GOOD AFTERNOON LADIES & GENTLEMEN - & MY NAME IS MICHELLE KOZLOWSKI &

I WILL BE QUITE BRIEF:

(1) I AM A SPOUSE & A PARENT TO MALES (WHO HAVE SERVED IN USMC. (SEE (1) ATTCH)

(2) MY SPOUSE HAD A HISTORY OF TBIS THAT WERE UNTREATED UNTIL 2009 (HEALTH RECORD - USMC 1986) - SEE (1) ATTCH

(3) THE DoD HAS CHARTED TBIS FOR THE PAST DECADE. SEE 2-~~B~~ ATTCH

(4) TBI INFORMATION REGARDING DoD & IMPACT (SEE 2-B ATTACHED)

(5) TBI INFORMATION FROM CDC & STATE OF NV. (SEE 3 ATTCH)

(6) TBI INFORMATION ABOUT PERSONS IN PRISON & IN JAIL. (SEE 4 ATTCH)

(7) I ADDRESS THIS BOARD BECAUSE THE JUDICIAL SYSTEM HAS & IS FAILING PERSONS w/ TBI — & THEY END UP IN CUSTODY, ONLY TO RETURN. "VETERAN'S COURT" IS OPTIONAL.

1/5

NSN 7540-00-634-4176 600-107

HEALTH RECORD | **CHRONOLOGICAL RECORD OF MEDICAL CARE**

Ø1

DATE	SYMPTOMS, DIAGNOSIS, TREATMENT, TREATING ORGANIZATION *(Sign each entry)*
12 NOV 1986	22 AREA BRANCH CLINIC NAVAL HOSPITAL CAMP PENDLETON, CA 92055
T - 97.8	MVA X 4 days
BP - 128/90	22 y/o WO♂ involved in MVA 4
P - 64	days ago .. seen at Tri-Cities Hospital; LOC
R - 18	x 2 hrs.; not kept at hospital ..
	multiple XR ⊖; scalp and eyelid laceration
	O.S; states nausea, dizziness; no syncope
0915	no visual / hearing Ds; no paresthesias;
	otherwise healthy; MEDS - ASA, NFMA
M.O.	O: well developed, WN WO♂ in NAD
	VSS
	HEENT - canals patent, TMs clear / intact
	upper lid ecchymosis w/ 1 cm laceration O.S.; stellate laceration ⊖
	temporal region; fundi benign
	otherwise WNL
	NEURO: tone, strength, reflexes equal bilaterally
	motor / sensory modalities intact
	A: post - concussion syndrome
	P: LDC, Cama
	SR eyelid
	RTC 14 NOV

Fawco
Brian P. Fawcett M.D.
[redacted]
LCDR USN/MC

PATIENT'S IDENTIFICATION *(Use this space for Mechanical Imprint)*

RECORDS MAINTAINED AT:		
PATIENT'S NAME *(Last, First, Middle initial)* KOZLOWSKI, STEVE JOHN		SEX MALE
RELATIONSHIP TO SPONSOR	STATUS AD	RANK/GRADE PCPL
SPONSOR'S NAME		ORGANIZATION HMA-169
DEPART./SERVICE USMC	SSN/IDENTIFICATION NO. [redacted]	DATE OF BIRTH 09 AUG 69

CHRONOLOGICAL RECORD OF MEDICAL CARE

STANDARD FORM 600 (REV. 5-84)
Prescribed by GSA and ICMR
FPMR (41 CFR) 101-11.806-8

☆GPO : 1984 O - 421-526 (125)

2/5

UNITED STATES MARINE CORPS
Marine Light Attack Helicopter Squadron 369
Marine Aircraft Group 39
3d Marine Air Wing, FMFPac
Marine Corps Air Station
Camp Pendleton, California 92055-6095

5800
1:a:LOFRMA
25 Nov 1987

Mrs. Michelle I. Kozlowski
3747 Cherrystone St
Oceanside, CA 92054

Dear Mrs. Kozlowski,

I regret the necessity of informing you that your husband, Private Steven J. Kozlowski, USMC, has been absent from this organization since 17 November 1987. Should you know of his whereabouts, please inform him to return. Absence without leave is a serious military offense which becomes more serious as the length of absence increases.

In the event that he remains absent more than 30 days, he will be declared a deserter and civil law enforcement authorities will be requested to assist in his apprehension.

It is my sincere desire that he not suffer the status of a fugitive at large. If I can be of any assistance to you in this matter, please do not hesitate to write or call me at area code (619) 725-3917. In the event that he does not have sufficient funds to defray the cost of travel to this command, or if you need further assistance, you may contact the Marine Corps Representative or Marine Corps Activity nearest you.

Sincerely,

W. H. RIDDICK
Lieutenant Colonel
U. S. Marine Corps

UNITED STATES MARINE CORPS
Marine Attack Helicopter Squadron 369
MAG 39 3d MAW, FMFPac
MCB, Camp Pendleton, California 92055

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

U.S.MAIL

POSTAGE AND FEES PAID

MICHELLE I. KOZLOWSKI
3747 CHERRYSTONE ST.
OCEANSIDE, CA 92054

3/5

If you cannot read this message, please click here.

REAL WARRIORS • REAL BATTLES
REAL STRENGTH

E-MAIL UPDATE

ACTIVE DUTY • NATIONAL GUARD & RESERVE • VETERANS • FAMILIES • HEALTH PROFESSIONALS

Friday, February 12, 2010

www.realwarriors.net

Forward to a Friend

January Highlights

January was an exciting month for the Real Warriors Campaign. One of our profilees, Staff Sgt. Megan Krause had an interview on CNN, and also was one of CNN's "Intriguing People" for January 11. Additionally, we launched a new video profile of Air Force Lt. Col. Mary Carlisle, featured on the right. The Real Warriors Campaign was also featured in 17 news stories in January, which you can access through our new Real Warriors Campaign News page. Additionally, we launched a new Social Media page, which gives our visitors access to our Twitter, Facebook and other social media accounts all from one area.

New Articles

Prepare for the Challenges of Multiple Deployments

Warriors and family members in all components of the armed forces are experiencing the increased stresses of multiple deployments, whether they are single service members, single parents, dual military, active duty personnel, reservists or National Guard members. This article offers ideas for physically and psychologically preparing for multiple deployments to strengthen resilience and cope with additional challenges.

Tools to Use When Counseling Service Members

As civilian providers are called upon to counsel returning service members with concerns about psychological health (PH) and traumatic brain injury (TBI), they may wish to find new ways to become familiar with military culture and stay current on new military initiatives to decrease stigma across the armed forces. Read this article to find tools, training and other resources to develop skills in creating and maintaining

Partner Spotlight

sports legacy

The Sports Legacy Institute aims to solve the concussion crisis in sports and the military through medical research, treatment, education and prevention. The Sports Legacy Institute is primarily focused on the study of the brain disease chronic traumatic encephalopathy, a condition caused by repetitive concussive and sub-concussive brain injuries, and hopes to prevent future cases while learning to treat those currently coping with it.

Carlisle Video Profile

Your Profile Here

Sharing stories lets warriors know that they are not alone in dealing with a psychological wound or traumatic brain injury.

open lines of communication with service members.

Support for the Real Warriors Campaign

The Real Warriors Campaign recently visited Super Bowl XLIV, and with the support of NFL greats such as former Detroit Lion Eric Hipple, we are encouraging athletes and service members alike to reach out for the care they need to cope with the psychological health concerns associated with traumatic brain injuries.

"*Whether you're on the battlefield or the football field, the stigma around seeking care for PTSD– and TBI–related issues must be eliminated*," Hipple, who currently serves as the Outreach Coordinator for the University of Michigan Depression Center at Ann Arbor, said. "*In football, we use sports psychologists to make us better players, whether in preparation for kickoff or the recovery of injuries in the off season. Having a healthy mind is paramount for elite athletes, and even more so for our elite Warriors.*"

"*Getting help for a TBI or related concerns doesn't mean the end of a career," he said, "In the long run, seeking treatment makes you stronger, not weaker.*"

We have received a significant amount of positive feedback about the Campaign, and one recent correspondent gave us her permission to share what she had to say. Michelle Kozlowski, the mother of an active duty Marine and wife of a formerly active duty Marine, demonstrates how the Real Warriors Campaign has made a difference for her and for her family:

"*I want to share with you that since I found the Web site Real Warriors and numerous resources linked through it and the DCoE, I have a focus and a direction that I have never had before. It is what gets me up in the morning and it is what drives me to want to make a difference, in my life and in my family's and our community's.*

Talking about the psychological effects of war on service members openly breaks down stigma. Learning what others are doing to address these issues creates new opportunities for healing.

If you are a Real Warrior and would like to share your story with the Real Warriors Campaign, please e-mail us at DCoE.Realwarriors@tma.osd.mil.

Web 2.0 and Social Media

- Message Boards
- Twitter
- Facebook
- YouTube
- TroopTube
- Digg
- Delicious
- StumbleUpon

Sign up for our RSS feed to be notified whenever we post a new article on our site.

If you're not on Twitter, you can still follow our tweets, as well as Military Health System's tweets. Just visit our Tweet Monitor to see what we're discussing!

I cannot tell you how grateful I am that DoD and all the related departments are working so hard to get the wellness information to the warriors, families, caregivers, providers and communities in the country. Our family needed this decades ago but we especially require the support now with the multiple TBIs (and PTSD due to legal matters) that our family is having to manage.

Thank you for the mind blowing (a positive action) campaign that is continuing to grow with leaps and bounds. It is amazing—the best single resource for the unique challenge that our nation has had to face."

Upcoming Events

February Conference

Visit the Real Warriors exhibit on Feb. 18 at the Virginia is for Heroes 2010 Conference, a one-day event in Richmond, Va that will address combat/operational stress and TBI. Conference participants will include national, state and local leaders, subject matter experts and those serving on the "front lines" of behavioral healthcare and supportive services for veterans.

