.

Future directions include extending and refining PMD treatment components, increasing consumer focus and expanding stepped care approaches for pain treatment. Future research will identify how overlapping comorbidities interact; determine the most effective treatments for PMD; evaluate whether stepped care improves outcomes compared to standard care; and identify any increased health and adjustment risks associated with blast exposure.

### **POLYTRAUMA AND BLAST RELATED INJURIES: SYSTEMS OF CARE AND CHALLENGES FOR FAMILIES**

*Joan Griffin, Ph.D., Research Investigator, Center for Chronic Disease Outcomes Research, VA HSR&D Center for Excellence at the Minneapolis VAMC, University of Minnesota School of Medicine*

- The Family and Caregiver Experiences Study (FACES) aims to give a face and voice to the caregivers whose work is not always seen in clinical care or everyday life
- Results demonstrated that 43 percent of caregivers provide no less than five hours of care per week and 17 percent provide more than 80 hours of care per week

Caregivers are highly engaged advocates for quality and safety, and critical in helping veterans obtain and use health care services. However, little is known about caregivers of polytrauma patients, especially after patients are discharged from inpatient rehabilitation. The Family and Caregiver Experiences Study (FACES) aims to give a face and voice to people whose work is not always seen in clinical care or everyday life. The objective of the study is to describe who is providing care, the caregiver's burden of care (number of hours per week) and the type of care provided. This cross-sectional, mixed methods study focused on family members of OEF/OIF injured service members with TBI/polytrauma. Caregivers of all patients discharged for at least three months between the years of 2001-2009 were eligible for this study. Individuals listed as next of kin in medical records were assumed to be the family caregiver and were sent a survey that questioned caregiver background characteristics and objective burden (what and how much care is provided). Questions on the survey also focused on caregiver proxy reports about care recipients, such as care recipient background characteristics and care recipient injury information. Measurements were all self-reported from the caregivers. Follow up was conducted with 19 participants during three hour long, in-depth interviews at their homes.

More than 1,000 individuals who qualified for the study and were sent a survey, 55 percent responded. Demographics indicated that caregivers were mostly married women, with 60 percent being employed. More parents than spouses are caregivers with 60 percent being mothers or fathers and 35 percent being spouses. Results demonstrated that 43 percent of caregivers provide no less than five hours of care per week and 17 percent provide more than 80 hours of care per week. There is a variation in the tasks people are completing between activities of daily living (feeding, bathing) and independent activities of daily living (shopping, cooking). While 25 percent are helping veterans with both activities of daily living and



independent activities of daily living, 30 percent report they are not helping with either. Additionally, 90 percent of caregivers say they support emotions or feelings and navigate the health care system, legal system, and benefits system. Most injured veterans live with their caregiver but 37 percent live independently.

There is a crucial need for training that helps caregivers provide emotional support and explains how to best navigate the system. However, results indicate there are large gaps between caregivers who indicated they desired training and people who actually received it. It is important to recognize that there are many demands on a caregiver's life. A large number are providing care to children and some are caring for an additional dependent adult. Furthermore, 60 percent of caregivers are employed or attending school. Due to the young age of veterans and caregivers, long term support systems are needed. In order to better assist caregivers, additional efforts must focus on addressing training, support and information gaps.

### **REINTEGRATION PROBLEMS AND TREATMENT INTERESTS AMONG IRAQ AND AFGHANISTAN COMBAT VETERANS WITH AND WITHOUT PROBABLE PTSD**

*Nina A. Sayer, Ph.D., LP, Polytrauma and Blast-Related Injuries QUERI, VA HSR&D Center of Excellence at the Minneapolis VAMC, University of Minnesota*

- The intent of this research is to describe the association between probable PTSD and reintegration problems among OEF/OIF combat veterans
- Individuals who screened positive for PTSD experienced greater difficulty with reintegration than those who screened negative for PTSD

More than two million US service members have been deployed to Afghanistan or Iraq in support of Operation Enduring Freedom and Operation Iraqi Freedom (OEF/OIF). Those deployed during OEF/OIF often carry a high burden of mental disorders, with PTSD being most prevalent. The intent of this research is to describe the association between probable PTSD and reintegration problems among OEF/OIF combat veterans, while exploring treatment interests. The project design was comprised of a mail survey of a national, stratified sample of OEF/OIF combat veterans enrolled in VA. The sampling strategy identified OEF/OIF combat veterans who made at least one visit to VA between October 2003 and July 2007. Individuals were stratified by region (six regions), gender and race (two races: white, nonwhite), and randomly sampled from the 24 (6 x 2 x 2) groupings. A survey was distributed to these individuals that included questions on background characteristics, physical and mental health, community reintegration problems, and treatment interests. A statistical analysis was conducted, weighting prevalence and proportions to represent the population of OEF/OIF combat veterans who use the VA.

Of the 1226 surveyed, 754 (62 percent) returned the survey material. Of the 754 returned, 411 (55 percent) were returned by females and 388 (49 percent) were returned by people stratified as non-white. Clinical characteristics of the population indicate that 41 percent suffer from probable PTSD, 38 percent suffer from a probable drug or alcohol problem and 21 percent suffer from both probable PTSD and a probable drug or alcohol problem. These findings demonstrate that the overall mental and physical health of the surveyed population was poorer than that of the U.S. population.

According to survey responses, individuals who screened positive for PTSD had more difficulty forming and maintaining social relations. Of participants who screened positive for PTSD, 87 percent responded that they had some to extreme difficulty confiding or sharing personal thoughts or feelings, compared to the 35 percent who screened negative for PTSD. Likewise, 63 percent of participants who screened positive for PTSD noted difficulty getting along with a spouse or partner, compared to 27 percent of those who screened negative for PTSD. Similarly, 78 percent of those who screened positive for PTSD noted some to extreme difficulty in taking part in community activities, compared to 29 percent who screened negative for PTSD.

Individuals who screened positive for PTSD experienced greater difficulty with reintegration than those who screened negative for PTSD. For example, 84 percent of individuals with PTSD reported more problems



controlling anger since homecoming versus 38 percent who did not see positive for PTSD. Furthermore, 61 percent of respondents with a positive PTSD screen reported thoughts or concerns about hurting someone as opposed to 17 percent who were not experiencing PTSD. Results demonstrate that a vast majority of respondents (96 percent) of OEF/OIF combat veterans enrolled in VA would be interested in services for community reintegration problems. Types of services desired include therapy, information on available benefits and job training. Additionally, a majority of those with PTSD would be interested in receiving information about available medications. Almost 100 percent of people surveyed noted they have access to the internet and would like to receive information through that channel. Overall, this research demonstrated that reintegration problems were particularly prevalent in OEF/OIF combat veterans with probable PTSD. However, it is important to recognize that reintegration problems were not absent in those who screened negative for PTSD.

### **INTEGRATING PRIMARY CARE AND MENTAL HEALTH FOR OEF/OIF VETERANS AT THE SFVAMC: PRELIMINARY OUTCOMES AND FUTURE DIRECTIONS**

*Dr. Karen Seal, M.D., MPH, San Francisco VA Medical Center, University of California, San Francisco  
Departments of Medicine and Psychiatry*

- Less than 10 percent of OEF/OIF veterans with new PTSD diagnoses have received what would approximate minimum evidence-based treatment
- The mission of the integrative care clinic is to bring mental health (and social work) into primary care by decreasing stigma, honoring military service, facilitating re-adjustment and community reintegration, focusing on function and providing coordinated co-located care
- The initial 3 part integrative care visit with providers trained in post-deployment health significantly improved access to an initial mental health evaluation for OEF/OIF veterans compared to usual care (UC)

Data indicates that 37 percent of OEF/OIF veterans in VA health care nationwide have received mental health diagnoses, and 25 percent have received new PTSD diagnoses. Less than 10 percent of OEF/OIF veterans with new PTSD diagnoses have received what would approximate minimum evidence-based treatment. Barriers to mental health care can include: 1) stigma/shame, 2) competing priorities, 3) geographic distance, 4) symptoms of mental health problems such as avoidance, denial, apathy and 5) "battle mind." It is often very difficult for veterans to schedule medical visits due to education or childcare responsibilities and challenges in geographical distance. The symptoms of health care problems themselves create barriers to seeking care. PTSD is characterized by avoidance of trauma reminders, including relationships with providers. In regard to the "battle mind," veterans are trained that symptoms of being hypervigilant are normal. They don't believe they have a problem because they have to act a certain way to protect themselves and their families. Motivational interviewing can help patients realize that these symptoms are not adaptive as they attempt to transition home. Research has demonstrated that patients with mental health problems do not want to get help but do have high rates of medical problems. To resolve this issue, an integrative approach that marries medical, mental health care and social services is necessary.

