



**THE CENTER FOR
ETHICAL SOLUTIONS**
INNOVATIVE APPROACHES TO HEALTHCARE POLICY

QUICK FACTS ABOUT POSTTRAUMATIC STRESS DISORDER AND TRAUMATIC BRAIN INJURY

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Introduction

- There are two types of traumatic disorders that can occur in the course of military service: Traumatic Brain Injury (TBI) and Posttraumatic Stress Disorder (PTSD). TBI is injury to the brain from a trauma, such as an explosion, accident, fall, or assault. PTSD is an anxiety disorder that can occur after a person experiences, witnesses, or hears about a traumatic event. Please see below for a more detailed description of each type of condition. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010; U.S. Department of Veterans Affairs, “Understanding PTSD,” www.ptsd.va.gov)
- Armed forces in Afghanistan and Iraq are at increased risk of blast injuries because of the prevalent use of IEDs and other explosive devices. Advanced protective body armor allows survival of many of these blasts but does not prevent closed head injuries, so brain injuries can occur. (“Traumatic Brain Injury in the War Zone,” Okie S, *New England Journal of Medicine*, 5/19/2005, www.nejm.org)
- Traumatic brain injuries (TBI) are more common among our Afghanistan and Iraq war veterans. “The Department of Defense (DOD) and the Defense and Veterans Brain Injury Center (DVBIC) estimate that 22% of all combat casualties from these conflicts [in Afghanistan and Iraq] are brain injuries, compared to 12% of Vietnam-related combat casualties.” (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Posttraumatic stress disorder (PTSD) continues to be as serious a problem for American armed forces in Afghanistan and Iraq as it was in previous wars. PTSD is estimated to occur in 11-20% of Afghanistan and Iraq war veterans. (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)
- PTSD and TBI are distinct diagnoses that present with different but frequently overlapping symptoms. It can be difficult to accurately diagnose PTSD and TBI, but careful assessment is important because each condition benefits from its own specialized treatment. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic_brain_injury_and_ptsd.asp, reviewed/updated 9/16/2010)

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- Trained medical professionals can tell the difference between PTSD and TBI. And, appropriate treatment can help veterans with PTSD and TBI. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/public/pages/traumatic_brain_injury_and_ptsd.asp, reviewed/updated 6/15/2010)

What is Posttraumatic Stress Disorder?

- *Posttraumatic Stress Disorder* (PTSD) is an anxiety disorder that can occur after a person experiences, witnesses, or hears about a traumatic event. The anxiety is diagnosed as PTSD when it lasts for at least one month and makes it difficult for the person to function normally in everyday life. (U.S. Department of Veterans Affairs, “Understanding PTSD,” www.ptsd.va.gov; American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000)
- A traumatic event is a horrible and frightening incident during which the trauma survivor fears for his or her life or the lives of others and feels terror or helplessness. Examples of traumatic events that can cause PTSD include military combat, terrorist attacks, physical or sexual assault, child abuse, or even motor vehicle accidents and natural disasters. (U.S. Department of Veterans Affairs, “Frequently Asked Questions About PTSD,” www.ptsd.va.gov/public/pages/faq-about-ptsd.asp, reviewed/updated 6/15/2010; American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000)

What are the Symptoms of PTSD?

- There are four types of PTSD symptoms that can occur after someone survives a traumatic event. PTSD symptoms often develop soon after the trauma, but sometimes they can begin months or even years later. (U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)
- *Re-experiencing symptoms* are when the survivor re-lives the traumatic event by having distressing memories of the trauma, recurrent nightmares of the trauma, and/or feelings that the trauma is happening again. Sometimes, a sound, sight, or smell may trigger these re-experiencing symptoms and/or bring on emotional distress. (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000; U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)

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- *Avoidance symptoms* occur when the survivor avoids situations that could bring on memories of the trauma. Examples of avoidance symptoms are not watching television shows or news reports about the trauma, not wanting to talk about the trauma, not being able to remember part of the trauma, and/or not going to places or doing things that might bring back memories of the trauma. (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000; U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)
- *Numbing symptoms* are when the survivor feels emotionally distanced or estranged from others, has difficulty expressing feelings, does not have good feelings toward others, and/or is not interested in activities that were previously enjoyed or considered important. (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000; U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)
- *Hyperarousal symptoms* are when the survivor feels more jittery and on edge, angers more easily, has trouble sleeping, has trouble concentrating, startles easily when something unexpected happens, and/or feels on alert and on guard for danger. (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000; U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)

How Common is PTSD?