March Conferences

DCoE will be exhibiting at the following conferences in March. Stop by the booth for Real Warriors materials and information:

- March 4—7, Baltimore, Md: Anxiety Disorders Association of America 2010 Annual Conference: Anxiety Across the Lifespan: Practical integration of Basic and Clinical Approaches
- March 10–14, Arlington, Va: International Brain Injury Association's Eighth World Congress on Brain Injury

FAQs | Site Map | Privacy Policy | Web Site Policies | FOIA | USA.gov

Subscribe | Unsubscribe

DoD Numbers for Traumatic Brain Injury

#82-A

DoD Numbers for TBI

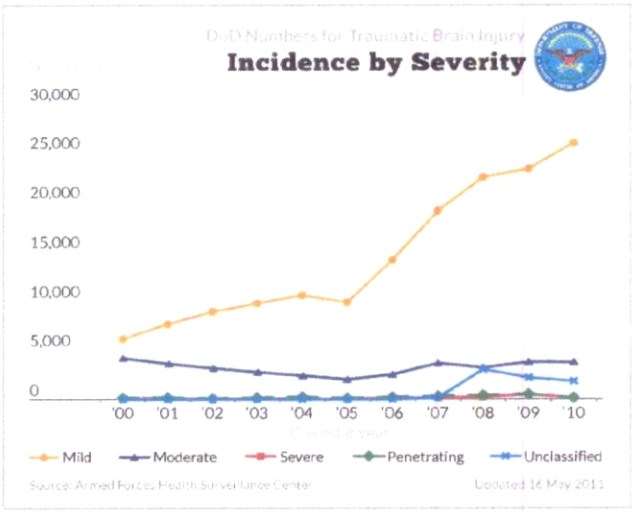
Totals at a Glance

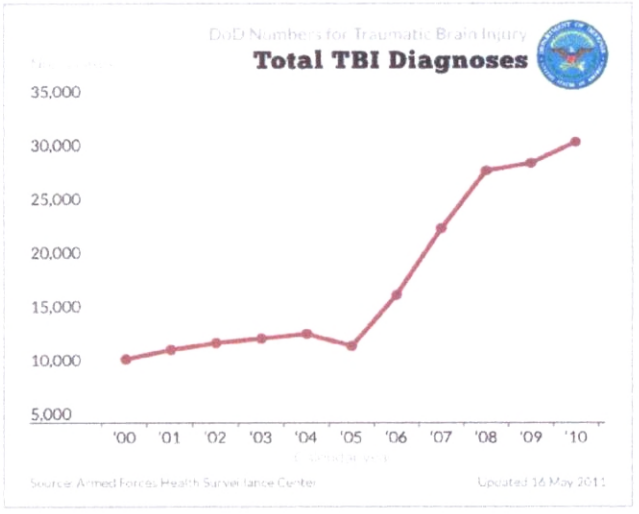
Frequently Asked Questions

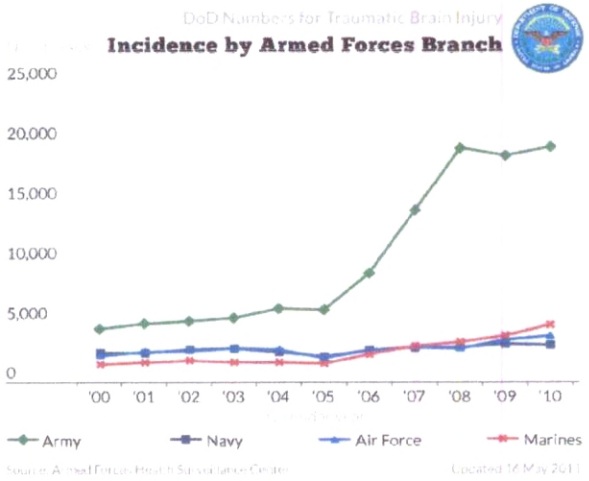
Archives

DOD WORLDWIDE NUMBERS FOR TBI - TOTALS AT A GLANCE

Current TBI Numbers | Totals at a Glance | FAQs | Archives







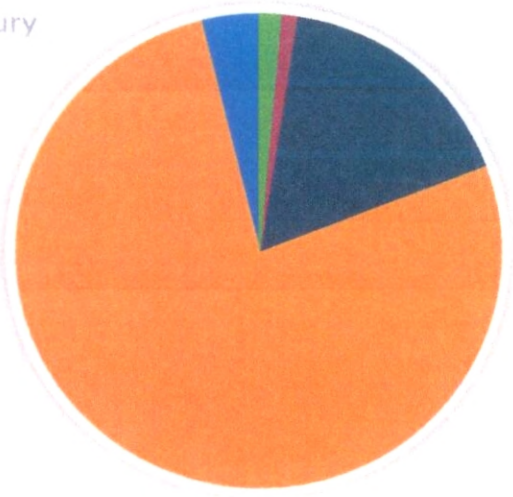
TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

'00-'11 Q2 Totals

Penetrating	3,631
Severe	2,288
Moderate	36,752
Mild	169,209
Not Classifiable	8,550
Total - All Severities	220,430

Source: Armed Forces Health Surveillance Center



Numbers for 2000 - 2011 Q2, as of 15 Aug 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2000 - 2011 Q2, as of 15 Aug 2011

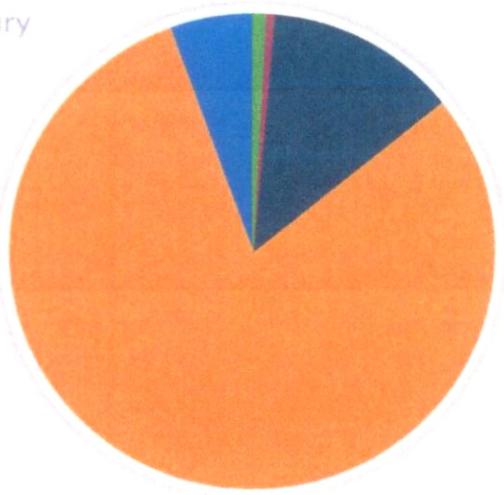
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2010 Totals

Penetrating	290
Severe	231
Moderate	4,107
Mild	25,103
Not Classifiable	1,622
Total - All Severities	31,353



Source: Armed Forces Health Surveillance Center

Numbers for 2010 , as of 15 Aug 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2010, as of 15 Aug 2011

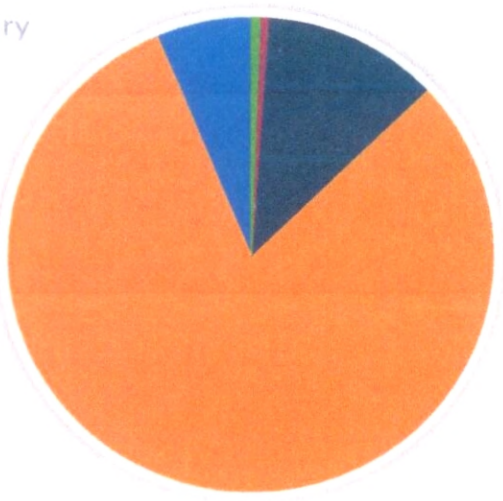
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2009 Totals

Penetrating	486
Severe	323
Moderate	3,751
Mild	22,673
Not Classifiable	2,022
Total - All Severities	29,255



Source: Armed Forces Health Surveillance Center

Numbers for 2009, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2009, as of 16 May 2011

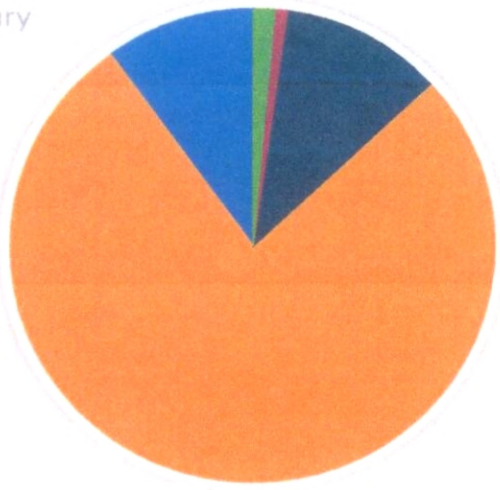
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2008 Totals

Penetrating	437
Severe	249
Moderate	3,343
Mild	21,859
Not Classifiable	2,679
Total - All Severities	28,567



Source: Armed Forces Health Surveillance Center

Numbers for 2008, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2008, as of 16 May 2011

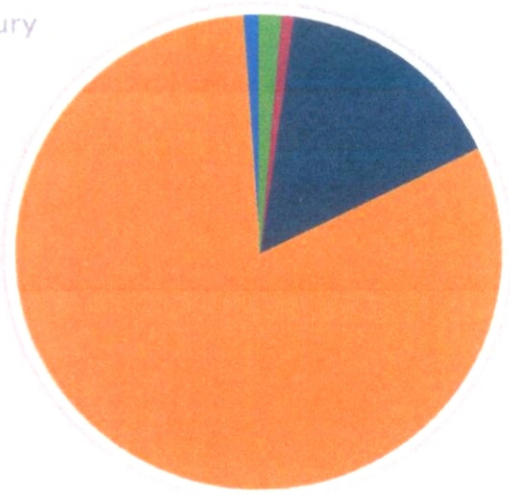
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2007 Totals

Penetrating	375
Severe	216
Moderate	3,708
Mild	18,665
Not Classifiable	210
Total - All Severities	23,174



Source: Armed Forces Health Surveillance Center

Numbers for 2007, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2007, as of 16 May 2011

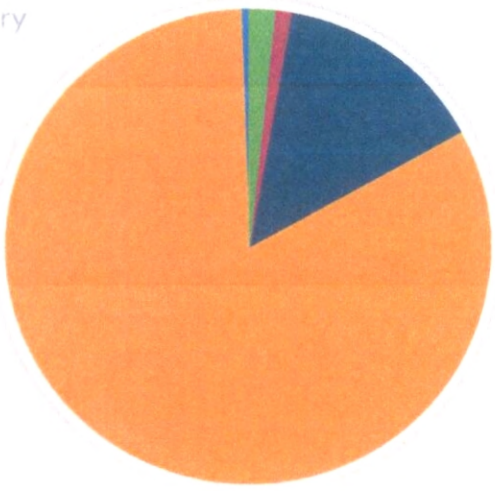
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2006 Totals

Penetrating	322
Severe	199
Moderate	2,466
Mild	13,919
Not Classifiable	52
Total - All Severities	16,958



Source: Armed Forces Health Surveillance Center

Numbers for 2006, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2006, as of 16 May 2011

Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

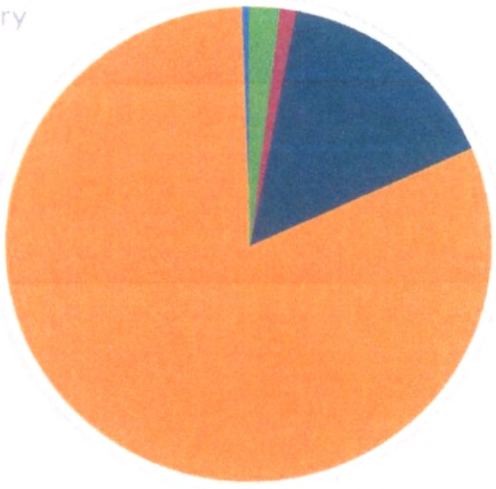
TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2005 Totals

Penetrating	248
Severe	159
Moderate	1,906
Mild	9,857
Not Classifiable	41
Total - All Severities	12,211

Source: Armed Forces Health Surveillance Center



Numbers for 2005, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2005, as of 16 May 2011