Three years ago, numerous multi-disciplinary providers gathered to develop a post-deployment integrated care clinic that would meet the needs of OEF/OIF veterans. The mission of this clinic is to bring mental health (and social work) into primary care by: 1) decreasing stigma, 2) honoring military service, 3) facilitating re-adjustment and community reintegration, 4) focusing on function and 5) providing coordinated co-located care.

This clinic recognizes that primary care is not solely focused on physical disease and works to break down barriers to seeking care by normalizing the concept of mental health care.

Upon entering the clinic, veterans undergo routine post-deployment mental health and TBI screening using a national PTSD screen and alcohol and depression screening. The results and patient are brought to a clinician who conducts a focused history and assessment of the psychiatric and physical problems that occurred during service, determining if those problems may still be active. The provider then gives the patient the option to see a post-deployment stress specialist, which is accepted by most people. "Warm hand-offs" are provided to the "combat stress specialist" and "combat case manager" for further evaluation, education/psychoeducation, triage and referral. Depending on positive PTSD/depression screens and interest, the patient can see a mental health provider or social worker, but these are not automatically included in the visit.



**Joan Griffin, Ph.D., Michael E. Clark, Ph.D.,  
Dr. Karen Seal, M.D., Nina A. Sayer, Ph.D.,**

From April 1, 2007, to January 1, 2009, 347 new OEF/OIF veterans were seen in primary care. Two hundred and thirty patients participated in the integrated care (IC), three-part, pre-scheduled visit with a primary care provider, mental health provider and social worker. The other 117 participants ended up in the UC treatment where they had primary care without optional mental health and social work services on the same day. Data indicates that 89 percent of patients in integrated care had same day mental health visit, compared to 51 percent in usual care. Women are greater beneficiaries of the integrative clinic. Only 29 percent in UC had a mental health evaluation after 30 days, but 91 percent received mental health evaluation in the integrative approach. There is not a statistical difference for men.

Uniformly, OEF/OIF veterans who screen positive for one or more mental health disorder have a much higher likelihood of seeking evaluation within 30 days. The initial, three-part IC visit with providers trained in post-deployment health significantly improved access to an initial mental health evaluation for OEF/OIF veterans compared to UC. Women veterans and those with positive mental health and TBI screens had a higher likelihood of an initial mental health evaluation if first seen in IC vs. UC primary care. Lastly, veterans with an initial IC (versus UC) were more likely to have at least one specialty mental health visit, but engagement was poor and there was no difference in mental health follow-up for veterans with positive screens. Future directions for this study include considering the addition of brief mental health treatment within primary care. Additionally, researchers should consider the addition of a "Care Manager" to enhance patient engagement in mental health treatment and bolster collaboration between primary and mental health providers.

## WORKING LUNCH

### LIFE IN THE WEEDS

*Shelley McDermid-Wadsworth, Professor, Department of Child Development and Family Studies, Purdue University; Director, Military Family Research Institute, Purdue University*

- Polytrauma requires a 'poly' approach, focusing on the cognitive, interpersonal, mood, functional skills, personal and family relationships and employment issues surrounding the sufferer and his or her family

- A taxonomy of engaged scholarship from broadest to most specific includes: 1) civic literacy/awareness, 2) information networks, 3) community partnerships, 4) participatory research and 5) public scholarship

The Military Family Research Institute was created in 2000 as purely a research institution and remained that way for a number of years. In 2007, the institute was asked to perform useful services for the state of Indiana to make it better equipped to serve military families. As a result, The Military Family Research Institute became both a research and outreach organization with five strategic goals, which include: 1) supporting military communities, 2) strengthening civilian communities, 3) generating important new knowledge, 4) influencing programs, policies and practices and 5) growing and sustaining a vibrant learning organization. Thematically, research of the institute focuses on family processes of reintegration, the experiences of military children; "Families on the Fringe" - families that don't meet the typical definition of "family" for purposes of recognition/benefits from the military, family adjustment to wounds and injuries; and interaction with the health care system. The institute evaluated interaction with the health care system to assess the accuracy of the TRICARE provider list in Indiana. To the extent that the list is inaccurate, care is less accessible. Research indicated that 75 percent of listed TRICARE providers in the state were no longer taking TRICARE-insured patients.



Shelley McDermid-Wadsworth, Ph.D.

Dr. McDermid-Wadsworth called her talk "Life in the Weeds" because she lives in a state with very few active duty service members, which increases the difficulty of conducting outreach for those in the military.

The presentation by Dr. McDermid-Wadsworth was related to *bio-ethical theory*, which is that humans develop in microsystems, which are specific settings such as home, school, workplaces that include activities, social roles, and interpersonal relationships, and provide opportunities for increasingly complex interactions and learning. Microsystems are connected by mesosystems and the stronger, more positive and more diverse the links between settings, the more powerful and beneficial the resulting mesosystem will be as an influence on development. Stronger, more positive and diverse mesosystems are more powerful developing forces while weaker mesosystems lead to conflict of value, style and interest.

Mesosystems can threaten polytrauma victims in the following ways: 1) overlapping and delayed symptoms, 2) mental health comorbidities, 3) misinformation about TBI, 4) lack of holistic approach, 5) poor coordination among helpers and 6) stigma. In order to fix severe problems like polytrauma, it will take a lot of people and things to work to synchronize and reinforce each other. Polytrauma requires a 'poly' approach focusing on the cognitive, interpersonal, mood, functional skills, personal and family relationships and employment issues surrounding the sufferer and his or her family.

The state of Indiana is attempting to reach out to all people in the state who need more complex care by increasing the education of available resources. Dr. McDermid-Wadsworth referred to these efforts as "engaged scholarship," explaining that she is a professor who also conducts outreach and is involved in the practitioner community to better spread the knowledge for action. A taxonomy of engaged scholarship, from broadest to most specific, includes: 1) civic literacy/awareness, 2) information networks, 3) community partnerships, 4) participatory research and 5) public scholarship.

1. *Civic literacy/awareness*: A community outreach program for libraries, called "Our Heroes' Tree," helps with civic literacy/awareness by providing a forum for libraries to erect heroes' trees with images of service members who have served our nation. This is a means to bring together



generations of individuals and to raise awareness about service members in local towns and cities. The Navy has adopted this program and placed trees in libraries throughout the world. The Heroes' Trees also have "How to Help" brochures next to them, which explain ways to help service members reintegrate into the community.

2. *Information networks:* It is possible that people may not know a classmate or co-worker has a loved one overseas. As a result, The Military Family Research Institute is actively working to educate other professional communities by raising awareness of these relationships through information networks, increasing visibility of how the military overlaps with everyday life.
3. *Community Partnerships:* It is difficult to build a community that can support military families when fewer than 75 percent of families have both parents and unemployment rates are rising. These limit financial resources, state funding of medical and mental health care, community organization and much more. However, there will soon be a community blueprint that will systematize more of this work, laying out a framework for what a military friendly community looks like, how a community can get there, and what makes a difference for military families. Every community is different and has diverse military needs so they must confront this problem differently.
4. *Participatory Research:* Indiana offers "Passport towards success," which is a program to help National Guard families reintegrate following a family-member returning from war. Aimed at children and families, it is tailored to a reintegration structure, is theory based, and flexible. The objectives of this program include increasing capacity to share and respond to feelings, fostering closer ties to family friends and community; promote strategies to attend to physical, mental, and emotional needs; and increase capacity to share and respond to feelings.
5. *Public Scholarship:* The Military Family Research Institute engages with partners around the state to generate new knowledge to improve the care of service members and their families by focusing on scholarships and the GI Bill. Operation Diploma is an initiative to increase the number of military children in college because their education can be funded by their parents' GI Bill benefits. This benefits universities since they are able to admit students who don't need financial aid; however, the initiative is being thwarted by misinformation about this funding and how it works. The program has helped enrollment increase significantly, 82 percent one year and 133 percent another year.