- In the general population, “about 60% of men and 50% of women experience at least one trauma in their lives” but not all traumas result in PTSD. (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)
- After a traumatic event, many people may have temporary post-traumatic symptoms, but most do not develop lasting PTSD. (U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)
- “About 7-8% of people will have PTSD at some point in their lives. Women are more likely than men to develop PTSD, [with] 10% of women developing PTSD sometime in their lives compared to 5% of men.” (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)

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- The occurrence of PTSD is higher among military service members than in the general population. It is estimated that 11-20% of Operation Enduring Freedom and Operation Iraqi Freedom veterans have PTSD, 10% of Gulf War veterans have PTSD, and 30% of Vietnam War veterans have PTSD. (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)

How Likely is it for PTSD to Develop After a Trauma?

- Only some people who experience a traumatic event will develop PTSD. (U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)
- The extent of the survivor’s involvement in the trauma is an important factor in whether or not PTSD will develop. PTSD may be more likely to occur if the trauma survivor directly experienced the trauma or if he or she was seriously hurt in the trauma. PTSD is also more likely if the survivor believed that he or she or a family member was in danger, felt unable or powerless to help him or herself or others during the trauma, and/or had a severe anxiety response during the trauma. (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)
- The type of trauma and how severe it is are also important factors in whether or not PTSD will develop. PTSD may be more likely to occur after severe, long-lasting, or assaultive human violence such as torture, terrorist attacks, military combat, war-time captivity, ethnic or political genocide, or rape. (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000; American Psychiatric Association, Practice Guideline for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder, Part B, 2004; Lippincott Williams & Wilkins Medical Text: Kaplan & Sadock’s Synopsis of Psychiatry, 2003)
- Certain groups of people may be more prone to developing PTSD after a trauma. PTSD may be more likely to occur if the survivor suffered a previous trauma, has another mental health problem, has family members who have mental health problems, recently lost a loved one, went through recent stressful life circumstances, drinks a lot of alcohol, is female, has a low level of education, and/or is younger. (U.S. Department of Veterans Affairs, “How Common is PTSD?” www.ptsd.va.gov/public/pages/how-common-is-ptsd.asp, reviewed/updated 6/15/2010)

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What Other Problems May Veterans with PTSD Experience?

- Veterans with PTSD may also have depression, thoughts of suicide, alcohol or drug problems, traumatic brain injury, chronic pain, physical symptoms such as tremors and sweats, employment problems, and relationship problems including divorce and violence. (U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010 and “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Having both PTSD and another problem can make both conditions worse, but proper diagnosis and treatment by an experienced clinician can help. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)

How Is PTSD Diagnosed?

- PTSD is diagnosed by having a clinical interview with a trained mental health professional. (U.S. Department of Veterans Affairs, “How is PTSD Measured?” www.ptsd.va.gov/public/pages/ptsd-measured.asp, reviewed/updated 6/15/2010)
- During an evaluation for PTSD, the mental health provider will ask about the traumatic event and the veteran’s symptoms, assess the effect that the symptoms are having on the veteran’s life, and inquire about other problems the veteran is having. The evaluation may include a psychiatric and medical history, review of military documents and other records, and self-report questionnaires. Family members may also be asked to provide information. (U.S. Department of Veterans Affairs, “How is PTSD Measured?” www.ptsd.va.gov/public/pages/ptsd-measured.asp, reviewed/updated 6/15/2010)
- A positive PTSD screening questionnaire does not automatically mean a definitive diagnosis of PTSD. A positive screen indicates that further evaluation is needed. (U.S. Department of Veterans Affairs, “How is PTSD Measured?” www.ptsd.va.gov/public/pages/ptsd-measured.asp, reviewed/updated 6/15/2010)

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What is the Prognosis for Someone with PTSD?