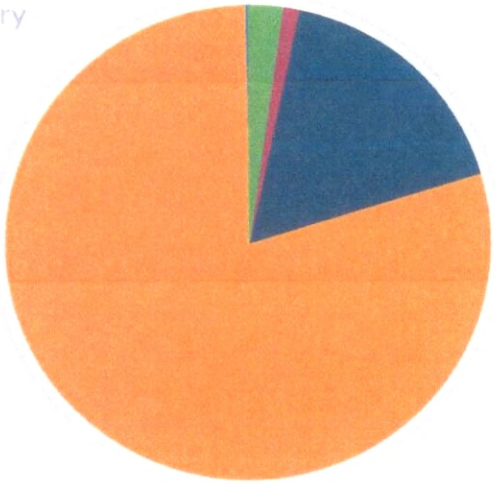
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2004 Totals

Penetrating	314
Severe	149
Moderate	2,281
Mild	10,536
Not Classifiable	32
Total - All Severities	13,312



Source: Armed Forces Health Surveillance Center

Numbers for 2004, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2004, as of 16 May 2011

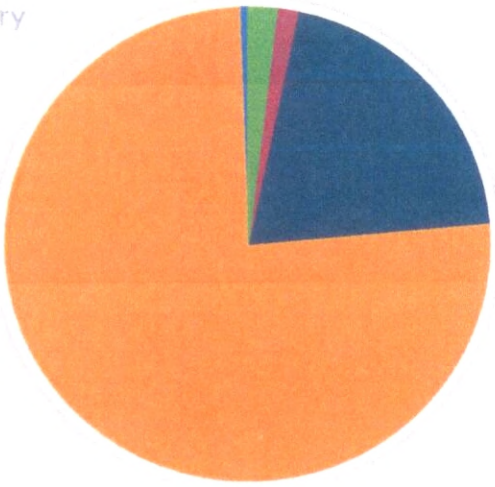
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2003 Totals

Penetrating	276
Severe	173
Moderate	2,643
Mild	9,770
Not Classifiable	36
Total - All Severities	12,898



Source: Armed Forces Health Surveillance Center

Numbers for 2003, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2003, as of 16 May 2011

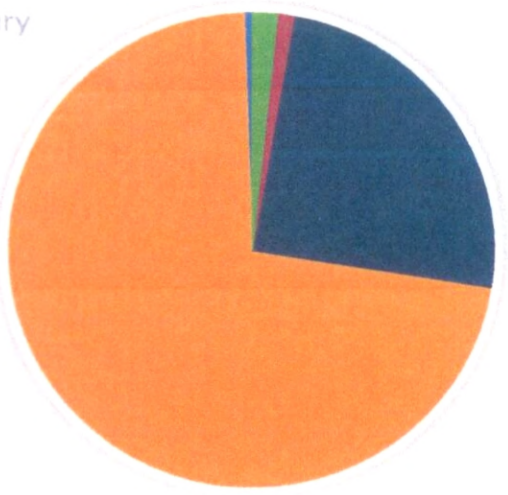
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2002 Totals

Penetrating	231
Severe	149
Moderate	3,077
Mild	8,974
Not Classifiable	39
Total - All Severities	12,470



Source: Armed Forces Health Surveillance Center

Numbers for 2002, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2002, as of 16 May 2011

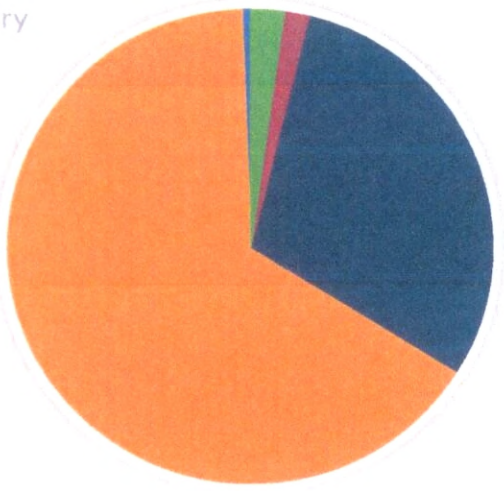
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2001 Totals

Penetrating	291
Severe	187
Moderate	3,553
Mild	7,760
Not Classifiable	39
Total - All Severities	11,830



Source: Armed Forces Health Surveillance Center

Numbers for 2001, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2001, as of 16 May 2011

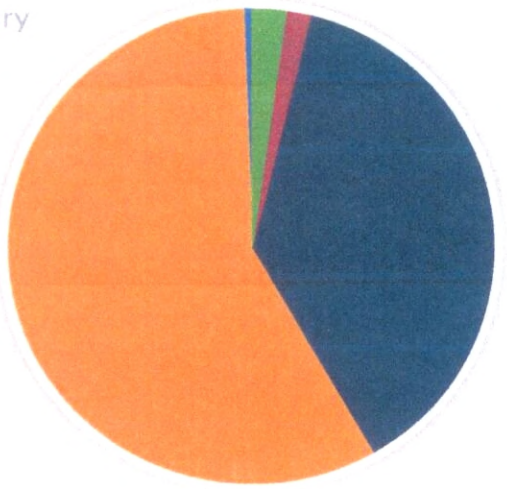
Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

TBI Numbers By Severity – All Armed Forces

DoD Numbers for Traumatic Brain Injury

2000 Totals

Penetrating	273
Severe	177
Moderate	4,150
Mild	6,326
Not Classifiable	37
Total - All Severities	10,963



Source: Armed Forces Health Surveillance Center

Numbers for 2000, as of 16 May 2011

Concussion/Mild TBI is characterized by the following: A confused or disoriented state which lasts less than 24 hours; loss of consciousness for up to 30 minutes; memory loss lasting less than 24 hours; and structural brain imaging (MRI or CT scan) yielding normal results.

Moderate TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 30 minutes, but less than 24 hours; memory loss lasting greater than 24 hours but less than seven days; and structural brain imaging yielding normal or abnormal results.

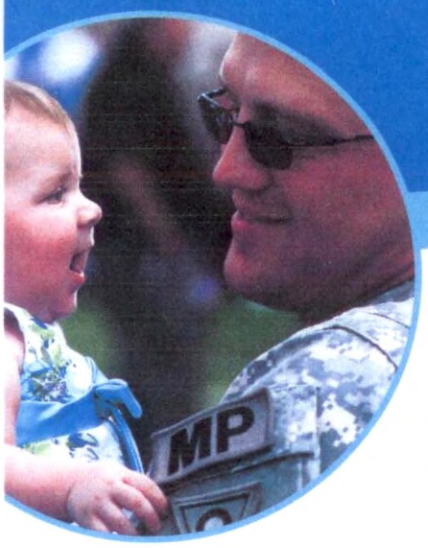
Severe TBI is characterized by the following: A confused or disoriented state which lasts more than 24 hours; loss of consciousness for more than 24 hours; memory loss for more than seven days; and structural brain imaging yielding normal or abnormal results.

Penetrating TBI, or open head injury, is characterized by the following: A head injury in which the dura mater, the outer layer of the 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.

Numbers for 2000, as of 16 May 2011

Source: Defense Medical Surveillance System (DMSS) and Theater Medical Data Store (TMDS)
Prepared by Armed Forces Health Surveillance Center (AFHSC)

Mild Traumatic Brain Injury



DEFINITION

A traumatic brain injury (TBI) is a blow or jolt to the head that disrupts the normal function of the brain. The severity of the TBI is determined at the time of the injury and may be classified as: mild, moderate or severe.

DID YOU KNOW?

Concussion – another word for a mild TBI – is the most common form of TBI in the military. Symptoms of concussion often resolve within days or weeks.

COMMON SIGNS AND SYMPTOMS

Physical

Headache
Sleep disturbances
Dizziness
Balance Problems
Nausea/vomiting
Fatigue
Visual disturbances
Light sensitivity
Ringing in ears

Cognitive

Slowed thinking
Poor concentration
Memory problems
Difficulty finding words

Emotional

Anxiety
Depression
Irritability
Mood swings

Defense and Veterans Brain Injury Center
The primary operational TBI component of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury

www.dvbic.org

Mild Traumatic Brain Injury

COPING TIPS

- Write things down.
- Store important items like keys in a designated place to keep from losing them.
- Pace yourself and take breaks as needed.
- Focus on one thing at a time.
- Allow time for your brain to heal. It's the most important thing you can do.

Recovery is different for every person and depends on the nature of the injury.

RECOVERY TIPS

- Avoid smoking or drinking alcoholic beverages.
- Sit out of contact sports.
- Get enough sleep — seven to eight hours a night.
- Take medications as instructed.
- Avoid overexerting yourself physically or mentally.
- If you're concerned about your symptoms or if they're not improving, see your provider.
- Stay engaged with your family and provider as your symptoms improve.

FIND A DVBIC SITE NEAR YOU:

Camp Lejeune, NC
Camp Pendleton, CA
Fort Bragg, NC
Fort Carson, CO
Fort Hood, TX
Landstuhl RMC, Germany
NMC San Diego, CA
San Antonio MMC, TX
Walter Reed AMC, DC
VA Boston, MA
VA Minneapolis, MN
VA Palo Alto, CA
VA Richmond, VA
VA Tampa, FL
DVBIC Charlottesville
DVBIC Johnstown

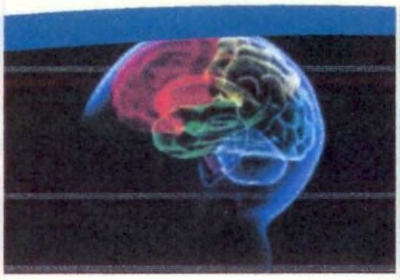
www.dvbic.org

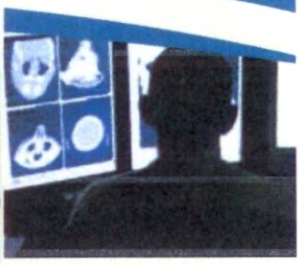
PHOTOS COURTESY OF DEPARTMENT OF DEFENSE

Defense and Veterans Brain Injury Center

www.dvbic.org

The primary operational TBI component of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury





Traumatic Brain Injury

Background

The Defense Department maintains a traumatic brain injury (TBI) database, which shows that 202,281 service members sustained a TBI between 2000-2010, with the majority experiencing a mild TBI or concussion. Approximately 85 to 90 percent of combat exposed troops who sustain a mild TBI experience a complete resolution of symptoms within the first several days to weeks after the incident.

Definition

In October 2007, the Defense Department established a formal definition of TBI consistent with other respected national and international organizations as a "traumatically induced structural injury and/or physiological disruption of brain function as a result of an external force." The injury is indicated by the onset or worsening of at least one of the following factors immediately after the event:

- Any period of loss or a decreased level of consciousness
- Any loss of memory of events immediately before or after the injury
- Any alteration in mental state at the time of the injury (confusion, disorientation, slowed thinking, etc.)
- Neurological deficits (i.e., weakness, loss of balance, change in vision, numbness, etc.)
- Intracranial lesion

External forces may include any of the following events:

- Head being struck by an object or head striking an object
- Brain undergoing an acceleration/deceleration movement without direct external trauma to the head
- Foreign body penetrating the brain
- Forces generated from events such as blast or explosion, or other force yet to be defined

The leading causes of TBI in the military are:

- Blasts
- Fragments
- Bullets
- Motor vehicle accidents
- Falls

TBI Severity

There are four different grades of TBI, and they are as follows:

Mild TBI/concussion: A confused or disoriented state lasting 24 hours or less; loss of consciousness for up to 30 minutes; and memory loss lasting less than 24 hours.