Community outreach is never self-sustaining so it will take constant work and outreach to advance this cause. Specific thorns that the Military Family Research Institute faces in this effort include: 1) uneven interest in military issues, 2) power struggles in communities, 3) capacity for work/volunteering, 4) shifting from awareness to mobilization, 5) documenting meaningful impact, 6) maintaining engagement and motivation and 7) the "center of the universe" problem.

## SESSION I: ACUTE BREAKOUT SESSION

### THE PSYCHOLOGICAL IMPACT OF POLYTRAUMA: FROM THE INDIVIDUAL TO THE COMMUNITY AND BACK AGAIN

*Suzy Bird Gulliver, Ph.D., DVA VISN 17 Center for Research on Returning Veterans; Professor, Texas A&M Health Science Center, College of Medicine*

- Although the majority of mild TBI (mTBI) symptoms dissipate within days to weeks of the injury, approximately 10-15 percent of veterans with mTBI will experience lingering physical, cognitive and behavioral symptoms
- Study results demonstrated that OEF/OIF veterans with persistent, post-concussive symptoms (PCS) were experiencing higher levels of psychopathology than veterans experiencing little to no PCS

Compared to previous generations, today's veterans are more likely to experience and survive a traumatic brain injury during deployment. Although the majority of mild TBI (mTBI) symptoms dissipate within days to

weeks of the injury, approximately 10-15 percent of veterans with mTBI will experience lingering physical, cognitive and behavioral symptoms. Mild TBI is also strongly associated with higher rates of PTSD in OEF/OIF veterans. However, overlap between post-concussive symptoms, PTSD and depression, as well as other complicating factors (e.g., multiple traumatic events); make the etiological model of comorbid mTBI and PTSD difficult to study.

Research examining mTBI is also equivocal on the long-term effects of post-concussive symptoms (PCS) of mTBI and their association with psychopathology and other functional outcomes. The objectives of this research were to: 1) measure the main effects of combat exposure and persistent PCS on PTSD and depression in a sample of returning OEF/OIF veterans and 2) examine which persistent PCS were most strongly associated with deployment problems after co-varying combat exposure. Baseline data were analyzed from an ongoing longitudinal research study of 108 OEF/OIF veterans. Participants were screened for mTBI and veterans endorsing current PCS were compared to those not endorsing current PCS. Approximately 52 percent of participants screened positive for mTBI and 46.3 percent screened with current persistent PCS symptoms. During the study, participants completed a baseline diagnostic interview and self-report questionnaires and were screened for combat exposure, PTSD and depression.

Study results demonstrated that OEF/OIF veterans with persistent PCS were experiencing higher levels of psychopathology than veterans experiencing little to no PCS, even after excluding overlapping PCS symptoms. After co-varying combat exposure, veterans who endorsed current symptoms of ringing in the ears and headaches had significantly worse PTSD and depressive symptoms. Additionally, those endorsing

dizziness also had worse depressive symptoms. These findings suggest that PCS symptoms have unique individual effects that may be particularly relevant to psychopathology.

These findings indicate that lingering PCS significantly impact veteran's post-deployment mental health. Treatments are needed to address the unique needs of veterans with PTSD/depression who have experienced mTBI and endorse current PCS. Additional research is needed to examine the individual and interactive effects of mTBI on psychopathology and functional outcomes.

### RESILIENCE AND COMBAT MEDICS

*Paula Chapman, Ph.D., James A Haley Polytrauma Center and Veterans Hospital, HSRD/RRD Center of Excellence in Maximizing Rehabilitation Outcomes*

- Combat medics take on some of the hardest roles in combat, both as service member and as life-saver. This can be emotionally taxing when combat medics are forced to treat enemy service members who are severely wounded
- Combat medics have unique psychological distress profiles amongst service members due to their unique role. Understanding this and training these combat medics for their job is essential to long-term force readiness

Combat medics are some of the most important service members in any unit and they are often the unsung heroes in war. They hold a dual role as both a service member and a front-line health care provider with the exhausting task of not only treating service members and allies, but also civilians and enemy combatants. This can lead to



Paula Chapman, Ph.D.



conflicting decisions on the battlefield when rules of engagement dictate that the most severely wounded must be treated first. Often, in these situations a combat medic is forced to treat an injured enemy who was shooting at his or her unit just minutes before.

The overwhelming stress placed on combat medics, forced to perform multiple roles, including that of healthcare provider to the enemy, takes its toll on them in a way that is unique among service members. One British study found that, when comparing the behavioral health of deployed medics with all other military occupational specialties during the Iraq War, medics are more likely to report psychological distress and fatigue than other personnel. This is especially true if those combat medics had traumatic medical experiences, such as treating a close friend on the battlefield who ultimately died under his or her care. Nevertheless, this study revealed that protective factors, such as group cohesion, a combat medic's leadership team, their own preparedness for battle and their post-deployment experiences, can mitigate the higher rates of post-traumatic stress.

The U.S. Army has launched collaborative studies to understand the challenge of combat medic psychological distress in order to better prepare this key group of service members for the battlefield. The Combat Medic METL Study is an effort of collaboration between Tulane University, branches of the U.S. Army and Air Force, and the James A Haley VA, where they are currently examining the relationship between preparation for medic deployment and various risk and protective factors. The goal of this 3-year study is to create an initial model of resiliency for the deployed combat medic. A major finding thus far is that unit cohesion is a major protective factor and is an effective tool for mitigating psychological distress in combat medics regardless of level of stress exposure.

Preliminary data from the original study has led the military to enhance the development of protective factors in combat medics during training. This includes simulated war environments in training, with measuring psychophysiological factors to predict performance in real war. In order to understand this unique subset of our nation's warriors, further research must be done, especially longitudinal studies.

Understanding the unique burdens placed on combat medics, and enabling them to succeed in battle, is of utmost importance to the military health system. These service members are force multipliers who singularly can make or break a unit's combat effectiveness and long-term force readiness at the local level. Since the burden of taking on the hardest tasks in a unit can affect any young enlisted service members in the military, training and pre-deployment mobilization must be adapted to equip these combat medics with the tools they need to carry out their mission.

### **RESILIENCE EFFORTS TO ASSIST RECOVERY FOR FAMILIES AFFECTED BY POLYTRAUMA**

*Dr. David Brown, Psy.D., Clinical Psychologist, Subject Matter Expert, Recovery Care Support, The Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury*

- Total Force Fitness focuses on both the mind and body by addressing a soldier's spiritual, psychological, behavioral, and social needs with their physical, nutrition, medical and environmental needs
- Researchers in the military health system are trying to develop best practices for communicating and educating effective strategies for these injuries, as well as best practices for providing family-centered care

Due to an increase in both wounds, such as TBI, in the contemporary operating environment and PTSD following exposure to combat, the military has launched comprehensive resilience efforts to prepare soldiers for the modern battlefield and the stressors of combat. This resilience effort, Total Force Fitness, is "a state in which the individual, family, and organization can achieve and sustain optimal well-being and performance under all conditions." Total Force Fitness focuses on both the mind and body by addressing a soldier's spiritual, psychological, behavioral and social needs with their physical, nutrition, medical, and environmental needs.

Total Force Fitness is comprised of multiple core messages, including: 1) early treatment works, 2) reaching out for help is an act of courage and strength, 3) help is always available and you are never alone, 4) practice realistic optimism and 5) post-traumatic growth is possible. Resilience and Total Force Fitness apply to both soldiers and families, as both groups require the ability to respond positively to an adverse situation and emerge feeling strengthened to succeed in this protracted combat situation. This resilience is essential in cases of polytrauma, which is when two or more injuries are sustained, resulting in physical, cognitive, psychological or psychosocial impairments and functional disabilities.



**David Brown, Psy.D.**

Long-term care and support is needed for families coping with these polytrauma injuries, especially during the transition from acute care to chronic and long-term care. This goes hand-in-hand with the need for a successful transition from institutional (hospital) care to informal and family care. Research has not fully demonstrated which coping mechanisms families choose to employ and which strategies are most effective in the long run. However, researchers in the military health system are trying to develop best practices for communicating and educating effective strategies for these injuries, as well as best practices for providing family-centered care. Since the caregiver is instrumental to resilience and healing, a caregiver with a direct relationship to the patient can help mitigate the effects of a polytrauma on both injured soldier and other family members.