- The course of PTSD is variable. Many patients with PTSD have significant improvement or complete recovery within a few months, but some have symptoms that persist longer than a year after the trauma and/or come and go over time. (Lippincott Williams & Wilkins Medical Text: Kaplan & Sadock's Synopsis of Psychiatry, 2003; American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000)
- A good outcome is more likely if the PTSD symptoms began rapidly and lasted a short time, if the survivor has good social support, if the survivor functioned well before the trauma, if the survivor is neither very young nor very old, and/or if there are no other psychiatric, medical, or drug/alcohol problems. (Lippincott Williams & Wilkins Medical Text: Kaplan & Sadock's Synopsis of Psychiatry, 2003)
- Worsening of symptoms can be triggered by “reminders of the original trauma, new traumatic events, or life stressors.” (American Psychiatric Association, Diagnostic and Statistical Manual of Mental Disorders IV-TR, pages 463-468, 2000)
- The anniversary of the trauma can also trigger a worsening of symptoms. An anniversary reaction can cause different types of distress, including mild sadness, anxiety, physical symptoms, an exacerbation or return of PTSD symptoms, and/or significant psychiatric deterioration. (U.S. Department of Veterans Affairs, “Anniversary Reactions: Research Findings,” www.ptsd.va.gov/professional/pages/anniversary_reactions_pro.asp, reviewed/updated 6/15/2010)
- If PTSD symptoms persist or fluctuate over time, treatment can help manage them. A variety of beneficial treatments are available. “[PTSD] symptoms do not have to interfere with everyday activities, work, and relationships.” (U.S. Department of Veterans Affairs, “What is PTSD?” www.ptsd.va.gov/public/pages/what-is-ptsd.asp, reviewed/updated 6/14/2010)

What is the Treatment for PTSD?

- Acknowledging and dealing with PTSD symptoms can be hard, especially for veterans who often tend to keep their feelings inside. But treatment, including counseling and/or medications, can help. (U.S. Department of Veterans Affairs, “Treatment of PTSD,” www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)

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- Depending on the clinical situation and the veteran’s preference, counseling and medications may be used separately or combined to treat PTSD. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline for Management of Post-Traumatic Stress, module I-2, http://www.healthquality.va.gov/ptsd/ptsd-sum_2010a.pdf, October 2010)

Types of Counseling

- *Cognitive Behavioral Therapy* (CBT) appears to be the most effective type of counseling for PTSD. In CBT, the veteran becomes aware of negative beliefs about self and the world and then works to change them through talking and behavioral exercises. (U.S. Department of Veterans Affairs, “Treatment of PTSD,” www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)
- Many survivors with PTSD have become nervous about and avoid situations that are associated with the trauma but that should not ordinarily trigger such anxiety. Cognitive-behavioral techniques can help reduce this “conditioned fear response.” (“Cognitive Therapy,” Kaplan and Sadock’s Synopsis of Psychiatry, 9th edition; Focus: the Journal of Lifelong Learning in Psychiatry, summer 2004) (Lippincott Williams & Wilkins Medical Text: Kaplan & Sadock’s Synopsis of Psychiatry, 2003)
- Two types of CBT are helpful – Cognitive Processing Therapy and Prolonged Exposure Therapy. (U.S. Department of Veterans Affairs, “Treatment of PTSD,” <http://www.ptsd.va.gov/public/pages/treatment-ptsd.asp>, January 2010)
- In *Cognitive Processing Therapy*, the therapist helps the trauma survivor change how he or she thinks about the trauma. With the assistance of the therapist, the veteran learns how his or her thoughts and feelings about the trauma have resulted in beliefs about the world that are causing excessive anxiety and fear. The veteran then learns to challenge these habitual, negative assumptions about safety and other people, and is taught skills to replace them with more accurate, balanced, and less distressing views. The veteran also makes progress in coming to terms with the trauma, including addressing guilt about decisions he or she had to make during the war and self-blame about things that could not have been prevented or changed. (U.S. Department of Veterans Affairs, “Treatment of PTSD,” www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010 and “Cognitive Processing Therapy,” www.ptsd.va.gov/public/pages/cognitive_processing_therapy.asp, reviewed/updated 2/28/2011)
- The goal of *Prolonged Exposure Therapy* is to become less fearful about the memories of the trauma. The veteran first learns breathing exercises and other techniques to use to relax when confronting an anxiety-provoking situation or discussing distressing memories. Then, using these relaxation techniques as needed and with the help of the therapist, the veteran faces

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fear-inducing situations via imagery, in the real world, or by talking about them. Usually, exposure therapy starts with less distressing situations and builds up to more anxiety-producing scenarios. It may seem counterintuitive that revisiting traumatic memories would be helpful, but it is precisely this repeated exposure, with a relaxed attitude in the presence of a supportive therapist, that makes the PTSD symptoms become less overwhelming. (U.S. Department of Veterans Affairs, "Treatment of PTSD," www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010 and "Prolonged Exposure Therapy," www.ptsd.va.gov/public/pages/prolonged-exposure-therapy.asp, reviewed/updated 3/9/2011)