Moderate TBI: A confused or disoriented state that lasts more than 24 hours; loss of consciousness for more than 30 minutes but less than 24 hours; and memory loss lasting for more than 24 hours, but less than seven days.

Severe TBI: A confused or disoriented state that lasts more than 24 hours; loss of consciousness for more than 24 hours; and memory loss for seven days or more.

Penetrating TBI or open head injury: The outer layer of the brain is penetrated by a foreign object.

TBI Symptoms

TBI symptoms fall into three categories: physical, cognitive and behavorial/emotional

Physical symptoms: Headache, dizziness, balance disorder, nausea, fatigue, sleep disturbance, blurred vision, light sensitivity, hearing loss, noise sensitivity, seizures, transient neurological abnormalities, numbness and tingling

Cognitive: Difficulties with attention, concentration, memory, processing speed, judgment, executive control

Behavorial/emotional: Depression, anxiety, agitation, irritability, impulsivity, aggression

TBI Prevention

Prevention of TBI is the safest and most cost-efficient course of action. The Defense Department and the services are working diligently to improve today's helmet designs, reduce the risks of blunt impact, provide greater ballistic protection and guard against blast injury. As most TBIs occur in non-deployed settings, the Defense Department has launched an aggressive TBI prevention campaign emphasizing the use of seatbelts and protective eyewear and gear when service members are engaged in daily and recreational activities.

TBI Screening and Identification

While it is best that TBI screening occur close to the time of injury, this does not always happen. Thus, TBI screening occurs in two environments: deployed setting and non-deployed setting. The Defense and Veterans Brain Injury Center (DVBIC), a DCoE component center, is responsible for TBI surveillance across the Defense Department.

Treating TBI may not always involve providers in just one medical specialty. Rather, addressing TBI should be viewed as an interdisciplinary endeavor requiring an integrated approach that includes neurology, neurosurgery, psychiatry, neuropsychology, medicine and rehabilitation.

Medical evaluations are now mandatory following operational events such as exposure to blasts. The Defense Department issued a Directive-Type Memorandum in 2010 noting it was official policy to identify, track and ensure to the fullest extent possible the protection of service members exposed to potential concussive events, including blasts. This policy includes a medical evaluation for any service member exposed to such an event and directs the management of concussion treatment with the use of approved clinical guidance.

A standardized TBI evaluation includes the Military Acute Concussion Evaluation tool (MACE), to identify service members at high risk for possible TBI. The MACE is a tool that can be used for any acute concussion and is ideally administered within 72 hours of injury.

During deployment this screening takes place anytime a service member is evacuated from theater to Landstuhl Regional Medical Center for battle or non-battle injuries and illnesses. Additionally, all service members returning from deployment must undergo the post-deployment health assessment, which identifies those who were exposed to an injury event, lost consciousness, had concussive symptoms or still have them. Three to six months later, service members complete a post-deployment health reassessment.

Any service member entering a Veterans Affairs medical center for clinical care undergoes TBI screening identical to the initial post-deployment health assessment. If a service member indicates through these self-reporting screening procedures they may have experienced a TBI, a primary care provider conducts a confirmation evaluation, documentation is made in the patient's electronic medical record and treatment is started for those with persistent symptoms.

Management of TBI

When service members are involved in an event in-theater that may have caused a TBI, they are required to follow mandatory rest periods to prevent a second TBI from occurring close in time to their initial concussion. Neurologists are also available in-theater to advise on difficult cases. An electronic consulting service has been established for providers in-theater to work directly with TBI subject matter experts. This service is open to all providers in all services and answers are normally provided within four hours of the original consult.

DVBIC has established a care coordination network to identify all service members diagnosed with a TBI who are medically evacuated from theater. A care coordinator contacts the service members once they reach the United States and again at three, six, 12 and 24 months following their injury. The care coordinator assesses what further resources the service member may need and determines if there are other issues which may indicate the need for additional follow-up care.

In response to the FY 2008 National Defense Authorization Act, the Assistant Secretary of Defense for

Health Affairs directed baseline pre-deployment neurocognitive testing to begin. The primary objective of this testing is to better inform return-to-duty determinations in-theater following a possible TBI by comparing baseline pre-injury scores to post-injury scores. Currently, the **Automated Neuropsychological Assessment Metrics** (ANAM) is the main testing tool the Defense Department uses.

When service members experience a TBI in the United States, they receive care in the primary care setting while remaining at their home duty stations. Referrals are made to TBI specialists when warranted. Service members also receive care focused heavily on rehabilitation and reintegration in settings such as Defense Department TBI centers, Veterans Affairs polytrauma rehabilitation centers and civilian rehabilitation programs.

The Future

The Defense Department TBI research portfolio has grown reflecting the department's understanding of these injuries, which will translate into improved clinical care and outcomes. TBI research continues to be fast tracked to assist our service members in improved care in collaboration with the line, medical and research communities. The Defense Department will continue to provide a continuum of TBI screening and care from in-theater to post-deployment, including transitions to Veterans Affairs, ensuring the military health system properly screens and cares for service members with TBI.

TBI Resources for Providers and Patients

- **Mild Traumatic Brain Injury Pocket Guide** (for use within the United States) — Gives primary care providers an all-encompassing, quick reference that includes clinical guidance in assessing and treating service members and veterans who have sustained a mild TBI. It is intended for patients over the age of 18, diagnosed with mild TBI and complaining of symptoms related to the injury.
- **The Center of Excellence for Medical Multimedia Traumatic Brain Injury Website** — Provides an informative and sensitive exploration of TBI, including information for patients, family members and caregivers. Topics include types and symptoms of brain injury, TBI treatment and recovery and helpful insights about the potential long-term effects of brain injury. Survivors and their caregivers share courageous stories about their own experiences, providing down-to-earth facts along with inspiration and hope.
- **Family Caregiver Curriculum** — Provides a comprehensive guide for families providing care to a family member living with TBI.
- **DCoE Outreach Center** — Provides 24/7 support to service members, veterans, family members, providers and unit leaders and can be reached by calling toll-free 866-966-1020.
- **DoD Driver Rehabilitation Services and VA Driver Rehabilitation Centers** — Provides lists of driving centers around the country offering rehabilitation training to assist service members in driving again.
- **Driving Following Traumatic Brain Injury: Clinical Recommendations** — A 16-page document providing clinical recommendations to health care professionals within the military health system to assess the ability to drive following a TBI, regardless of severity.
- **Driving Following TBI** — A one-page summary of the above report on clinical recommendations for driving following TBI.
- **Five Things You Need to Know About Concussion (powerpoint version or PDF)** — Provides advice to service members about the basics of mild TBI, including symptoms.
- **A Summary of Clinical Recommendations from a 2009 Consensus Conference** — Provides guidance regarding cognitive rehabilitation of chronic post-concussive symptoms in service members and veterans receiving treatment within military medical settings.
- **Tips for Civilian Health Care Providers** — Provides checklists and resources for civilian health care providers treating service members with mild TBI and post-traumatic stress disorder.
- **VA/DoD Clinical Practice Guideline for Management of Concussion/mild TBI** — A 112- page report for health care providers.
- **Summary of VA/DoD Clinical Practice Guideline for Management of Concussion/mild TBI** — A 69-page summary of the above report.
- **Information Sheet Summarizing VA/DoD Clinical Practice Guideline for Management of Concussion/mild TBI** — A two-page summary of the above report.

RESOURCES FOR RECOVERY

FOR PROVIDERS

Advancing the Health and Care of our Nation's Combat Injured Service Members, their Families and Children

2010 BRAIN INJURY AWARENESS DAY ON CAPITOL HILL

The Impact of Traumatic Brain Injury (TBI) on Military Families and Children

An important and often forgotten aspect of TBI awareness is its impact on the children of the injured. TBI is unique because it often leads to changes in personality and behavior without altering one's physical appearance. This can be especially troubling and confusing for children, and embarrassing for the entire family.

Military families are extremely vulnerable to the effects of TBI due to its prevalence and range of severity in combat veterans. TBI is often referred to as the "signature wound" of our war on terrorism, the result of exposure to blast, gunshot wounds and shrapnel, falls and motor vehicle accidents. In addition to combat, many TBI injuries can occur in garrison during training exercises. TBI can be mild (referred to as mTBI or concussion), moderate or severe. Even in milder forms, when combat veterans say that they are "fine" they may exhibit changes in their personality or behavior. With more serious TBI, often occurring with complex war injuries, there can be profound changes in personality or behaviors, such as inappropriate outbursts, anger, social withdrawal, apathy, or depression.

Injuries such as TBI affect parenting when both the injured and the non-injured spouse struggle to adapt to changes in personality, family relationships and routines. Being less emotionally or physically available, or less consistent and predictable, can have short and long term consequences for children. Despite limited research on the impact of TBI on children, clinical case studies, focus groups, and small samples have shown that their responses to parental TBI are variable, and may involve the following:

Impact of TBI on Children

- Increased acting out behaviors, such as disobedience, tantrums, or risk-taking behaviors
- Emotional distress, such as crying, increased anxiety, or withdrawal
- Feelings of loss and grief related to the change in the injured parent
- Feelings of isolation
- Taking on additional responsibilities, such as caring for younger children, household tasks, and caring for the injured parent
- Feelings of embarrassment about the injured parent's appearance or behavior
- Misinterpreting parent TBI-related fatigue and apathy as indicators that the parent no longer loves them
- Feelings of anger or resentment about new responsibilities or changes in the family
- Feelings of self-blame for the injured parents's irritability

Family support professionals and stakeholders need to provide services and outreach that fosters family functioning during injury recovery.

How Families Can Help Children Integrate the Injury Experience within a Family Context

It is important for families to:

1. Seek out ***resources and instrumental support.*** As families deal with the adjustment to having a changed parent, families may need help in ensuring that basic needs are met in the areas of work and finance, medical care, military concerns, housing, education, and child care. Children may need special services or support to address behavioral/mental health problems that develop or to connect them with community resources (e.g., sports organizations, educational programs, or boy/girl scouts) that provide them with social support and structured activities.
2. Support children by helping them monitor changes or extremes in their emotional states and ***reduce emotional distress.*** As children deal with stress, they may find it difficult to express emotions, to relax, or to calm themselves. Parents can help children by teaching them to label and express their emotions and by giving them specific strategies (such as deep/belly breathing, progressive muscle relaxation, or visualizing a safe space) for dealing with strong emotions and/or stress.
3. ***Share information with children*** about the injury in a way they can comprehend it. Particularly important is information that helps children understand what the injury is, what the effects of the injury are in terms of parent

Resources for Recovery is developed by the Center for the Study of Traumatic Stress (CSTS). CSTS is part of the Department of Psychiatry, Uniformed Services University, and a partnering center of the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury.

functioning and/or symptoms, and what to expect over time. Children may need reassurance that the injury is not their fault and that specific symptoms/emotional changes in the parent are expected. This helps to normalize and contextualize the family's current difficulties and helps children understand what is happening in their family.