Since caregivers are often working full time in addition to providing care to other family members, it is essential that they embody resilience and are able to manage the meaning of their responsibilities. The role of the caregiver typifies why family resilience and Total Force Fitness is essential. Furthermore, developing strong families is essential to the resilience, recovery and reintegration of our soldiers. The Support and Family Education (SAFE) program is a monthly, one and a half hour, confidential workshop, developed to empower families and friends of individuals with polytrauma.

These workshops assist family members and friends develop communication tools to better balance the illness with other family needs. When possible, attributing positive meaning to the situation, staying engaged in the community, maintaining social integration, and developing collaborative relationships with professionals can aid in polytrauma recovery for both service members and their families. Numerous web sources exist to assist families in this transition, such as [afterdeployment.org](http://afterdeployment.org), [inTransition](http://inTransition), [realWarriors.net](http://realWarriors.net), [Military OneSource](http://MilitaryOneSource) and [Militarytomedicine.org](http://Militarytomedicine.org), among others. All of these resources support the new paradigm of total force fitness, a comprehensive health outlook on the military and families that will create a more able force to confront security challenges in the 21st century.

### SESSION I: REHABILITATION BREAKOUT SESSION

#### FUNCTIONAL VISUAL LOSS AND DYSFUNCTION IN A VETERANS AFFAIRS (VA) TERTIARY MEDICAL CENTER

*Dr. Gregory Goodrich, Ph.D., VA Palo Alto Health care System, Palo Alto, California*

- Blast-induced injuries lead to higher rates of vision loss and other ocular injuries than do many other common types of accidents, such as a motor vehicle accident
- This study linking blast injuries and vision loss can help predict undetected injuries in service members, leading to better medical care



**Gregory Goodrich, Ph.D.**

The Department of Veterans Affairs (VA) Palo Alto Health care System in California conducted innovative studies on functional vision loss and dysfunction amongst injured service members and veterans. This study was able to demonstrate that patients with blast-related injuries had higher percentages of ocular trauma, loss of one eye and reported light sensitivity, as well as a lower percentage of strabismus than patients injured in a motor vehicle accident or other forms of trauma.

With a marked rise in blast-induced injuries in current combat zones, the military medical community has dealt with a new host of challenges surrounding blast injuries. The study tracked 115 patients with a mean age of 28.1 years old, with about half of the patients being treated for blast-related events, one quarter being treated for motor vehicle accidents and one quarter of the patients being treated for other injuries (including falls, assault, gunshot, shrapnel and anoxia). Some of the most pronounced findings involve trauma to the eye in which blast-injured patients had approximately four times the rate of injury reported than did motor vehicle accident or otherwise injured patients. Furthermore, blast-injured patients were approximately twice as likely to report light sensitivity as one injured in a motor vehicle accident.

This study has aided the military medical community understanding of how mechanisms of injury may play a role in vision loss. Specifically, the high correlation between traumatic brain injury (TBI), including mild TBI, and visual dysfunction suggests that this is a highly-vulnerable population to vision loss. This knowledge will allow the military medical community to target blast victims, specifically those suffering from TBI, for further vision screening. As a result, proper medical care can be directed towards visual injuries as soon as possible. The establishment of blast events as early indicators of vision loss can help predict and better treat injuries amongst service members, leading to improved quality of life and lower health care costs.

#### BALANCE DISORDERS AFTER CLOSED HEAD INJURY

*Captain Ben Balough, USN, M.D., Deputy Director, Clinical Research, Navy Medical Research and Development Center, Navy Medical Institute, Bureau of Medicine and Surgery*

- Pressure-induced injuries, made common by blast events in combat zones, are raising the profile of balance system injuries as a major threat to the force
- Severe dizziness as a result of blast events can lead to medical discharge from the armed forces

Due the rise of traumatic brain injury (TBI) and blast events in modern combat zones, pressure-induced injuries have become a persistent challenge for service members, veterans and the military health system

trying to treat these injuries. After a pressure injury, the ear responds to high-pressure events particularly sensitively, specifically the tympanic membrane otherwise known as the "pressure sensor" of the ear. Since the ear is a mechano-electric transducer, a high-pressure event can alter inner ear function and combine with closed-headed injury to affect the patient.

The ears (linear and angular accelerometers), eyes (reflex arcs), joints/muscles (receptors for position, spine reflexes) and central nervous system (integrator of inputs) are all vulnerable. These parts of the body provide a sense of not only what one sees in space, but also how one interacts with their whole world. As a result, injuries to the balance system can be highly destructive to quality of life.

During a medical examination after a blast incident or other closed head injury event, poor reflexes are a highly-reliable predictor of injury. Ear disorders are less common, but blown out ear drums, inner ear concussion and temporal bone fracture are very clear indicators of a balance system injury. A major consequence of an injury to the balance system is dizziness, which can be serious enough to warrant medical discharge from the armed forces. The four categories of closed head injury dizziness include: 1) post-traumatic positional vertigo, 2) post-traumatic exertional dizziness, 3) post-traumatic migraine associated dizziness (PTMAD) and 4) post-traumatic spatial disorientation.

Depending on the recovery time and severity, closed-head balance system injuries can become debilitating and discharge-worthy medical conditions. Early identification and treatments are the first step towards mitigating these injuries for service members and veterans.

### **AUDITORY AND VISUAL IMPAIRMENTS IN TRAUMATIC BRAIN INJURY (TBI): EMERGENCE OF DUAL SENSORY IMPAIRMENT**

*Henry L. Lew, M.D., Ph.D., CCC-A, Defense and Veterans Brain Injury Center (DVBIC), Department of PM&R, Virginia Commonwealth University, Richmond, VA*

- Severe TBI leads to joint hearing-vision impairment in 32 percent of cases
- Multiple sensory impairments make recovery more difficult and it is more difficult for patients to compensate for other cognitive deficits

Numerous injuries, such as burns and traumatic amputations, can result from blast or non-blast events associated with traumatic brain injury (TBI). Sensory impairments have been shown to exert an adverse impact on TBI patients' functional improvement, activities of daily living and their ability to interact with their immediate environment and with others. However, due to the lack of externally visible wounds, the co-occurrence of hearing and vision impairments (also known as dual sensory impairment, DSI) may not be noticed until patients were discharged to home.



**Henry L. Lew, M.D., Ph.D.**

The goals of this study were to document the prevalence of self-reported DSI and to identify contributing factors related to self-reported auditory and visual impairment in OEF/OIF service members who underwent a VA comprehensive TBI evaluation. A total of 36,919 veterans who received a TBI evaluation between October 2007 and June 2009 were entered into the database for analysis. Our final sample included 12,521 subjects judged to have deployment-related TBI and a comparison group of 9,106 subjects with no evidence of TBI.

A main finding was that the co-existence of sensory impairment was common. Depending on exposure to blast and TBI status, rates of visual impairment ranged from 8.5 percent to 15.7 percent; auditory impairment from 21.0 percent to 33.0 percent; and DSI from 22.7 percent to 35.4 percent.

The regression models showed that sensory impairment in one modality (i.e., auditory or visual) was the largest predictor for sensory impairment in the other modality. This finding suggests that either these impairments have a single source (e.g., brain trauma with associated dysfunction) or that damage to the two systems stems from a common source (e.g., blast wave, shrapnel). There is no evidence to suggest that impairment to one system leads to impairment in the other.

We suggest that veterans who screen positive for TBI also be systematically and comprehensively evaluated to determine the extent of sensory impairment. Identifying DSI could allow clinicians to collaborate and maximize rehabilitation.

