Acute clinical care and care coordination for traumatic brain injury within Department of Defense
Michael S. Jaffee, MD, et al.

The nature of current combat situations encountered by U.S. military forces has dramatically increased the risk of traumatic brain injury (TBI) in military personnel. While TBI may result in physical impairment, often the more problematic consequences involve the individual’s cognition, emotional functioning, and behavior. These consequences can affect all aspects of a person’s life, including the development or maintenance of interpersonal relationships and the ability to function in employment settings. This article summarizes the systems of care available for the management of TBI from point of injury to the transition to the Department of Veterans Affairs treatment facilities. We describe TBI assessment, treatment, and overall coordination of care for patients with TBI, including innovative clinical initiatives used during current conflicts. This information was drawn from multiple efforts to rapidly identify persons with TBI and provide comprehensive treatment toward recovery.

Infectious complications in OIF/OEF veterans with traumatic brain injury
Birgitt Dau, MD, et al.

Military personnel serving in Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) are at risk for infections related to traumatic injuries or infections that are endemic to the host country. This article reviews these infections, which include infections with drug-resistant bacteria such as *Acinetobacter* and methicillin-resistant *Staphylococcus aureus*, as well as leishmaniasis, malaria, diarrheal illnesses, and sexually transmitted infections. We also report on infections in OIF/OEF veterans in the polytrauma unit at the Department of Veterans Affairs Palo Alto Health Care System. This information will help medical personnel caring for OIF/OEF veterans presenting with infectious diseases.

Posttraumatic epilepsy and treatment
James W. Y. Chen, MD, PhD, et al.

After a head injury, epilepsy could develop as a late complication. When injury is severe, the likelihood of epilepsy developing is high. After a penetrating head injury, epilepsy could occur in 53% of patients. With a mild injury, such as a concussion, the chance of developing epilepsy is around 1%. The potential downside of...
epilepsy is dreadful. Car accidents, physical injuries, drowning, and aspiration could occur during seizures. Over time, seizures might become difficult to control, and patients could find daily life hard to cope with. Early diagnosis and treatment are important for patients to lead productive lives.

**Prevalence of chronic pain, posttraumatic stress disorder, and persistent postconcussive symptoms in OIF/OEF veterans: Polytrauma clinical triad**

Henry L. Lew, MD, PhD, et al.

Pain, posttraumatic stress disorder (PTSD), and persistent postconcussive symptoms (PPCS) are problems often experienced by returnees of Operations Enduring Freedom and Iraqi Freedom. To determine how often soldiers were reporting these conditions, we collected information from 340 returning veterans at a Polytrauma Network Site. Our results indicated that these three problems (pain, PTSD, and PPCS) are highly prevalent. Moreover, these three conditions most often occur in combination with one another (42.1%), rather than in isolation. Our results suggest that healthcare providers across different disciplines need to work together and be aware of the ways that these conditions can interact.

**Veterans with history of mild traumatic brain injury and posttraumatic stress disorder: Challenges from provider perspective**

Nina A. Sayer, PhD, et al.

Veterans are returning from the wars in Iraq and Afghanistan with both traumatic brain injury, which is most often mild (mTBI), and posttraumatic stress disorder (PTSD). We interviewed 40 Department of Veterans Affairs providers across the United States who treat these veterans to learn about the challenges they face and to identify opportunities for quality improvement. Findings point to the need for guidance on best practices for assessment and treatment of patients with both mTBI and PTSD, improved systems to coordinate or integrate services, improved patient and provider education, and research to build the evidence base for practice. Providers also believed that patients who have a history of mTBI and current PTSD often have other problems that require specialized treatment, including pain and sleep disturbance.

**Advances in neuroimaging of traumatic brain injury and posttraumatic stress disorder**

Robert W. Van Boven, MD, DDS, et al.

Improved diagnosis and treatment of traumatic brain injury (TBI) and posttraumatic stress disorder (PTSD) are needed. Nearly one out of every five Operation Iraqi Freedom/Operation Enduring Freedom servicemembers (300,000) suffers from symptoms of PTSD or depression and 320,000 may have sustained TBI (mostly mild). Although most patients with mild TBI recover fully, a significant number have persistent problems with memory, concentration, irritability, and headaches. In mild TBI, usual brain images do not show abnormalities. This article reviews advanced imaging studies aimed at better detecting brain changes that may help us understand and treat patients with TBI and PTSD.

**Neuropsychiatric diagnosis and management of chronic sequelae of war-related mild to moderate traumatic brain injury**

Joshua D. Halbauer, MD, et al.

Soldiers who have had a head injury can have mental symptoms grouped as (1) thinking problems: difficulties with memory, attention, talking, vision, and/or making decisions; (2) behavior problems: depression, mania, anxiety, sleep problems, and loss of interest in sex; (3) sensory losses: impaired smell, sight, and hearing; (4) physical complaints: headache and chronic pain; and (5) drug dependence. Mental problems are common in veterans who have been in recent Middle East conflicts and have had head injuries, but these problems can be missed with modern
tests. Using an organized approach, clinicians can find and manage symptoms of mild to moderate head injuries.

**Auditory and vestibular dysfunction associated with blast-related traumatic brain injury**
Stephen A. Fausti, PhD, et al.