4. ***Talk about the injury*** with each other and others in the community, including health care and community service providers.. Children should be encouraged to ask questions about the injury among family members and with medical providers, and they should be encouraged to talk about the injury with people they trust (e.g., other family members, close friends, and/or teachers). Children should be encouraged to talk about what they experience and feel so that their concerns can be better understood and addressed.
5. ***Develop problem solving skills.*** Particularly important is helping children identify relevant problems, name their goals, brainstorm possible solutions, and pick a solution to try out. This helps children break down problems into manageable parts and gives them the tools they need to plan for future challenges.
6. Engage in ***shared family goal setting***. Goal setting helps family members prioritize what is most important and to consider what activities they would like to try sooner. Parents and children can select family goals together and practice them as they plan for future fun or challenges, recognizing incremental improvements over time.
7. Remember that adjusting to life with TBI can take time. Families should ***be patient and hopeful*** as they learn to live with the changes that result from the injury. While family life can change, parents and children can learn new ways of being together and enjoying each other.

Resources:

Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury
http://www.dcoe.health.mil/default.aspx

Defense and Veterans Brain Injury Center
http://www.dvbic.org/

Military OneSource
www.militaryonesource.com

Center for the Study of Traumatic Stress (CSTS)
Department of Psychiatry, Uniformed Services University of the Health Sciences
4301 Jones Bridge Road, Bethesda, MD 20814-4799
Tel: 301-295-2470 | Fax: 301-319-6965
www.usuhs.mil/csts | www.CSTSonline.org

CSTS is a partnering center of the Defense Center of Excellence for Psychological Health and Traumatic Brain Injury, and A component site of the National Child Traumatic Stress Network

DEFENSE CENTERS OF EXCELLENCE
For Psychological Health & Traumatic Brain Injury

Co-occurring Conditions Toolkit: Mild Traumatic Brain Injury and Psychological Health

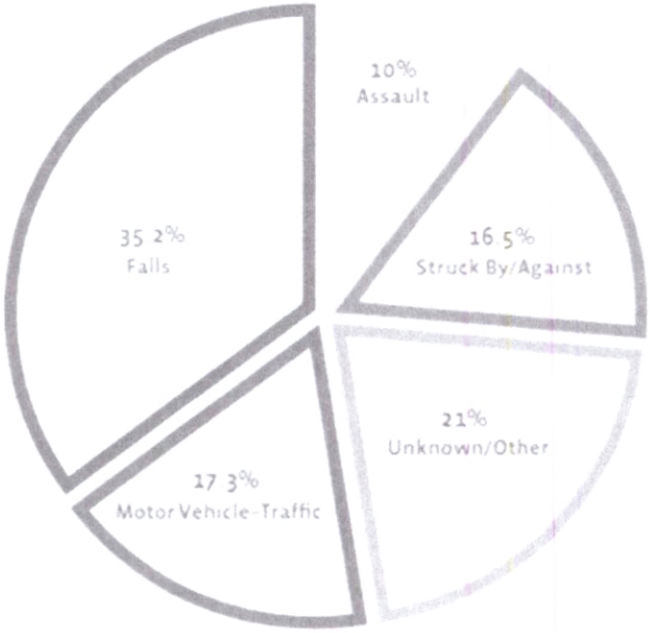
Concussion, Post-traumatic Stress, Depression, Chronic Pain, Headache, Substance Use Disorder

Revised September 2011
Second Edition

Back-ground
The First Appt.
How to Use this Guide
Sleep
Mood
Attention
Chronic Pain
App I Meds
App II Patient Education
App III Provider Resources

$3

What are the Leading Causes of TBI?



The leading causes of TBI are:

- Falls (35.2%);
- Motor vehicle – traffic (17.3%);
- Struck by/against events (16.5%); and
- Assaults (10%).[1]

Falls[1]

- Falls continued to be the leading cause of TBI (35.2%) in the United States. Falls cause half (50%) of the TBIs among children aged 0 to 14 years and 61% of all TBIs among adults aged 65 years and older.

Motor Vehicle-Traffic Crashes[1]

- Among all age groups, motor vehicle crashes and traffic-related incidents were the second leading cause of TBI (17.3%) and resulted in the largest percentage of TBI-related deaths (31.8%).

Learn more about:

- Preventing older adult falls
  - General information (/HomeandRecreationalSafety/Falls/index.html)
  - Preventing fall-related TBIs among older adults (/traumaticbraininjury/seniors.html)
- Motor vehicle safety (/Motorvehiclesafety/index.html) and Advanced Automatic Collision Notification (/injuryresponse/aacn.html)
- Preventing sports-related TBI in children and teens (/concussion/sports/index.html)

Struck By/Against Events[1]

- Struck by/against events, which include colliding with a moving or stationary object, were the second leading cause of TBI among children aged 0 to 14 years, with 25%.

Assault[1]

- Assaults produced 10% of TBIs in the general population; they accounted for only 2.9% in children aged 0 to 14 years and 1% in adults aged 65 years old and older.

Who is at Risk?

- Approximately 18% of all TBI-related emergency department visits involved children aged 0 to 4 years.
- Approximately 22% of all TBI-related hospitalizations involved adults aged 75 years and older.
- Males are more often diagnosed with a TBI (59%).

Blasts are a leading cause of TBI for active duty military personnel in war zones.[2] CDC estimates of TBI do not include injuries seen at U.S. Department of Defense or U.S. Veterans Health Administration Hospitals. For more information about TBI in the military including an interactive website for service members, veterans, and families and caregivers, please visit: www.TraumaticBrainInjuryAtoZ.org. (http://www.TraumaticBrainInjuryAtoZ.org)

References

1. Faul M, Xu L, Wald MM, Coronado VG. Traumatic brain injury in the United States: emergency department visits, hospitalizations, and deaths. Atlanta (GA): Centers for Disease Control and Prevention, National Center for Injury Prevention and Control; 2010
2. Champion HR, Holcomb JB, Young LA. Injuries from explosions. *Journal of Trauma* 2009;66(5):1468–1476.

Related Links

- *Traumatic Brain Injury in the United States: Emergency Department Visits, Hospitalizations and Deaths 2002 – 2006 (/traumaticbraininjury/tbi_ed.html)*
- *State Injury Indicators Report Fourth Edition—2005 Data* (http://apps.nccd.cdc.gov/DACH_SII/Resources/201699-A_InjuryIndicatorsReport_LowRes.pdf)

Page last reviewed: June 15, 2010
Page last updated: June 15, 2010
Content source: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control

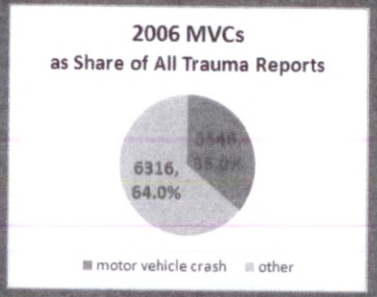
---

Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348, New Hours of Operation 8am-8pm ET/Monday-Friday
Closed Holidays - cdcinfo@cdc.gov

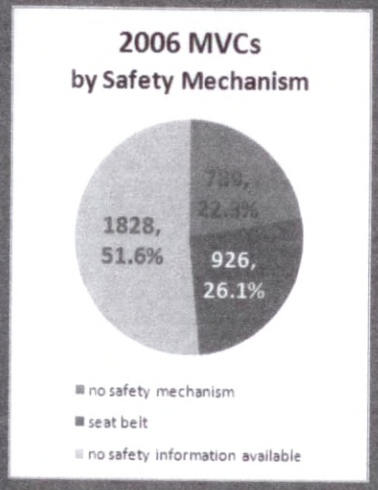
USA.gov Government Made Easy

Spotlight on Motor Vehicle Crashes

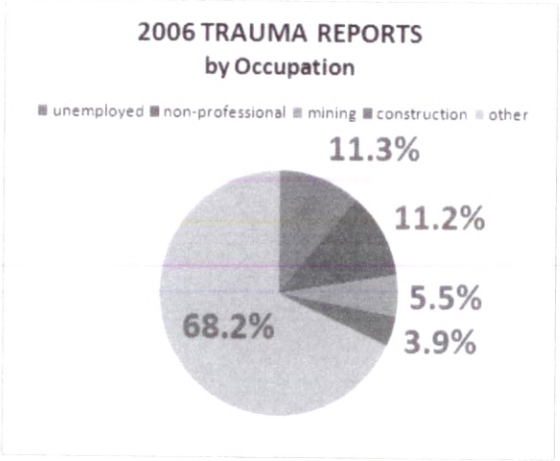
In 2006, motor vehicle crashes (MVCs) continued to be the leading cause of traumatic injury in Nevada, accounting for 36.0% (3,546) of all submissions.



Furthermore, 22.3% (789) of those injured in an MVC employed no safety mechanism, while 26.1% (926) used a safety belt. For the remainder, no safety information was reported.



Of the top four occupational categories of those involved in traumas reported, the unemployed accounted for the largest share at 11.3% (1,110), followed closely by non-professionals at 11.2% (1,105). The next two groups were mining, 5.5% (541), and construction, 3.9% (383), both of which entail significant occupational hazard.



For additional information, visit the Health Division website at: http://www.health.nv.gov/ or contact Andrea Rivers:

Phone: (775) 684-5912
E-mail: arrivers@health.nv.gov

The Nevada State Trauma Registry is operated pursuant to: NRS 450B.238 and NAC 450B.764

Nevada State Health Division

Bureau of Health Statistics, Planning, and Emergency Response
Office of Health Statistics and Surveillance

4150 Technology Way
Carson City NV 89706

Nevada State Health Division

2006 Trauma Fact Sheet

March 2009

2006
Trauma Fact Sheet

General

A trauma is a violent physical injury due to a blunt or penetrating force, burn, fracture, etc.. In 2006, the Nevada State Trauma Registry received 9,862 submissions from 27 of the 32 licensed hospitals in Nevada. The four designated trauma centers accounted for 86% (8,462) of the total.

On average, 822 submissions were received per month. July saw the largest number of submissions, 979 (9.9%), while the least occurred in November, 702 (7.1%). Saturday was the most frequently reported day for a trauma to occur (19.2%), followed by Sunday (18.0%). The least reported day was Wednesday (11.2%).