## SESSION I: REINTEGRATION BREAKOUT SESSION

### COMBAT2COLLEGE

*Dr. Joseph Bleiberg, Ph.D., ABPP-CN, CLCP, Director, Center for Cognitive Neuroscience; Director of Psychology, Braintree Hospital*

- U.S. colleges are not equipped to take care of people with combat exposure and/or polytrauma
- Not a single U.S. college website has a statement of welcome home or thank you for your service
- C2C demonstrates that it is possible to create a “veteran friendly” college using efficient and inexpensive interventions

In this war, compared to most other wars over the millennia, there is not a sense of the same transition or cultural sensitivity toward returning service members. U.S. combat veterans of OEF/OIF are returning with mental health needs that can complicate educational achievement. Research shows that colleges are not equipped to take care of people with combat exposure and/or polytrauma. Not a single college website has a statement of welcome home or thank you for your service to veterans. The lack of gratitude by colleges makes the transition even more difficult and stressful for veterans seeking a college education. Combat2College (C2C) was created as a comprehensive yet efficient and quite inexpensive intervention program that addressed the stresses experienced by veterans returning to college. The core of C2C is an ongoing, “seamless” collaboration between a Department of Veterans Affairs (VA) medical center and a community college to support college success for OEF/OIF veterans. The C2C program was first offered at Montgomery Community College in Montgomery County, Maryland. C2C provides substantial and comprehensive services to faculty, staff, and students, yet remains efficient and simple because it centers on making small adjustments to existing college activities and resources and leverages existing relations with VA clinical services. The mission of C2C is to create a welcoming environment for all veterans and active duty reserve members of the armed forces by assisting them in adapting the skill set developed from military training and combat experience to facilitate a successful college experience.

C2C provides services for all OIF/OEF veterans, disabled or not. Everyone is eligible for the program and individuals pick and choose parts that interest them. To help reduce stigma, the program is not titled or treated as a program for people who are sick. C2C focuses on how the military experience gives veterans the skills, abilities and leadership to be successful students and have successful lives. The objectives of Combat2 College are: inclusiveness, removal of stigma, respect and appreciation, identification of resources and camaraderie, wellness and maximum feasibility. To achieve the goal of inclusiveness, C2C emphasizes primary prevention to facilitate academic success for all OIF/OEF veterans, disabled or not. This is crucial because many veterans with post-combat adjustment difficulties will not readily admit to any problems. Designing methods to include and provide benefit to this



**Joseph Bleiberg, Ph.D.**



large but silent group of veterans has been quite challenging, but essential. In keeping with the objective of serving all veterans, it has been essential to de-stigmatize the program. This is accomplished by identifying how military experience and training are positive assets that can be channeled towards the formation of adaptive and productive attitudes and behaviors to promote success in college. It is difficult to quantify the benefit veterans receive from entering a college environment that conveys respect and appreciation, but there can be no question of its immense value. A key element of the program is early communication of "thank you for your service" and "welcome home" typically before the veteran starts classes, often and from multiple sources. In C2C, education regarding available resources begins prior to the veteran starting classes and most importantly, does not wait until there is a crisis. The availability of the resources is disseminated to all veterans, not just to those singled out as being in need. C2C includes numerous formal and informal ways for veterans to find each other. All are devoid of stigma and integrated within traditional college activities and courses. These opportunities to connect with other veterans help to remove any distress or discomfort typically felt by veterans who return to school after being in the service. C2C works to promote optimal recovery from the "wear and tear" of combat and views college as a therapeutic community that promotes, rather than retards, healing. To achieve the objective of providing maximum feasibility, C2C has a "small footprint" on existing college programs and the services. Through utilizing existing resources, such as courses already within the curriculum, and making small adjustments to enhance relevance and usefulness to veterans, C2C is able to remain flexible in its goal to serve all the veterans enrolled at the college.

C2C demonstrates that it is possible to create a "veteran friendly" college using efficient and inexpensive interventions. The interventions do not disrupt the activities of the college, rely heavily on existing resources and essentially have a small and non-disruptive footprint. While veterans with mental health problems so severe as to prevent effective college participation without assistance are served, the program addresses and seeks to provide a benefit to all veterans, even those who deny or refuse to identify themselves as being in difficulty or needing services. Lastly, while the program is realistic regarding combat-related psychopathology, it also assists the student to self-explore ways in which military training and combat experience can be a source of strength and can be channeled towards facilitating success.

### **TRAUMA-CAUSED ISSUES: HOW TO RECOGNIZE AND HELP AFFECTED JOB SEEKERS**

*Ms. Carol Boyer, Policy Advisory, Workforce Systems, Office of Disability Employment Policy, U.S. Department of Labor*

- The Office of Disability Employment Policy (ODEP) provides national leadership on disability employment policy
- America's Heroes at Work aims to increase awareness of TBI/PTSD employment issues among employers and raise awareness of resources that assist employers with accommodations for transitioning service members and veterans with TBI/PTSD

The Office of Disability Employment Policy (ODEP) provides national leadership on disability employment policy by developing and influencing the use of evidence-based disability employment policies and practices, building collaborative partnerships and delivering authoritative and credible data on employment rates of people with disabilities. Authorized by Congress in the Department of Labor's FY 2001 appropriation, the ODEP recognizes the significance of fully integrating individuals with disabilities into the 21st century workforce. America's Heroes at Work, an initiative of ODEP, began two years ago and targets veterans with PTSD and TBI from OEF/OIF conflicts, as well as employers. Nearly one in five veterans of these conflicts has depression and/or stress disorders. Approximately 20 percent of troops say they might have experienced a TBI, usually as a result of a powerful roadside bomb. A federal, collaborative effort has been initiated to help these service members and veterans with TBI/PTSD succeed in the workplace.



**Ms. Carol Boyer**

America's Heroes at Work aims to increase awareness of TBI/PTSD employment issues among employers, the workforce development system, service branches, key military support systems, veterans' service organizations and one-stop career centers. The program also aims to create and raise awareness of resources that assist employers with accommodations for transitioning service members and veterans with TBI/PTSD. For many people experiencing mental health issues, the stigma can be worse than the illness. Stigma can stop people from self identifying, as they may be afraid of how they will be perceived and treated. As a result, mental health issues are often revealed in the workplace only when a crisis occurs. One in four Americans experiences mental health impairment each year and between two-nine percent of American adults has PTSD compared to 15-30 percent of veterans.

While TBI/PTSD symptoms can cause difficulties as service members transition to civilian life, employment can play a significant role in recovery. However employers believe many myths about TBI/PTSD including: 1) all TBIs are severe, 2) veterans with PTSD will be violent in the workplace, 3) job accommodations are complicated and expensive and 4) legal responsibilities are associated with hiring veterans. Employers need to be adequately informed about TBI and PTSD and receive training on how to assist veterans with TBI and PTSD in their transition to civilian employment. Employers can use good management practices, such as allowing flexible work environments and assistive technology when appropriate, to provide reasonable accommodations for individuals with disabilities, increasing natural lighting, providing memory aids, encouraging the use of stress management, providing a mentor or job coach to help employees dealing with these issues, and offering regular disability awareness training for managers and staff.

### DEPARTMENT OF DEFENSE YELLOW RIBBON PROGRAM OVERVIEW

*Mr. Glen Welling, Jr., Executive Director, DoD Yellow Ribbon Reintegration Program*

- The Guard and reserve make up nearly half of the armed forces with nearly 94,000 service members currently on active duty
- The Yellow Ribbon Program actively works to deliver effective, timely and uniform inter-service support to service members and their families throughout the deployment cycle, regardless of service affiliation or location

Guard and reserve members make up nearly half of the total U.S. Armed Forces. More than 791,000 reserve component service members have been called to active duty since 9/11, with more than 94,000 Guard and reserve members currently on active duty. The Yellow Ribbon Program (YRP) was developed to bridge a gap between support opportunities offered to the active components and the National Guard and reserve during the deployment cycle. The YRP diminishes that gap by providing members and their families with a wide range of information, services, referrals and proactive outreach opportunities throughout the deployment cycle. The YRP actively works to deliver effective, timely and uniform inter-service support to service members and their families throughout the deployment cycle, regardless of service affiliation or location. The YRP office has liaison officers from each of the services and one from the VA to provide responsiveness and assist in policy development, enhancing and facilitating joint collaboration across the services.

The YRP includes preparing for deployment and ultimately reintegrating a service member upon his or her return. Working in line with the deployment cycle, YRP places an increased emphasis on post-deployment and the reintegration phase by providing services that are typically available on an installation to service members. The core of the YRP is the yellow ribbon events. Yellow ribbons events occur at 30, 60, and 90 days post- deployment. For the most part,



**Mr. Glen Welling, Jr.  
Ms. Carol Boyer**



service members and their families attend events together. The program does not limit "family" to just spouse and dependent family members; family is defined as "whoever is best suited to support the service member." While the service members are deployed, the YRP works collaboratively with family readiness groups to bring the families together. Commanders, leaders and family organizations play a critical role in assuring that reserve members and their families attend yellow ribbon events.