- *Eye Movement Desensitization and Reprocessing (EMDR)* is another therapy for PTSD. While thinking or talking about the memories, the veteran focuses on something else, such as following the therapist's hand motions with his or her eyes. Studies have shown that EMDR helps decrease PTSD symptoms but that the eye movements may not be a necessary part of the therapy. Further research is being conducted to understand better how EMDR works. (U.S. Department of Veterans Affairs, "Treatment of PTSD," www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)
- *Group Therapy* is frequently a part of PTSD programs for veterans. In group therapy, the veteran shares his or her story with others who have been through a similar trauma and also have PTSD. Speaking in a group setting helps the veteran feel more comfortable talking about the trauma, encourages forming relationships with others, and improves self-esteem. (U.S. Department of Veterans Affairs, "Treatment of PTSD," www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)
- *Family Therapy* is a type of counseling in which the therapist helps a veteran and his or her family members communicate effectively and relate constructively to each other. It also helps a veteran's family understand the veteran's PTSD and better cope with difficult emotions and stress. (U.S. Department of Veterans Affairs, "Treatment of PTSD," www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)
- *Psychodynamic Psychotherapy*, which focuses on understanding how a veteran's past experiences contribute to his or her current difficulties, may be recommended in certain situations. (U.S. Department of Veterans Affairs, "Treatment of PTSD," www.ptsd.va.gov/public/pages/treatment-ptsd.asp, January 2010)

Types of Medications

- Several types of medications may be helpful in treating PTSD symptoms. (American Psychiatric Association, [Guideline Watch \(March 2009\): Practice Guideline for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder](#))

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- *Selective serotonin reuptake inhibitors* (SSRI's) and other kinds of antidepressant medications may be effective for veterans with PTSD. Antidepressants also treat depression, which may occur along with PTSD. Some antidepressants can help decrease anger and irritability, symptoms that may occur with PTSD. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline for Management of Post-Traumatic Stress, module I-2, 2010, http://www.healthquality.va.gov/ptsd/ptsd-sum_2010a.pdf; American Psychiatric Association, Practice Guideline for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder, section II-D, 2004)
- *Prazosin*, an antihypertensive, is a promising medication which is being increasingly used with some success in improving PTSD-related nightmares and sleep problems. (American Psychiatric Association, Guideline Watch (March 2009): Practice Guideline for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder)
- *Second-generation atypical antipsychotic medication* may also be helpful in boosting a veteran's partial response to antidepressants or in treating co-occurring psychotic symptoms. Monitoring for weight gain and metabolic changes is necessary when using atypical antipsychotic medications. (American Psychiatric Association, Guideline Watch (March 2009): Practice Guideline for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder)

What is Traumatic Brain Injury?

- *Traumatic Brain Injury* (TBI) is injury to the brain from a trauma, such as an explosion, accident, fall, or assault. TBI is caused by a "blow, jolt, or penetrating injury to the head that disrupts the function of the brain." (U.S. Department of Veterans Affairs, "Traumatic Brain Injury and PTSD," www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010; Defense and Veterans Brain Injury Center, "Blast Injuries," <http://dvbic.org/TBI---TheMilitary/Blast-Injuries.aspx>)
- A traumatic brain injury can occur even if there is no direct blow to the head, such as when shaking or whiplash causes the brain to bang against the inside of the skull and get bruised or when an explosion causes atmospheric pressure changes that injure the brain. (U.S. Department of Veterans Affairs, "Traumatic Brain Injury and PTSD," www.ptsd.va.gov/public/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 6/15/2010; "Psychiatric Disorders and Traumatic Brain Injury: What is the Connection?" Psychiatric Annals, November 2010, PsychiatricAnnalsOnline.com)

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- The main causes of TBI among civilians are “falls, motor vehicle accidents, being struck by an object, and assaults.” In the military population, the major causes of TBI are “blasts, blast plus motor vehicle accidents, motor vehicle accident alone, and gunshot wounds.” (U.S, Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Blast injuries among Operation Enduring Freedom and Operation Iraqi Freedom military service members may be caused by “improvised explosive devices (IEDs), vehicle-borne explosive devices (VBEDs), rocket-propelled grenades (RPGs), and mortar attacks.” (“Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury in the Military Population,” Lanier Summerall E and McAllister TW, Psychiatric Annals, November 2010, PsychiatricAnnalsOnline.com)

How are Traumatic Brain Injuries Classified?