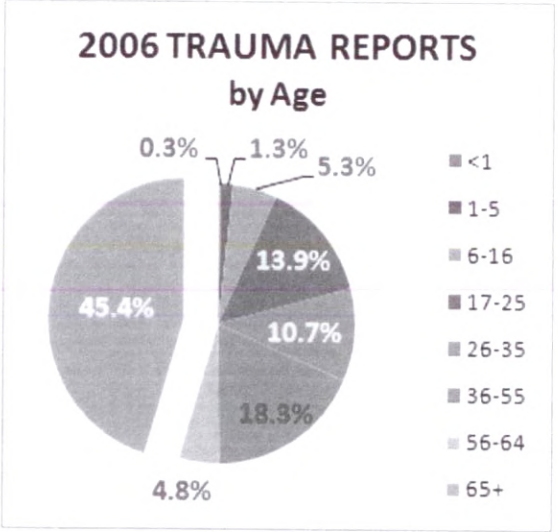
With 6,564 reports, street or highway was the most commonly reported site of injury, accounting for two-thirds (66.6%) of all submissions. While many submissions did not document the mode of transportation, 7.1% (698) of all submissions indicated that the patient had arrived at the emergency room by private vehicle or walk-in and 5.2% (517) noted arrival by ambulance.

Over half (58.9%) of the patients were admitted to a hospital for five or fewer days, and 59.6% were ultimately given a hospital disposition of home without further care. Death was the outcome for 3.1% (306) of all reports received.

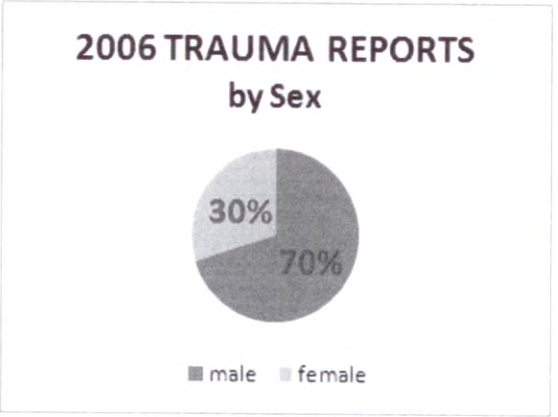
There are two categories of trauma reports: blunt force and penetrating. Blunt force was the most commonly reported type at 83.7% (8,257), while penetrating accounted for the remainder at 16.3% (1,605).

Demographic

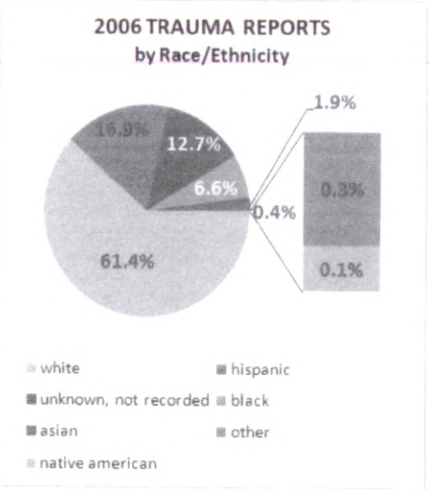
In 2006, those age 65 and older accounted for 45.4% (4,478) of all traumas reported, followed by those age 36 to 55 at 18.3% (1,801). The age group with the fewest submissions was for those less than 1 year of age, with only 32 submissions.



There was also a marked difference between the sexes in the number of submissions, with traumatic incidents involving males occurring over two times more often than females. Overall, males accounted for 70.0% (6,903) of the total number of submissions while females accounted for 29.9% (2,953).



Whites accounted for 61.4% (6,059) of trauma cases and Blacks 6.6% (655), both of which closely parallel 2006 population estimates of 61.3% and 6.9% respectively. However, the shares of trauma cases reported for Hispanics, Asians, and Native Americans were lower than their corresponding demographic estimates. In particular, Hispanics are estimated to constitute 24.0% of the populace, but their share of the reported trauma cases was 16.9%. Such discrepancies may be due in part to the large portion of trauma cases (12.7%) where racial and ethnic information was either unknown or not recorded.



(Continued on Brochure Back.)

What is a Trauma?

According to National Trauma Data Bank criteria, for an injury to be reported as a trauma, it must have at least one ICD-9 code from the following ranges: 800—904.99, 925—929.99, or 940—959.99, and the patient must haven either: been admitted to a facility, died following treatment or evaluation, or been transferred into or out of a facility.

Nevada Department of Health and Human Services
Nevada State Health Division

Search

TRAUMA REGISTRY
Nevada State Health Home
Trauma Home
HSPER
Contacts
Criteria (pdf)
Links
Data Collection Forms
NAC/NRS
.... NAC 450B.768
.... NRS 450B.768
Submission Due Dates (pdf)
Trauma Factsheet (pdf)

FREQUENT VISITS
- Birth and Death Certificates
- Employment Information
- Forms Publication Index
  - Forms
  - Publications
- Health Facility Locator
- Laboratory Personnel Certification
- Nevada Interactive Health Databases
- HMO Profiles
- Hospital Compare
- Medical Marijuana Program
- Sitemap

Sunday, November 13th 2011

Last Updated: 09/30/11 08:09:38 AM

Trauma Facts

- In 2006, motor vehicle crashes (MVCs) continued to be the leading cause of traumatic injury in Nevada, accounting for 36% (3,546) of all submissions.
- In 2006, those age 65 and older accounted for 45.4% (4,478) of all traumas reported, followed by those age 36-55 at 18.3% (1,801). The age group with the fewest submissions was for those less than one year of age, with only 32 submissions.
- Please visit the recently published Trauma Factsheet for further trauma facts.

Trauma Registry

- Pursuant to NRS 450B.238, and NAC 450B.768, the Nevada Trauma Registry (NTR) was established in 1987, to collect data on persons who sustain a physical (blunt or penetrating) injury caused by an accident or by violence.
- The NTR data are collected from all licensed acute care hospitals and trauma centers in Nevada.
- According to National Trauma Data Bank criteria, for an injury to be reported as a trauma, it must have at least one ICD-9 code from the following ranges: 800-904.99, 925-929.99, or 940-959.99, and the patient must have either:
  - been admitted to a facility,
  - **or** died following treatment or evaluation,
  - or been transferred into or out of a facility.
- The NTR currently utilizes the National Trauma Registry of the American College of Surgeons (NTRACS) software to collect, store and report information related to traumatic injuries in Nevada. Included (but not limited to) are data on the event causing the injury, severity of the injury, place of the injury, length of hospital stay, diagnosis(es) of the patient, discharge destination of the patient and payer source.
- The NTR can provide information on the incidence, and prevalence,

WHAT'S NEW

NEW
Nevada Comprehensive Cancer Plan 2011-2015 (pdf)

NEW
Early Intervention Cost Analysis

Immunize Nevada

One and Only Campaign Sept. 2011 Newsletter

A Patient's Guide to Choosing a Doctor

A Patient's Guide to Infection Control at the Doctor's Office

Music Therapist Application

Verification of Board Certification & Education for Music Therapists

Civil Applicant Waiver

2011 Nevada Comprehensive Profile For Stroke Prevention

2010 Annual Sentinel Event Summary Report

Pertussis Vaccine Use in ER/UC

Legislative Briefings 2011

Division Budget Presentation January 27, 2011

Special Report: Norovirus in Long Term Care Facilities

morbidity, and mortality of injuries in Nevada. The data can be broken down to a specific county, specific hospital, specific race, or specific age group, for example. These data are available for state, private or federal entities, grant applicants to measure the impact of trauma on Nevada and initiate health education programs that address traumatic injuries.

Triad Alcohol Prep Pads, Alcohol Swabs, and Alcohol Swabsticks

Insulin Pen Information

2009 Annual Hospitals Report

Request for Information (RFI)

Healthcare Associated Infection Plan

Near Miss Study

2009 Annual Sentinel Event Summary Report

To find a family planning clinic, click here

What's new, click here

JOB OPPORTUNITIES

Click here.

WASH YOUR HANDS

- Wash Your Hands - English (wmv)
- Wash Your Hands - Spanish (wmv)

MEETINGS/WORKSHOPS

Scheduled Meetings

Proposed Regulations/

Public Workshops

RECENT PUBLICATIONS

Click here.

ONE & ONLY CAMPAIGN

CONSUMER INFORMATION

Salmonella Enteritidis

FDA: Temporary suspension of Rotarix vaccine

Salmonella FAQ

Traumatic Brain Injury in Prisons and Jails:

An Unrecognized Problem

Many people in prisons and jails are living with traumatic brain injury (TBI)-related problems that complicate their management and treatment while they are incarcerated. Because most prisoners will be released, these problems will also pose challenges when they return to the community. The Centers for Disease Control and Prevention (CDC) recognizes TBI in prisons and jails as an important public health problem.

What is known about TBI and related problems in prisons and jails?

General:

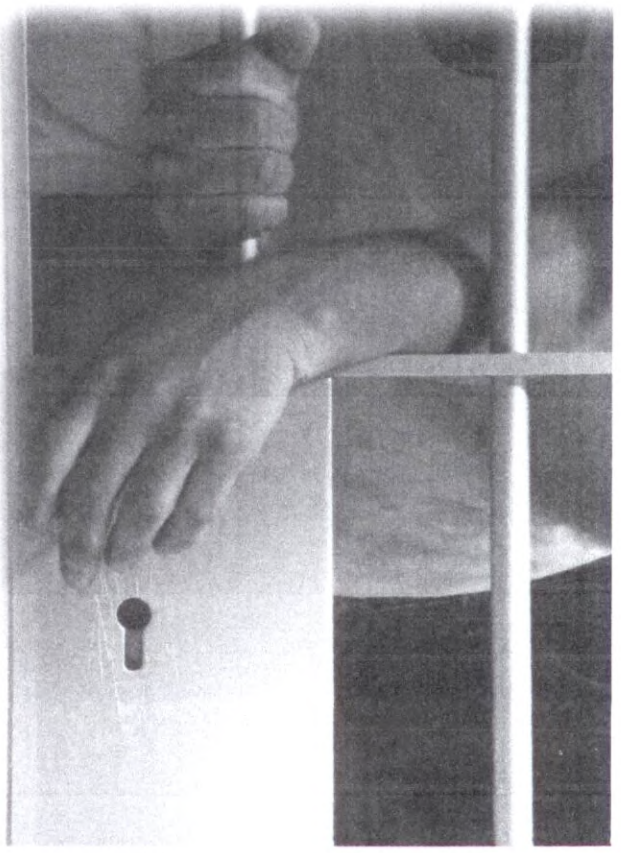
- More than two million people currently reside in U.S. prisons and jails.[1]
- According to jail and prison studies, 25-87% of inmates report having experienced a head injury or TBI [2-4] as compared to 8.5% in a general population reporting a history of TBI.[5]
- Prisoners who have had head injuries may also experience mental health problems such as severe depression and anxiety,[3] substance use disorders,[6-8] difficulty controlling anger,[6] or suicidal thoughts and/or attempts.[6,9]

Women:

- Although women are outnumbered by men in U.S. prisons and jails, their numbers more than doubled from 1990 to 2000.[1,10] As of June 2005, more than 200,000 women were incarcerated.[1] Women now represent 7% of the total U.S. prison population and 12% of the total U.S. jail population.[10]
- Women inmates who are convicted of a violent crime are more likely to have sustained a pre-crime TBI and/or some other form of physical abuse.[11]
- Women with substance use disorders have an increased risk for TBI compared with other women in the general U.S. population.[12]
- Preliminary results from one study suggest that TBI among women in prison is very common.[13]

Substance abuse, violence, and homelessness:

- Studies of prisoners' self-reported health indicate that those with one or more head injuries have significantly higher levels of alcohol and/or drug use during the year preceding their current incarceration.[6]
- The U.S. Department of Justice has reported that 52% of female offenders and 41% of male offenders are under the influence of drugs, alcohol, or both at the



time of their arrest,[14] and that 64% of male arrestees tested positive for at least one of five illicit drugs [cocaine, opioids, marijuana, methamphetamines, or PCP].[15]
- Among male prisoners, a history of TBI is strongly associated with perpetration of domestic and other kinds of violence.[16]
- Children and teenagers who have been convicted of a crime are more likely to have had a pre-crime TBI[17,18] and/or some other kind of physical abuse.[17,19,20]
- Homelessness has been found to be related to both head injury[21] and prior imprisonment.[22]

How do TBI-related problems affect prisoners with TBI and others during their incarceration?