During 2010, nearly 2,000 events were held in the United States. The YRP ensures easy access to our reserve components and their families where they live. Events are typically two days long where service member and "families" come together before deployment. In the future, the YRP will be focusing on the following initiatives: improved outreach; suicide prevention with focus on resilience; and increasing the cadre of speakers for yellow ribbon events.

## SESSION II: ACUTE BREAKOUT SESSION

### EFFECTS OF COMBAT DEPLOYMENT AND SOLDIER DISTRESS ON PARTNER WELL-BEING IN NATIONAL GUARD FAMILIES

*Christopher Erbes, Ph.D., Minneapolis VA Health care System; University of Minnesota Medical School*

- National Guard soldiers are being deployed at higher rates than ever before, placing a strain on families who are unused to the burdens of deployment
- National Guard families do not live on military installations, meaning they lack the constant support network of families undergoing similar stresses

The current military operations in Iraq and Afghanistan have placed an increased focus on service members and their families. A new reality of these wars is the operational nature of the reserve component (RC), comprised of the National Guard and the reserves. The RC has faced an unprecedented level of deployments compared to past wars, rotating regularly between combat zones and civilian life. There are certain demographic factors about the RC that make this new reality additionally challenging, such as reservists are typically older and married with children when compared to the active duty force. Additionally, they have civilian jobs and career aspirations, which are stressful to manage when deploying for extended periods of time. Since reservists do not live on military installations in their civilian lives, they often face difficulties with re-deployment and reintegration into post-combat life. Many National Guard men and women and reservists struggle with employment, social support and access to health care.

Families of National Guard soldiers, one of the most heavily deployed components of the reserve, have borne a high cost for the increased deployments. Families are a key source of support for soldiers, but many of those families have little exposure to the military prior to a soldier deploying and often cannot cope with the stressors of the deployment as well as an active duty family. Deployments have been linked to increased mental health service utilization amongst spouses, as well as increased internalizing and externalizing disorders among children, and increased reporting of child maltreatment. Service members who return home with PTSD often have reduced relationship satisfaction and poorer parenting practices.

To combat the difficulties experienced by returning reservists, the Defense Department and other supporting organizations have launched the Readiness and Resilience in National Guard Soldiers (RINGS) Project, which aims to identify protective and vulnerability factors for soldier and family mental health following deployments. Working with the Minnesota and Iowa National Guards, this longitudinal and multi-informant design studies how couples deal with PTSD. Additionally, a family well-being study is being conducted. Results of the first study indicated that PTSD is associated with deteriorations in soldier and partner rating of relationship adjustment and that service support for family members is important to mitigate this factor. The second study concluded that rates of depression and impaired social functioning are elevated prior to combat deployments. Likewise, the distress experienced by soldiers directly influenced distress experienced by partners and families.



These studies indicate that the stresses of deployment heavily impact National Guardsmen and families. It is evident that support services may be very important for these populations of soldiers and family members who live away from military installations and do not currently have ample access to support. As the studies continue, additional information will be revealed and care will continue to improve for these National Guardsmen and their families.

### **FAMILIES OF RURAL OEF/OIF VETERANS WITH TRAUMATIC BRAIN INJURY: CONCERNS AND ISSUES**

*Ms. Chrystal Snyder, Ridgewood: Ingenious Communication Strategies for Arizona Governor's Council on Spinal and Head Injuries*

- Many soldiers, both active duty and reserve component, live in rural areas removed from top-notch medical care
- Returning from combat with a TBI is even more difficult when one's home lacks adequate care, forcing one to forgo the best treatment or live far away from home at a rehabilitation center
- The military must develop a solution to this problem. Telehealth, leveraging online and telephone resources to reach patients outside of the geographic reach of treatment facilities, offers a promising tool for the affected populations to receive high-quality care in their homes

The physical, mental and emotional challenges following a traumatic brain injury (TBI) are daunting, even under the best conditions of care. When service members who live in rural areas sustain TBI, the challenges are even more severe due to poor access to health care. For instance, Arizona's service member and veteran demographics indicate that of the 20,000 active duty service members, half are based in rural areas. The 13,000 reserve component (RC) soldiers in Arizona include 1,746 combat veterans from rural counties.

TBI victims who live in heavily-populated areas or near a military treatment facility can access multidisciplinary medical and rehabilitation teams and TBI experts. TBI victims who live in rural areas typically only have access to generalists who wear many hats, leaving gaps in necessary specialties. Therefore, living in a rural area and being farther away from centers of care can lead to the following challenges for TBI victims: 1) higher health care costs due to scarcity, 2) quitting or losing a job over time needed for care, 3) children's needs becoming secondary, 4) social isolation and 5) fewer specialized medical services in the areas.



**Ms. Chrystal Snyder**

Without access to proper care in these rural areas, the stressors placed on the family are exacerbated.

As a family experiences difficulty when coping with a TBI without proper care, the individual with the TBI can develop more severe symptoms, as a result of stress. These families need access to increased and better resources, ranging from clinical resources, to vocational and educational assistance, to links to the community of TBI victims. Many online resources are emerging, including BrainLine.org, DVVIC.org,

TraumaticBrainInjuryAtoZ.org and BrainTrauma.org. These resources are instrumental in connecting rural service members and veterans dealing with TBI to the proper resources.



### TELEMEDICINE AND TELEREHABILITATION IN POLYTRAUMA

*Kathleen R. Bell, M.D., Professor, Department of Rehabilitation Medicine, University of Washington*

- Many service members and veterans live far away from medical facilities that offer the type of care needed, especially in the instances of TBI and polytrauma
- Telehealth, leveraging new technologies to increase reach of care, offers promising results for helping TBI patients and families readjust to life at home

The field of telehealth has risen to prominence with the rise in number of service members and veterans living with long-term injuries and health conditions as a result of operations in Iraq and Afghanistan. Defined as the use of electronic technology for patient care, monitoring and education, telehealth utilizes telecommunication technologies, such as the internet, to provide, enhance or expedite care. Telehealth particularly benefits the reserve component service members who often live far away from military installations by allowing the medical community to further increase the quality of care for service members and veterans in geographically-dispersed areas.

For injuries such as a TBI, the transition from the hospital to home can be daunting. Consequences of the injury are realized in new ways as a family tries to regain a routine and the stresses of everyday life return. This leads to the possibility of individuals forgetting essential medical necessities, such as taking medicine or attending regular physical therapy sessions. Furthermore, access to in-person care is very limited in many parts of the country. For instance, nearly half of the populations of Idaho and Montana are rural, as is one quarter of the population of Washington. Wyoming only has two acute rehabilitation centers; the city of Juneau, Alaska, has no adult speech pathologist; and Washington only has one TBI program.

The lack of access to care for those in rural communities has spurred this telehealth revolution. With near-universal access to telephones, and well over half of households equipped with the internet, providing access in new ways is now possible. A Department of Veterans Affairs program in telehealth demonstrated that not only can these programs assist in chronic disease and health management, but they are very cost effective. The annual cost per patient is only \$1600 for the telehealth option, which is significantly lower than a year of in-person care. Another study analyzed whether telehealth was effective at ameliorating depressive symptoms in the year following a TBI. The study revealed that the group receiving regular telephone care had lower rates of severity of depression than did the control group, indicating that this could be an effective method of care for those without geographic access to regular care. However, telehealth programs are difficult to implement, as studies have revealed that telephone management requires successful targeting of specific populations, as well as training the caregivers on specific phone techniques.

The demand for telemedicine and telerehabilitation options for TBI and polytrauma victims is great, as is the need to improve the care. Currently, only 44 percent of patients with mild depressive disorder in the year following a TBI are receiving treatment. Likewise, many TBI patients prefer telephone or in-person counseling over antidepressant medication.

The National Center for Telehealth & Technology is leading the way in developing innovative telehealth options for improving care. They indicate that tools such as web-based interactive care and live video chats are effective because they reduce the stigma associated with seeking psychological care and they can link patients across the country to discuss their conditions with other patients. Additionally, the trajectory of growth for mobile phone internet use indicates that by 2013, this will be the primary way that individuals will access the internet. This data has prompted the development of mobile phone applications that offer telemedicine and telerehabilitation services to patients.