- Traumatic brain injuries are classified according to the degree of the head injury sustained, not by the severity of symptoms resulting from the injury. The severity of post-concussive symptoms does not necessarily relate to the magnitude of the initial injury. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Mild TBI, which means the same thing as concussion, is characterized by being knocked out for less than 30 minutes, confusion or disorientation lasting less than 24 hours, memory loss lasting less than 24 hours, normal radiological imaging, and/or Glasgow Coma Scale rating that suggests mildly impaired neurological responsiveness and level of consciousness. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, Introduction and section 2.1, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; Center for Disease Control, “Glasgow Coma Scale,” <http://www.bt.cdc.gov/masscasualties/gscale.asp>, reviewed 6/23/2006)
- Moderate TBI is characterized by being knocked out for between 30 minutes and 24 hours, confusion or disorientation lasting more than 24 hours, memory loss lasting from one day to seven days, normal or abnormal radiological imaging, and/or Glasgow Coma Scale rating that suggests moderately impaired neurological responsiveness and level of consciousness. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 2.1, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; Center for Disease Control, “Glasgow Coma Scale,” <http://www.bt.cdc.gov/masscasualties/gscale.asp>, reviewed 6/23/2006)

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- Severe TBI is characterized by being knocked out for more than 24 hours, confusion or disorientation lasting more than 24 hours, memory loss lasting more than seven days, normal or abnormal radiological imaging, and/or Glasgow Coma Scale rating that suggests severely impaired neurological responsiveness and level of consciousness. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 2.1, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; Center for Disease Control, “Glasgow Coma Scale,” <http://www.bt.cdc.gov/masscasualties/gscale.asp>, reviewed 6/23/2006)
- “Penetrating TBI, or open head injury, is a head injury in which the dura mater, the outer layer of the [brain’s] meninges, is penetrated. Penetrating injuries can be caused by high-velocity projectiles or objects of lower velocity such as knives or bone fragments from a skull fracture that are driven into the brain.” (Defense and Veterans Brain Injury Center, “TBI Numbers,” <http://dvbic.org/TBI-Numbers.aspx>)

How Common is TBI?

- TBI is more common among our Operation Enduring Freedom and Operation Iraqi Freedom military personnel, as compared to veterans of previous wars, because of their increased exposure to blasts in Afghanistan and Iraq, the use of advanced body armor that allows survival of these blasts but does not prevent closed head injuries, and repeated deployments. (“Traumatic Brain Injury in the War Zone,” Okie S, The New England Journal of Medicine, 5/15/2005, www.nejm.org; “Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury in the Military Population,” Lanier Summerall E and McAllister TW, Psychiatric Annals, November 2010, PsychiatricAnnalsOnline.com)
- Figures reported in the literature range from 45,000 to 360,000 Operation Enduring Freedom and Operation Iraqi Freedom service members suffering from TBI. Some of these estimates may not be accurate, since they are based on answers to screening questions or are limited due to incomplete data collection. (Defense and Veterans Brain Injury Center, “TBI Numbers,” <http://dvbic.org/TBI-Numbers.aspx>)
- According to the Defense and Veterans Brain Injury Center, accurate determination of diagnostically confirmed cases of TBI from the military’s electronic medical record reveals a total of 212,742 Operation Enduring Freedom and Operation Iraqi Freedom service members with TBI of any severity as of May 15, 2011. Most TBI in OEF/OIF service members is classified as mild, with 163,181 cases of mild TBI recorded through May 15, 2011. (Defense and Veterans Brain Injury Center, “TBI Numbers,” <http://dvbic.org/TBI-Numbers.aspx>)

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How Does a Blast Cause TBI?