A TBI may cause many different problems:

- Attention deficits may make it difficult for the prisoner with TBI to focus on a required task or respond to directions given by a correctional officer. Either situation may be misinterpreted, thus leading to an impression of deliberate defiance on the part of the prisoner.[2,23]
- Memory deficits can make it difficult to understand or remember rules or directions, which can lead to disciplinary actions by jail or prison staff.[24]
- Irritability or anger might be difficult to control and can lead to an incident with another prisoner or correctional officer and to further injury for the person and others.[23,25]
- Slowed verbal and physical responses may be interpreted by correctional officers as uncooperative behavior.[23]
- Uninhibited or impulsive behavior, including problems controlling anger[6] and unacceptable sexual behavior, may provoke other prisoners or result in disciplinary action by jail or prison staff.[23,26]

What is needed to address the problem of TBI in jails and prisons?

A recent report from the Commission on Safety and Abuse in America's Prisons recommends increased health screenings, evaluations, and treatment for inmates.[27]

In addition, TBI experts and some prison officials have suggested:

- Routine screening of jail and prison inmates to identify a history of TBI.[28,29]
- Screening inmates with TBI for possible alcohol and/or substance abuse and appropriate treatment for these co-occurring conditions.[15,30,31]
- Additional evaluations to identify specific TBI-related problems and determine how they should be managed.[28] Special attention should be given to impulsive behavior, including violence,[2,26] sexual behavior[23] and suicide risk if the inmate is depressed.[32]

What is needed to address TBI-related problems after release from jails and prisons?

Lack of treatment and rehabilitation for persons with mental health and substance abuse problems while incarcerated increases the probability that they will again abuse alcohol and/or drugs when released.[15,31] Persistent substance problems can lead to homelessness,[33] return to illegal drug activities,[34,35] re-arrest,[36] and increased risk of death[37] after release. As a result, criminal justice professionals and TBI experts have suggested the following:

- Community re-entry staff should be trained to identify a history of TBI and have access to appropriate consultation with other professionals with expertise in TBI.[17,29,30]
- Transition services for released persons returning to communities should accommodate the problems resulting from a TBI.[17,28,29]
- Released persons with mental health and/or substance abuse problems should receive case management services and assistance with placement into community treatment programs.[27,30,37]

CDC supports new research to develop better methods for identifying inmates with a history of TBI and related problems and for determining how many of them are living with such injury.

Further information is available from these websites:

Traumatic Brain Injury (TBI):
CDC, National Center for Injury Prevention and Control
www.cdc.gov/ncipc/tbi/TBI.htm

This site provides information for professionals and the general public regarding TBI. Topics include prevention, causes, outcomes, and research. Data reports regarding TBI in the United States and many free publications and fact sheets can be downloaded. Materials are available in English and Spanish.

Health Issues in Correctional Settings:
CDC, National Center for HIV, STD, and TB Prevention
www.cdc.gov/nchstp/od/cccwg/default.htm

This site provides information for public health and criminal justice professionals about health topics with an emphasis on infectious diseases in the correctional setting. It also has materials for the general public with links to related organizations.

Intimate Partner Violence (IPV):
CDC, National Center for Injury Prevention and Control
www.cdc.gov/ncipc/factsheets/ipvfacts.htm

The site provides information for professionals and the general public regarding IPV. The site contains an overview and fact sheet about IPV, prevention strategies, links to other IPV prevention organizations, and a list of current CDC publications.

Legal Issues of Persons with TBI within Correctional Settings:
National Disability Rights Network
www.ndrn.org/aboutus/consumer.htm

This site provides information about the laws protecting the civil and human rights of persons with disabilities, including TBI. Incarcerated persons with disabilities, or their families, can receive help from the Network regarding prisoners' legal rights, access to mental health services and/or medication, and restoration of benefits upon release.

Substance Abuse:
Substance Abuse & Mental Health Services Administration
www.samhsa.gov

This site provides information about treatment resources for persons with, or at risk for, mental and/or substance abuse problems. Also, the site provides information for professionals regarding alcohol and other drug-related disorders. The site has materials for specific populations and age groups and hotline numbers for support organizations.

References

1. Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics. Prison and jail inmates at midyear 2005 [online] 2006 [cited 2006 May 22]. Available from URL: www.ojp.usdoj.gov/bjs/pub/pdf/pjim05.pdf.

2. Schofield PW, Butler TG, Hollis SJ, Smith NE, Lee SJ, Kelso WM. Traumatic brain injury among Australian prisoners: rates, recurrence and sequelae. *Brain Injury* 2006;20(5):499-506.

3. Slaughter B, Fann JR, Ehde D. Traumatic brain injury in a county jail population: prevalence, neuropsychological functioning and psychiatric disorders. *Brain Injury* 2003;17(9):731-41.

4. Morrell RF, Merbitz CT, Jain S, Jain, S. Traumatic brain injury in prisoners. *Journal of Offender Rehabilitation* 1998;27(3-4):1-8.

5. Silver JM, Kramer R, Greenwald S, Weissman M. The association between head injuries and psychiatric disorders: findings from the New Haven NIMH Epidemiologic Catchment Area Study. *Brain Injury* 2001;15:935-45

6. Walker R, Hiller M, Staton M, Leukefeld CG. Head injury among drug abusers: an indicator of co-occurring problems. *Journal of Psychoactive Drugs* 2003;35(3):343-53.

7. Barnfield TV, Leathem JM. Neuropsychological outcomes of traumatic brain injury and substance abuse in a New Zealand prison population. *Brain Injury* 1998;12(11):951-62.

8. Barnfield TV, Leathem JM. Incidence and outcomes of traumatic brain injury and substance abuse in a New Zealand prison population. *Brain Injury* 1998;12(6):455-66.

9. Blaauw E, Arensman E, Kraaij V, Winkel FW, Bout R. Traumatic life events and suicide risk among jail inmates: the influence of types of events, time period and significant others. *Journal of Traumatic Stress* 2002;15(1):9-16.

10. Womens' Prisons Association. Hard hit: the growth in the imprisonment of women, 1977-2004. Greene J, Pranis K, editors; New York; Women's Prison Association, [online]. 2006 [cited 2006 Aug 3]. Available from URL: www.wpaonline.org/institute/hardhit/part1.htm#np.

11. Brewer Smyth K, Burgess AW, Shults J. Physical and sexual abuse, salivary cortical, and neurologic correlates of violent criminal behavior in female prison inmates. *Biological Psychiatry* 2004;55(1):21-31.

12. Felde AB, Westermeyer J, Thuras P. Co-morbid traumatic brain injury and substance use disorder: childhood predictors and adult correlates. *Brain Injury* 2006;20(1):41-9.

13. Diamond P, Magaletta P. TBI in the Federal prison: assessing history of traumatic brain injury in a prison population. A lecture given at the National Center for Injury Prevention and Control. Centers for Disease Control and Prevention; February 17, 2006; Atlanta, GA.

14. Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics. Substance abuse and treatment, state and federal prisoners, 1997 [online]. 2001 [cited 2006 Nov 8]. Available from URL: www.ojp.usdoj.gov/bjs/pub/pdf/satsfp97.pdf.

15. Department of Health and Human Services (US), Substance Abuse and Mental Health Services Administration. Put prevention into practice. Rockville (MD): Department of Health and Human Services; 1998. Treatment Improvement Protocol (TIP) Series 44, DHHS Publication No. (SMA) 98-3249. [cited 2006 Aug 3]. Available from URL: www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat5.chapter.80044.

16. Cohen RA, Rosenbaum A, Kane RL, Warnken WJ, Benjamin S. Neuropsychological correlates of domestic violence. *Violence and Victims* 1999;14(4):397-411.

17. Leon-Carrion J, Ramos FJ. Blows to the head during development can predispose to violent criminal behaviour: rehabilitation of consequences of head injury is a measure for crime prevention. *Brain Injury* 2003;17(3):207-16.

18. Timonen M, Miettunen J, Hakko H, Zitting H, Veijola J, von Wendt LRP. The association of preceding traumatic brain injury with mental disorders, alcoholism and criminality: the Northern Finland 1966 Birth Cohort Study. *Psychiatry Research* 2002;113(3):217-26.

19. Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics. Women offenders [online]. 2000 [cited 2006 May 15]. Available from URL: www.ojp.usdoj.gov/bjs/abstract/wo.htm.

20. Yeager CA, Lewis DO. Mental illness, neuropsychologic deficits, child abuse, and violence. *Child & Adolescent Psychiatric Clinics of North America* 2000;9(4):793-813.

21. Bremner AJ, Duke PJ, Nelson HE, Pantelis C, Barnes TR. Cognitive function and duration of rooflessness in entrants to a hostel for homeless men. *British Journal of Psychiatry* 1996;169(4):434-439.

22. Kushel MB, Hahn JA, Evans JL, Bangsberg DR, Moss AR. Revolving doors: imprisonment among the homeless and marginally housed population. *American Journal of Public Health* 2005;95(10):1747-52.

23. Kaufman CW. Handbook for correction officers and other institutional staff to identify and manage inmates with traumatic brain injuries [dissertation]. Miami (FL): Carlos Albizu University 2001. Available from: University Microfilms, Ann Arbor, MI. (UMI No. AAT3040762).

24. Merbitz C, Jain S, Good GL, Jain A. Reported head injury and disciplinary rule infractions in prison. *Journal of Offender Rehabilitation* 1995;22(3-4):11-19.

25. Department of Justice (US), Office of Justice Programs, Bureau of Justice Statistics. Medical problems of inmates, 1997 [online]. 2001 [cited 2006 May 15]. Available from URL: www.ojp.usdoj.gov/bjs/abstract/mpi97.htm.