The increase in blast exposure in recent military conflicts has led to a surge in traumatic brain injury (TBI) and associated auditory damage. Auditory dysfunction has become the most common individual service-connected disability, and damage from blast exposure can cause many different types of problems. These problems are particularly challenging in patients with TBI because symptoms can be mistaken for posttraumatic stress disorder and mental health or cognitive issues. Auditory assessment tools must be developed and used by a multidisciplinary team to assess the auditory system. A comprehensive evaluation must be completed in polytrauma patients to ensure that all injuries are accurately diagnosed and appropriate rehabilitation can be devised. Effective treatment and hearing loss protection programs can also reduce the potential for the medical and socioeconomic consequences of hearing loss and ultimately allow patients to retain a better quality of life.

**Eye and visual function in traumatic brain injury**
Glenn C. Cockerham, MD, et al.

Combat blast injury is a common cause of traumatic brain injury and injuries to other areas of the body. Awareness is increasing about the potential effects of blasts on the eye. Important aspects of visual functioning, such as the ability to see objects in lighted or dark environments, color vision, and awareness of the visual space around us (visual fields), may be affected by either the blast or the resulting brain injury. Efforts are underway in military and Department of Veterans Affairs centers to better understand and treat eye and vision damage from blast and to rehabilitate injured veterans.

**Auditory and visual impairments in patients with blast-related traumatic brain injury: Effect of dual sensory impairment on Functional Independence Measure**
Henry L. Lew, MD, PhD, et al.

Recent studies found that hearing and vision impairments appear to be common in troops incurring polytraumatic injury while serving in Iraq and Afghanistan. Hearing and vision are the major communication channels between people and are the primary guides for functioning within our environment. We examined records of patients in a Department of Veterans Affairs Polytrauma Rehabilitation Center to study the affect of auditory, visual, and dual sensory impairment (DSI) on recovery as assessed by the Functional Independence Measure. DSI was associated with a poorer outcome. Our findings suggest a need for better rehabilitation strategies to improve functioning in cases of DSI.

**Insomnia in the context of traumatic brain injury**
Jamie M. Zeitzer, PhD, et al.

Large numbers of active-duty soldiers and veterans have experienced an injury to the brain known as a traumatic brain injury (TBI). Doctors have found that insomnia or trouble sleeping often accompany TBI and that sleep problems often worsen many of the mental (e.g., depression) and physical (e.g., pain) problems that accompany TBI. Poor sleep can also slow brain healing and TBI recovery. This article examines the treatment of sleep problems connected with TBI.

**Sleep apnea, apolipoprotein epsilon 4 allele, and TBI: Mechanism for cognitive dysfunction and development of dementia**
Ruth O’Hara, PhD, et al.

This article provides an overview of the literature on traumatic brain injury (TBI) and sleep apnea. We present evidence to suggest that these factors in combination with
the presence of the apolipoprotein epsilon 4 allele may contribute significantly to cognitive dysfunction and the development of dementia. Because the majority of sleep apnea patients are male and TBI is common among veterans because of combat and other factors, this work has significant importance for the Department of Veterans Affairs.

Pharmacological management of neurobehavioral disorders following traumatic brain injury—A state-of-the-art review
Effie Chew, MD; Ross D. Zafonte, DO

Neurological problems such as problems with arousal, attention, memory, and behavior are common after traumatic brain injury (TBI). Medications are often used to enhance function, memory, and behavior. However, the research supporting this use is scant. This review summarizes the state of our knowledge in prevention of secondary neurological damage, drug treatment of low arousal states, attention and memory problems, aggression, agitation, and mood disorders following TBI. We further recommend the direction of future research, which includes further defining the specific characteristics of patients who will benefit from specific treatments, the time course of treatment, and combination therapy.

Families of patients with polytrauma: Understanding the evidence and charting a new research agenda
Joan M. Griffin, PhD, et al.

Families of U.S. servicemembers with polytrauma (which often includes a traumatic brain injury) will likely face significant stress as their injured family member begins to recover and rehabilitate from these complex injuries. However, little knowledge exists about what families need during polytrauma recovery and rehabilitation and how they will cope over time. We describe what is currently known about the families’ role in the recovery and rehabilitation process and the families’ ongoing and long-term needs. We also summarize different ways that families respond to stress and the long-term effects of patients’ injuries. We conclude with suggestions for future research.

Minimizing the effect of TBI-related physical sequelae on vocational return
Shane McNamee, MD, et al.

Vocational return after traumatic brain injury is a challenging journey and arguably the most important outcome. A myriad of cognitive, behavioral, and physical issues typically affect successful vocational return. In reviewing the current literature, we found multiple reviews that deal with the cognitive and behavioral issues. This article was written to further shed light on how the physical deficits can affect recovery and to offer real-world solutions to minimize this impact.

Community integration: Current issues in cognitive and vocational rehabilitation for individuals with ABI
Paul Wehman, PhD, et al.

This article reviews the latest cognitive and vocational rehabilitation methods for returning individuals with acquired brain injury (ABI) to work and community participation. We intend this information to benefit these individuals’ clinicians and families during the reintegration and return-to-work processes. Special emphasis is placed on specific challenges for returning service members who have an ABI, particularly service members who are racial/ethnic minorities. Recommendations are made for return-to-work programs.