- Explosions can cause brain injury by several different mechanisms. (Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)
- *Primary blast injury* results from pressure changes caused by the explosion itself. The explosion produces very hot gases that expand and initially compress the surrounding air, thus increasing atmospheric pressure. The hot gases then expand further and cause a subsequent drop in atmospheric pressure. These extreme pressure changes can damage air- and fluid-filled organs and cavities, such as the ear, lung, gastrointestinal tract, brain, and spinal cord. Primary blast injury from an explosion is greatest for those closest to the blast or in a closed environment such as a vehicle. (“Psychiatric Disorders and Traumatic Brain Injury: What Is The Connection?” McAllister TW, [Psychiatric Annals](http://PsychiatricAnnals.com), November 2010, PsychiatricAnnalsOnline.com; Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)
- *Secondary blast injury* may be caused by loose fragments and debris that fly through the air and penetrate the brain. (Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)
- *Tertiary blast injury* may occur when the explosion throws a person into a solid object such as a wall or steering wheel. Brain injury can result from the blunt trauma of the head hitting a solid object or from jolting forces causing the head to jerk back and forth. (Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)
- *Quaternary blast injury* can result from serious blood loss or inhalation of toxic gases that causes injury to the brain. (Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)

What Symptoms May Occur After TBI?

- Regions of the brain involved in cognition (memory, learning, concentration, and executive function), mood, and behavior are susceptible to the damaging forces of an explosion, so “although each brain injury is different, there are certain features that are commonly seen.” (“Psychiatric Disorders and Traumatic Brain Injury: What is the Connection?” McAllister TW, [Psychiatric Annals](http://PsychiatricAnnals.com), November 2010, PsychiatricAnnalsOnline.com)

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- Traumatic brain injury may result in physical, cognitive, and emotional/behavioral symptoms. Many of these symptoms are not specific to TBI and may overlap with other conditions, such as PTSD or depression which may develop after a traumatic brain injury. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- *Physical symptoms* may include visual problems such as blurry vision or eyes tiring easily, headaches, lightheadedness or dizziness, increased sensitivity to sounds or lights, balance problems, ringing in ears, and/or excessive fatigue. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/public/pages/traumatic_brain_injury_and_ptsd.asp, reviewed/updated 6/15/2010; U.S. Department of Defense and Force Health Protection and Readiness, “TBI and PTSD Quick Facts,” http://www.nashia.org/docs/quick_white.pdf)
- *Cognitive symptoms* may include memory problems, decreased concentration, being more easily distracted, difficulty being organized, slowed thinking, trouble putting thoughts into words, and/or impairment in judgment, decision-making, or problem-solving. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/public/pages/traumatic_brain_injury_and_ptsd.asp, reviewed/updated 6/15/2010; U.S. Department of Defense and Force Health Protection and Readiness, “TBI and PTSD Quick Facts,” http://www.nashia.org/docs/quick_white.pdf)
- *Emotional/behavioral symptoms* may include sadness or anxiety, irritability and angering more easily, listlessness, feeling more overwhelmed, a change in usual interests or behavior, being more impulsive or having difficulty appropriately restraining certain behaviors, and/or sleep problems. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/public/pages/traumatic_brain_injury_and_ptsd.asp, reviewed/updated 6/15/2010; U.S. Department of Defense and Force Health Protection and Readiness, “TBI and PTSD Quick Facts,” http://www.nashia.org/docs/quick_white.pdf)

How is TBI Evaluated?

- Accurate evaluation of TBI requires a careful clinical interview and examination by an experienced clinician who is knowledgeable about blast injuries. (Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx>)
- Radiologic imaging such as CT or MRI, neuropsychological testing, or additional specialty consultation may be useful based on the clinical situation but is not always necessary. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 3.1.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)

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- A positive TBI screening questionnaire does not necessarily mean a definitive diagnosis of traumatic brain injury, but it does suggest the need for further evaluation by a professional. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Not every exposure to a blast results in a traumatic brain injury. Many military personnel are in the vicinity of a blast but do not suffer a traumatic brain injury. Nor does every loss of consciousness or memory necessarily indicate a TBI. (“Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury in the Military Population,” Lanier Summerall E and McAllister TW, *Psychiatric Annals*, November 2010, PsychiatricAnnalsOnline.com)
- The evaluation of symptoms from a combat-related traumatic brain injury that may occur along with other conditions can be hard to diagnose. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- Details of the original blast injury can be difficult to establish, especially in retrospect. For instance, a veteran’s post-blast confusion or loss of consciousness might be missed or overshadowed by more serious or life-threatening injuries. Also, a chaotic combat environment may make it harder to accurately report blast circumstances. In addition, multiple head traumas, from the same or different combat episodes, can further complicate the evaluation. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010; “Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury in the Military Population,” Lanier Summerall E and McAllister TW, *Psychiatric Annals*, November 2010, PsychiatricAnnalsOnline.com)
- Identifying persistent TBI symptoms in the presence of other conditions can be difficult. TBI and PTSD frequently present together with overlapping symptoms such as depression, anxiety, trouble sleeping, irritability, concentration problems, social withdrawal, and/or fatigue. Other psychiatric conditions or alcohol /drug abuse can further obscure and delay accurate detection of TBI symptoms. (“Comorbid Posttraumatic Stress Disorder and Traumatic Brain Injury in the Military Population,” Lanier Summerall E and McAllister TW, *Psychiatric Annals*, November 2010, PsychiatricAnnalsOnline.com; U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)