All of these options represent innovative ways to increase the reach of the medical community to offer better care to service members and veterans. In our contemporary operating environment, in which RC service members are regularly deployed, there is more of a demand for high-quality health care in rural areas. Leveraging new technologies is an effective way to do this, leading to higher quality of life and a healthier force ready to tackle the ongoing challenges of fighting multiple wars around the world.

## SESSION II: REHABILITATION BREAKOUT SESSION

### DoD/VA Vision Center of Excellence (VCE)

*Colonel Donald Gagliano, USA, M.D. MHA, Executive Director, DoD/VA Vision Center of Excellence*

- New cross-agency center designed to improve health and quality of life for service members relating to vision injuries
- Uses cutting-edge data registry tools to identify undiagnosed injuries based on certain concomitant diagnosed injuries

The DoD/VA Vision Center of Excellence (VCE) was created in the 2008 National Defense Authorization Act (NDAA), with the mandate to be a cross-agency center designed to leverage the Defense Department's resources. The intent of this center is to utilize these resources to better meet the needs of service members' ocular health as well as to spread information and findings to stakeholders throughout the Defense Department and VA. The VCE tracks ocular injuries from blast, ballistic and concussive injuries and tracks clinical findings and current research efforts to better understand the association of trauma and vision loss. The spectrum of ocular health covered in VCE spans from pre-occurrence of an injury through rehabilitation and the point of last intervention. The VCE's mission is to continuously improve health and quality of life for members of the armed forces and veterans through assessment, validation, oversight, identification, advocacy and leadership for the prevention and treatment of vision injuries. The functional areas of this mission statement are: 1) knowledge development and dissemination, 2) clinical care, 3) data quality management and 4) research coordination.



**Colonel Donald Gagliano, USA, M.D.**  
**Lieutenant Colonel Mark Packer, USAF**

A primary goal of the VCE is to identify service members who have suffered eye injuries without proper identification or treatment. Employing a data registry to observe patterns in patients over time, the VCE is able to compare many variables in unique ways that cannot be done in randomized clinical trials. For instance, it is known that a patient suffering from a lower extremity amputation most likely has eye injuries or eye problems, even if it is initially undiagnosed. The capabilities of the data registry allow the military to identify and assist in the treatment of that service member based on the concomitant factor of the amputation.

The VCE's continuing priorities include: 1) prevention of eye and visual system trauma; 2) strategies for diagnosis, treatment and mitigation of traumatic and war-related injuries to the ocular structures and the visual system; 3) epidemiological studies to understand mechanisms of traumatic injury to the eye and visual system; 4) technology to enhance and restore visual function; and 5) ocular pain and sensitivity syndromes.

### HEARING CENTER OF EXCELLENCE (HCE)

*Lieutenant Colonel Mark Packer, USAF, MC, FS, Interim Director, Hearing Center of Excellence*

- The Hearing Center of Excellence was created in 2010 to address hearing loss and audio-vestibular injuries approaching one billion per year in health care costs
- The Hearing Center of Excellence leverages data sharing across the Defense Department and VA to provide better care and more comprehensive and innovative data studies

The Hearing Center of Excellence (HCE) was established in May 2010 as a Defense Department center focusing on hearing loss and audio-vestibular system injuries. The Air Force has been designated as the lead with the headquarters located at Wilford Hall Medical Center, Lackland Air Force Base, Texas.

The HCE is a collaborative, integrated effort between the Defense Department and Department and VA which is focusing on a decentralized, virtual approach, maximizing leveraged assets across both departments. The virtual approach to the HCE demands reduction on infrastructure, thereby allowing the center to develop a more effective joint strategy. The HCE is necessary due to the large and increasing problem with noise-related injuries in the military. Almost all of our military aircraft have a higher decibel rate inside the cockpit than the technological limit of ear protection, meaning that hearing damage is an inevitable reality for aviators. As well, aircraft carrier decks push the military's technological limits for hearing protection.

The vision of the HCE is to fulfill America's commitment to all who support and defend our nation by serving as the nation's premier center for promoting excellence in the prevention, diagnosis, mitigation, treatment and rehabilitation of hearing loss and audio-vestibular system injuries for members of the armed forces and veterans. The HCE heightens readiness and continuously improves the health and quality of life for service members and veterans through advocacy and leadership in the development of initiatives focused on prevention, diagnosis, mitigation, treatment, rehabilitation and research.



**Lieutenant Colonel Mark Packer, USAF**

The HCE is establishing a data registry to allow for incidence and outcome analysis, leading to a longitudinal study assessing outcomes, intervention strategies and standards of care. By facilitating data sharing between the Defense Department and VA, the HCE will improve patient care for the transition from Defense Department health care to VA health care, as well as enabling long-term observation and study throughout a patient's life, not just the time in one health care system.

With 2009 compensation levels for hearing loss approaching one billion, and compensation for the condition tinnitus topping \$900 million, the cost of hearing loss and audio-vestibular injuries is large and growing. The HCE has set out to mitigate this problem and improve hearing-related health care for service members and veterans.

### **TRAUMATIC EXTREMITY INJURIES AND AMPUTATION CENTER OF EXCELLENCE (EACE)**

*Colonel (Ret.) Charles Scoville, DPT, Interim Director, Traumatic Extremity Injuries and Amputation Center of Excellence*

- Extremity Injuries and Amputation Center of Excellence will not be a brick-and-mortar center, but rather a system of excellence that connects necessary resources to providers

The Traumatic Extremity Injuries and Amputation Center of Excellence (EACE) is a congressionally-mandated organization currently being stood up to facilitate the continuous care and research related to traumatic extremity injuries and amputations across the Defense Department and Department VA multidisciplinary health care network.

Without a current concept of operations or full-time staff, the EACE is in a preliminary organizational design phase. The center does not intend on becoming a brick-and-mortar "Center of Excellence" but rather a system of excellence, connecting the necessary resources around the country to the right providers. The director of the center, Dr. Charles Scoville, says that the "center of excellence is wherever a patient and provider are, as that is where the excellent treatment needs to occur." The EACE will serve as the facilitator of these interactions.

## SESSION II: REINTEGRATION BREAKOUT SESSION

### VA COMPENSATED WORK THERAPY: EMPLOYMENT SERVICES AND OUTCOMES

*Sandra G. Resnick, Ph.D., VA VISN MIRECC; Yale University School of Medicine*

- The Department of Veterans Affairs is evaluating compensated work therapy (CWT), a part of the Veterans Health Association (VHA) Mental Health Services, providing vocational rehabilitation for veterans with psychiatric disabilities
- Two major components of compensated work therapy are transitional work and supported employment

Employment can be an essential part of a veteran's recovery as it facilitates community reintegration and provides a normative role in society. There are two broad ideologies of vocational services, each on opposite poles of a continuum: 1) work as therapy and 2) work as work. The goal of programs that are aligned with the philosophy of work as therapy is to create work situations as a means of providing therapy during recovery. These positions are designed to serve as a distraction from symptoms, improve self-esteem through accomplishments and may or may not lead to competitive work. The work as work ideology focuses on helping those with mental health disorders to seek integrated jobs with regular wages in the marketplace. Vocational rehabilitation programs sit along this continuum, sometimes incorporating aspects of both.

The VA is evaluating compensated work therapy, a part of the VHA mental health services, providing vocational rehabilitation for veterans with psychiatric disabilities. Currently, there are 169 CWT programs throughout the United States, providing several types of services. Supported employment is an evidenced based practice for individuals with psychiatric disabilities, assisting them in getting real jobs in the community. One of the many principles of supported employment is "zero exclusion," which means that individuals cannot be turned away from programs due to active symptoms or substance abuse.

Another major component of CWT is transitional work. Typically, positions associated with CWT transitional work are established for a specified time period and pay minimum wage. The defining feature of the transitional work component of the CWT program is that the program itself secures the job and serves as an intermediary between the employer and the veteran.

NEPEC began a national program evaluation of the CWT program in 1993. Electronic data collection began in 2006, securely collecting veteran-level process and outcome data at admission, quarterly and at discharge. NEPEC also examines fidelity of supported employment programs for veterans with psychotic disorders. Fidelity refers to how well a particular program is adhering to a defined model. Data indicates that the number of discharges from the CWT programs have been steadily increasing over time, with 11,272 discharges from the CWT program in FY10.