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What is the Prognosis for Someone with Mild TBI?

- Most traumatic brain injuries, including those which occurred during the Afghanistan and Iraq wars, are categorized as mild. (“Psychiatric Disorders and Traumatic Brain Injury: What is the Connection?” McAllister TW, Psychiatric Annals, November 2010, PsychiatricAnnalsOnline.com)
- “Concussion/mild TBI is a common injury with a time-limited and predictable course.” The majority of patients with mild traumatic brain injury recover fully without any specific medical treatment. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, Guideline Key Points, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- Most patients with mild TBI experience some symptoms immediately after the injury but will recover completely within three to six months. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)
- A minority of patients have TBI-related symptoms persisting beyond six months. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, Guideline Key Points, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- Some OEF/OIF veterans may experience TBI-related symptoms for a longer time than civilians do. The reason for enduring symptoms in some veterans is unclear, but possible theories include the complicated mechanism of blast injury, the frequent co-occurrence of other diagnoses that can complicate recovery, and the exposure of military service personnel to multiple head injuries. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010; Defense and Veterans Brain Injury Center, “Blast Injuries,” <http://dvbic.org/TBI---The-Military/Blast-Injuries.aspx> and “Cumulative Concussions,” <http://dvbic.org/TBI---The-Military/Cumulative-Concussions.aspx>)

What is the Prognosis for Someone with Moderate or Severe TBI?

- Veterans with moderate and severe brain injuries often have neurological deficits and may have significant brain damage, but “some of these patients can make remarkable recoveries.” (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)

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- Ongoing therapy, including cognitive rehabilitation, vocational rehabilitation, case management, and prescription of medications, may be needed to help these veterans maximize their prognosis and return to the highest level of functioning possible. (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)

What is the Initial Treatment for Mild TBI Symptoms?

- “The management of patients who present with symptoms following a concussion/mild TBI injury should focus on promoting recovery and avoiding harm.” (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, Guideline Key Points, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- Recommendations include the following: a period of rest; professional guidance to improve sleeping habits, relieve stress, maximize social support; use of medications as prescribed by a doctor; avoidance of caffeine, tobacco, alcohol, diet and energy supplements, some cold medicines and other stimulants, and sleeping pills; a gradual and monitored exercise program; lifestyle and environmental modifications as needed; and progressive return to usual activities and normal duties. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, Guideline Key Points and sections 4.3, 4.4, and 5.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; U.S. Department of Veterans Affairs, “Quick Guide – Patient/Family: Traumatic Brain Injury,” <http://www.mirecc.va.gov/docs/vsn6/TBI-handout-vet-family.pdf>)
- Limiting job duties or activities that could cause another head injury should be considered until the patient is recovered. (U.S. Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 4.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- “Education [on what to expect and how to manage TBI symptoms] for the patient and family early in the course of recovery can improve outcomes in patients with TBI and help to prevent the development of other psychological problems.” (U.S. Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/professional/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010)

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What is the Treatment for Persistent Mild TBI Symptoms?

- “Although the majority of patients with mild TBI/concussion recover quickly with minimal intervention, there is a subset [of patients] that develops lingering symptoms that can interfere with social and occupational functioning.” (Defense and Veterans Brain Injury Center, “Strategies for Symptom Management,” <http://dvbic.org/Providers/Strategies-for-Symptom-Management.aspx>)
- Veterans who have symptoms that persist beyond four to six weeks and are not improving with initial interventions need further assessment. Referral to a specialist for treatment of other contributing conditions or for TBI rehabilitation may be needed. Management of TBI-related symptoms is generally inter-disciplinary and overseen by the primary care provider. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, sections 6,7, and 9, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- There is an increased incidence of psychiatric disorders in patients with traumatic brain injuries. In addition to PTSD and depression, other anxiety or mood disorders, alcohol/drug abuse, and/or mental health conditions from before the brain injury can worsen a veteran’s TBI-related symptoms. Psychiatric treatment can help, and mental health consultation should be considered. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 5.3, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; Department of Veterans Affairs, “Traumatic Brain Injury and PTSD,” www.ptsd.va.gov/prof/pages/traumatic-brain-injury-ptsd.asp, reviewed/updated 9/16/2010; “Psychiatric Disorders and Traumatic Brain Injury: What is the Connection?” McAllister TW, Psychiatric Annals, November 2010, PsychiatricAnnalsOnline.com)
- Patients with persisting physical symptoms should be referred to the appropriate specialist for evaluation and treatment. Consultations with specialists in neurology, pain management, otolaryngology (ear, nose and throat), gastroenterology, physical medicine and rehabilitation, physical therapy, optometry, ophthalmology, audiology, and speech and language pathology may be necessary. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 7.5, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- For patients with persisting cognitive symptoms, neuropsychological assessment by a trained clinician can identify cognitive deficits and strengths and help guide treatment. Treatment may include cognitive rehabilitation, use of memory devices, and medications. Treatment might include referrals to a cognitive rehabilitation therapist, TBI specialist, speech and language pathologist, occupational therapist, recreational

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therapist, case manager, social worker, vocational rehabilitation therapist, mental health professional, neuropsychologist, and others as needed. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, sections 7.6 and 9, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)

What is the Role of Medications in Treating Mild TBI Symptoms?

- There is no definitive research to guide pharmacologic treatment in patients with mild TBI, but there is growing evidence that medications may improve some post-concussive symptoms. Medicines to treat headaches, physical pain, sleeping problems, concentration problems, irritability, depression, and anxiety may be helpful for patients recovering from traumatic brain injury. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, sections 5.4 and 7.5, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- Physicians may avoid giving patients with TBI medications that have the potential side effects of seizures, confusion, or sedation because patients with TBI may have a higher risk of experiencing these side effects. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 5.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- It is not unusual for medications to be started one at a time, at low dose that is gradually increased to therapeutic levels, or for a medication to be started and then stopped if deemed ineffective. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 5.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009; Defense and Veterans Brain Injury Center, “Strategies for Symptom Management,” <http://dvbic.org/Providers/Strategies-for-Symptom-Management.aspx>)
- Patients with a traumatic brain injury may be more sensitive to medication side effects, toxicity, and drug-drug interactions, so it is vitally important to watch for unwanted side effects. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 5.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)
- It is important to avoid caffeine, alcohol, stimulants or sleeping pills, and herbal, diet, or energy supplements since they can cause dangerous side effects when combined with prescription drugs. (Department of Veterans Affairs and Department of Defense, Clinical Practice Guideline For Management of Concussion/mild TBI, section 5.4, http://www.healthquality.va.gov/mtbi/concussion_mtbi_full_1_0.pdf, 2009)

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Some Resources for Information on the Treatment of PTSD and TBI

- Department of Veterans Affairs
 - VA National PTSD website <http://www.ptsd.va.gov/index.asp>
 - VA “Where to get help” page <http://www.ptsd.va.gov/public/where-to-get-help.asp>
 - PTSD Information Line 802-296-6300
 - VA 24/7 Veteran Combat Call Center 1-877-927-8387
 - VA 24/7 National Suicide Prevention Hotline 1-800-273-8255
 - VA website to chat live with a crisis counselor www.suicidepreventionlifeline.org/Veterans

- Defense Centers of Excellence (DCOE) for Psychological Health and Traumatic Brain Injury
 - DCOE website <http://www.dcoe.health.mil/24-7help.aspx>
 - DCOE 24/7 phone number for information and resources 1-866-966-1020
 - DCOE email address resources@dcoeoutreach.org

- Military OneSource
 - Military OneSource website <http://www.militaryonesource.com/MOS/About/MoreAboutMilitaryOneSource.aspx>
 - Military OneSource 24/7 phone number for access to masters level consultant 1-800-342-9647

- Defense and Veterans Brain Injury Center (DVBIC)
 - DVBIC website <http://dvvbic.gbkdev.com/Service-Members---Veterans.aspx>
 - DVBIC referral website <http://dvvbic.gbkdev.com/Locatoins.aspx>
 - DVBIC phone number 1-800-870-9244

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