Previous research on the CWT program indicates that a programmatic emphasis on assertive outreach, in which staff members aggressively work to engage with veterans who may be interested in employment but reluctant to engage in services, is associated with higher rates of competitive employment outcomes at discharge. Prior studies have also found that veterans with PTSD are 19 percent less likely to be employed at



**Sandra G. Resnick, Ph.D.**



discharge from CWT than veterans without PTSD.

Program evaluation data indicate that of the 34,237 individuals enrolled in the NEPEC CWT program evaluation between fiscal years 2006 - 2009, 94 percent were male. Of these participants, 49 percent were white and 46 percent were black. Upon entering the program, the majority of individuals were from the Vietnam and post-Vietnam eras, had been previously married but not currently married, and were homeless at program entry. Half of the participants were receiving benefits or entitlements and 78 percent had a diagnosis of substance abuse or misuse. Approximately 15 percent had a diagnosis of PTSD, 7 percent were diagnosed with TBI, and 75 percent had neither. Veterans with PTSD, TBI, or both, had significantly lower rates of competitive employment at discharge than those with neither diagnosis. Currently there are randomized clinical trials by VA investigators examining the effectiveness of supported employment for individuals with PTSD and TBI.

### **TRANSITION ASSISTANCE ADVISOR PROGRAM: STATE COALITIONS FOR COMMUNITY REINTEGRATION**

*Major General (Ret.) Marianne Mathewson-Chapman, USA, Ph.D., ANP, Veterans Health Administration OEF/OIF Outreach Office*

*Dr. Christine Elnitsky, Ph.D., RN, CHNS, Veterans Health Administration HSR&D/RR&D Center of Excellence, James A. Haley Veterans Hospital*

- The Transition Assistance Advisor (TAA) program is a national partnership of National Guard and VA
- A study of TAA State Coalitions for Community Reintegration has been proposed to explore state level coalitions established by the TAA program to facilitate reintegration of OEF/OIF service members, National Guard and reserves

Coalitions integrate the delivery of services and reduce duplication of effort. The Transition Assistance Advisor (TAA) Program, a national partnership between the National Guard and VA, is a promising model for reintegration that has been highly touted in Congress. More than 50 percent of the OEF/OIF population was comprised of service members from the National Guard and reserves, with many hailing from small towns and rural communities. These communities may lack the supporting infrastructure of military bases (medical, psychiatric, support personnel) and familiarity with benefits and entitlements earned. These combat veterans need access to many of these services in order to properly reintegrate. Consequently, the mission of the TAA program is to maximize knowledge of and access to services for reintegration by developing state coalitions to coordinate community services to meet the needs of National Guard/reserve members, veterans and families. By implementing a proactive, veteran centric and results driven outreach approach, the VA is actively encouraging veterans to enroll in VA health care. The transition assistance advisors are the linchpins to connect the veteran and family to community services to facilitate their transition from the Defense Department to VA for health care and benefits. These advisors are trained by VA to refer veterans to services, such as counseling, education, health care rehabilitation and assistance with seeking employment. Many of these advisors are National Guard retirees and can relate to both the service members and their families.

The TAA State Coalitions Study has been proposed to explore state level coalitions established by the TAA program to facilitate reintegration of OEF/OIF service members, National Guard, reserves and their families. The aims of this study are to document national implementation and to increase our understanding of organizational factors that contribute to successful implementation and reintegration. Coalitions for reintegration "develop a continuum of care that has no gaps in service provision, whether in transition from



**Major General (Ret.) Marianne Mathewson-Chapman, USA, Ph.D., ANP**

the Defense Department to VA's health care system or in subsequent linkages...in the veteran's community" (NAPA: 2008, p.16). Coalitions include an alliance of diverse organizations (public, private, non-profit, voluntary) building their communities' capacity to meet the needs of the veteran population, including health care, education, employers, housing and transportation. Many factors contribute to the success of a coalition including: 1) internal coalition functioning and external community changes, 2) leadership style and governance, 3) diverse coalition membership, 4) collaboration and cohesion, 5) cultural competence (e.g., military and veteran culture) and 6) communication, outreach, and negotiation. Findings from the TAA State Coalitions Study will demonstrate how best to implement coalitions to maximize reintegration outcomes of returnees and their families.

### TRANSITIONAL LIVING FOR POLYTRAUMA/TBI VETERANS - "SMART HOME"

*Jan Jasiewicz, Ph.D., Assistant Director, Research Labs, James A. Haley Veterans' Hospital, Research Center of Excellence*

*Steve G. Scott, D.O., Medical Director of Polytrauma Rehabilitation Center, James A. Haley Veterans' Hospital*

- The "Smart Home" is based on pervasive technologies, which is a machine-person interface that is designed to change individual's behaviors
- The program provides cognitive rehabilitation (attention, memory, etc.) and self-instructional strategies through computer monitoring systems



**Jan Jasiewicz, Ph.D.**

The "Smart Home" concept generated from a patient-centered aligned home and can be built on the foundation for those that have TBI, injuries or other issues. In addition to the many warriors surviving severe injuries with severe trauma, there is an increasing number of service members experiencing invisible wounds who require care. It is necessary to explore new means to rehabilitate a new generation of injuries. When a service member is injured in combat, there is an established pathway that they follow until they ultimately arrive at a VA polytrauma rehabilitation center of care. An individual's emotional, cognitive and behavioral indicators will dictate the extent of the rehabilitation required. While acute needs diminish quickly, challenges in cognition and emotional functioning remain a problem.

The VA Polytrauma Transitional Rehabilitation Program utilizes an interdisciplinary team approach where individuals reside at apartment living facilities. Over the past 10 to 20 years, there has been a paradigm shift in rehabilitation to focus on this smart home concept. People stay in this home-like environment for anywhere from several months to a year, focusing on successfully reintegrating into society. The program provides cognitive rehabilitation (attention, memory, etc.) and self-instructional strategies through computer monitoring systems. The home fully integrates pervasive technology based on real time tracking that is intelligent and interactive. The "Smart Home" provides and delivers constant cognitive rehabilitation to the affected group.

Technology has the ability to make a significant difference to veterans and spillover to civilian communities. The "Smart Home" is based on pervasive technologies, which is a machine-person interface that is designed to change individual's behaviors. To be successful, it must be modifiable and sustainable. The "Smart Home" employs infrared lasers, pulse monitors, and other sensors to monitor behavior sequences. Users will be prompted if they "stray" to go back and complete the sequence properly. The prompts are similar to those located in the Google advertising bar, but have the ability to know where an individual is and guess what they are going to do next.

The "Smart Home" is based on ultra, white band frequency, where the sensors are placed throughout the individual's "home" and the person wear tags, such as an ID or watch. Radar can track an individual up to six inches in accuracy. A measure called FractalID is used to track the cognitive functioning of an individual over a year long period by capturing movement variability related to cognitive functioning.



It is necessary to leverage the proliferation of interactive technologies. Veterans regain memory of how to use mobile phones very early because it is basically an ingrained behavior. Technology is an ally that augments clinical care but does not replace it. The "Smart Home" will continue to be utilized as a nucleus for collaborative research; it is currently the only interactive smart home in the world.



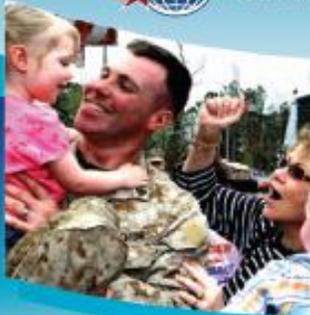
## CONCLUSION

This Trauma Spectrum Conference Technical Summary for 2010 was developed from presentation slides and notes taken during the conference. Thus, it reflects the summarized content of the conference to the best extent possible. If there are questions about the content, please contact the sponsor POCs for any questions or additional information.

*The views contained in the conference proceedings are those of the respective speaker and are not to be construed as the views of the Defense Department, the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, the National Institutes of Health, or the Department of Veterans Affairs.*



**DEFENSE CENTERS OF EXCELLENCE**  
FOR PSYCHOLOGICAL HEALTH & TRAUMATIC BRAIN INJURY



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