26. Young MH, Justice JV, Erdberg P. Assault in prison and assault in prison psychiatric treatment. *Journal of Forensic Science* 2004;49(1):1-9.

27. Commission on Safety and Abuse in America's Prisons. Gibbons JJ , Katzenbach NB, co-chairs. Confronting confinement [online]. 2006 [cited 2006 Jun 8]. Available from URL: www.prisoncommission.org.

28. Sarapata M, Herrmann D, Johnson T, Aycock R. The role of head injury in cognitive functioning, emotional adjustment and criminal behaviour. *Brain Injury* 1998;12(10):821-42.

29. Fowles GP. Neuropsychologically impaired offenders: considerations for assessment and treatment. *Psychiatric Annals* 1988;18(12):692-7.

30. Department of Health and Human Services (US), National Institutes of Health, National Institute on Drug Abuse. Principles of drug abuse treatment for criminal justice populations. Rockville (MD): National Institutes of Health; 2006.

31. Department of Health and Human Services (US), Substance Abuse and Mental Health Services Administration. Substance use disorder treatment for people with physical and cognitive disabilities. Rockville (MD): Department of Health and Human Services; 1998. Treatment Improvement Protocol (TIP) Series 29, DHHS Publication No. (SMA) 98-3249. [cited 2006 August 3]. Available from URL: www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat5.chapter.52487.

32. Cauffman E. A statewide screening of mental health symptoms among juvenile offenders in detention. *Journal of the American Academy of Child & Adolescent Psychiatry* 2004;43(4):430-9.

33. Department of Justice (US), Office of Justice Programs, National Institute of Justice. When prisoners return to the community: political, economic, and social consequences. Petersilia J, editor. Washington (DC): Department of Justice; 2000. Sentencing & Corrections. No 9, NCIJ 180775 [online] [cited 2006 Aug 3]. Available from URL: www.ncjrs.gov/pdffiles1/nij/184253.pdf.

34. Burdon WM, Messina NP, Prendergast ML. The California treatment expansion initiative: aftercare participation, recidivism, and predictors of outcomes. *Prison Journal* 2004;84(1):61-80.

35. Prendergast ML, Campos M, Farabee D, Evans WK, Martinez J. Reducing substance abuse in prison: the California Department of Corrections. *Prison Journal* 2004;84(2):265-80.

36. Coid J. Correctional populations: criminal careers and recidivism. Oldham JM, Skodol AE, Bender DS, editors. Textbook of Personality Disorders. Washington (DC): American Psychiatric Publishing; 2005. p. 579-606.

37. Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. Release from prison—a high risk of death for former inmates. *New England Journal of Medicine* 2007;356(2):157-65.

Traumatic Brain Injury in Prisons: A Review

Joanne M. McGee, PhD, ResCare Premier

The behavior of legal offenders is frequently met with consternation by the public. Many may ask, particularly when the crime is violent, "How could a person do something like that?" A very good question. The answer deserves serious consideration.

A recent story on PBS's Frontline, called "The New Asylums" (Fanning, 2005), documented a grave concern regarding the large number of mentally ill people who are serving time. While mental illness is not new, a growing population of individuals with traumatic brain injury (TBI) and associated problem behaviors is relatively new — prior to the 1970's the medical technology was not available to keep most individuals with a serious brain injury alive. Unfortunately now, many individuals with TBI are not only joining the ranks of the mentally ill in prisons and jails, but are becoming the ranks.

The Consequences of Brain Injury

Some of the 2 million individuals who sustain brain injury per year in the U.S. are able to return to their pre-injury level of functioning, for the most part. For some (47-53%), many of whom sustain severe brain injury, TBI is associated with an increased risk for irritability, temper outbursts and decreased self control (Mauss-Clum & Ryan, 1981), in addition to cognitive problems such as attention and memory. Brooks and colleagues (1986) found that five years after a severe brain injury, 64% were described as having a bad temper and 54% threatened violence. While a person may have been calm and controlled before their injury, afterwards they may become quick-tempered and lack inhibition. TBI also increases the risk for psychiatric disorders and substance abuse. Studies indicate that abusive experiences in a person's life tend to increase the inclination toward violence after brain impairment (Hatzitaskos, Lewis, Yeager, & Trujillo, 1994). While past experiences cannot be changed, the behavioral consequences of psychiatric and neuropsychological problems are often treatable with medical and behavioral interventions. However, unless the diagnostic question is investigated and the condition treated, an individual may pose a threat to others and themselves, and be at risk for incarceration.

Arrest Rates and Brain Injury

About 2% of the general population is arrested annually. In contrast, in their study of survivors five years after severe brain injury, Brooks and colleagues found that 31% had been in trouble with the law one or more times. A similar rate of arrest (one-third) was found in a community sample of children and adolescents with TBI (Luiselli, Arons, Marchese, Potoczny-Gray, & Rossi, 2000). At two years post-injury, Hall and colleagues (1994) found that 24% of their sample had been arrested for other than traffic violations and 18% had been incarcerated. For subjects who were receiving rehabilitation from an outpatient clinic, Kreutzer, Marwitz, and Witol (1995) found a lower rate of arrest post-injury of 7.2%.

Brain Injury on Death Row

In their 1986 uncontrolled study of 15 death row inmates in the U.S., Lewis, Pincus, Feldman, Jackson and Bard raised the question of what kinds of individuals are condemned to death. The sample was selected based upon the imminence of the executions and not because of obvious psychopathology: consequently, the sample

was felt to be representative of inmates awaiting execution in this country. The researchers found evidence of brain impairment in 100% of the cases. At the time of a subsequent study (Lewis, Pincus, Bard, Richardson, Prichep, Feldman, & Yeager, 1988), 37 juveniles were awaiting execution in the United States. Forty percent of the group were selected based upon imminence of their executions. All 14 juveniles in the sample had histories of head injury with associated signs of neurological dysfunction. There was also a history of physical and sexual abuse, family violence, and family psychiatric illness in both the adult and juvenile groups.

Sadly, while the findings were relevant to considerations of mitigation, they were not identified and presented in the trials, sentencing, or in the course of subsequent appeals. It is likely that no one suspected the existence of the condition. Contrary to the notion that murderers are just sociopaths who will try to appear mentally ill in order to avoid punishment, most of the subjects did not consider themselves sick or impaired and did not request evaluations. Additionally, there was a tendency among the offenders and their family members to minimize or conceal not only the violence and abusiveness experienced in the home, but they were unable to recognize the importance of psychiatric or neurological symptoms to their defense.

Freedman and Hemenway (2000) also point out that men on death row tend to have neurological, psychiatric and psychoeducational deficits. In their case-study analysis of the social and family histories of 16 men on death row, they found a history of brain impairment/mental illness in all cases (12 had a history of TBI). The strength of the study was the authors' ability to cross-validate the social and clinical information they obtained about their subjects. The authors emphasized that while most individuals who are mentally ill or who have brain impairment are not killers, a significantly higher proportion of people who kill have serious brain impairment and/or mental illnesses.

Brain Injury in Non-Death Row Corrections Programs

Given these alarming findings, other researchers have attempted to estimate the prevalence of brain injury in other corrections programs (not only those on death row). In their 1998 study of inmates in a New Zealand prison, Barnfield and Leathem found that 86.4% of the sample had sustained a TBI at some time in their lives. The subjects were volunteers and completed a self-report questionnaire.

Morrell, Merbitz, Jain, and Jain (1998) interviewed 1000 consecutively admitted offenders in a midwestern state prison system (with a range of offenses from possession of drugs to murder) and asked whether they had a history of head injury. Two hundred and forty-nine (24.9%) reported sustaining at least one head injury: 28 (3%) reported having sustained two or more. In a study conducted by Templer and colleagues (1992), 36% of 322 prisoners in a medium security prison reported TBI with a loss of consciousness during their lifetime.

Slaughter, Fann, and Ehde (2003) conducted standardized interviews with 69 randomly selected inmates in a county jail in Seattle, Washington. Eighty-seven percent of the subjects reported having had a TBI during their lifetime: 36.2% reported having had a TBI in the prior year. It was noted that those with a more recent injury presented with a higher prevalence of anger, aggression, cognitive problems, and psychiatric problems at the time of the evaluation than those who had been injured previously. The authors analyzed prevalence rates obtained in previous studies. Interestingly, the setting with the lowest prevalence of TBI (22%) was the forensic psychiatric hospital setting, compared to the general prison, death row, and a prison diversion program. In addition to recommendations for treatment and rehabilitation, the authors recommend that more comprehensive and accurate psychiatric forensic evaluations be conducted and that additional information be obtained for consideration in the mitigation phase of sentencing.

In contrast to studies that only included incarcerated individuals, Sarapata, Herrmann, Johnson, and Aycock (1998) administered a self-report questionnaire regarding history of brain injury to 34 participants in a community corrections Day Reporting program. A substantial percentage of offenders (50%) reported having a history of brain injury compared to a non-offender control group (15%). It might be suggested that individuals who are prone to criminal behavior also are prone to high-risk behavior that might lead to brain injury. The authors found that for some participants this was the case, however, 83% of the head-injured offenders reported a date for their brain injury that preceded the date they reported for their first criminal activity.

It does appear from the results, as varied as they are, that head injury is much more prevalent in prisoners compared to the general population (2-5%). Many of the authors in the above studies recognized the need to interpret the results with caution due to the fact that the data in some studies was gathered through self-report. Extensive and repeated questioning is often needed to allow subjects with memory problems to recall the extent of past injuries. Additionally, if the injury occurred very early in life (e.g., due to child abuse), the subject may have never known of the event. Consequently, it is possible that there is an under-estimation of the prevalence of TBI in the studies described above. Conversely, the results may also reflect a tendency of prisoners to over-report a history of brain injury.

The lack of a reliable, valid and efficient assessment instrument for use in identifying individuals with TBI in prison has led Diamond and colleagues at the University of Texas at Houston to seek support from the CDC in developing such a procedure (National Center for Injury Prevention and Control, n.d.). Additionally, the researchers will develop a proposal for assessing the prevalence of TBI among the federal prison inmate population.

Conclusion

In summary, based upon the results of preliminary studies, a striking number of offenders in the criminal justice system are neurologically impaired. The data also suggests that individuals with brain injury engage in crime more often than they would have if they had not had a brain injury.

The findings have important implications for the health care community, the legal community and the community at large. As Winslade (2003) pointed out, "The scientific community should give closer scrutiny to the connections between brain injury and behavior, not only to assist the legal system in assigning criminal responsibility, but also to help discover better ways to help persons with brain injuries to regain control of their impulses and their conduct." Additionally, according to Sarapato et al. (1998), it is incumbent upon our society to aggressively treat children and adolescents with head injury so as to help them avoid a life of crime.

There is an urgent need to consider the impact of the lack of services for TBI on the individual and the community. While widespread services are available for other disability conditions in the community, the ongoing cognitive/behavioral problems associated with TBI are excluded from community support services. At a minimum, the findings above have important implications for on-going case management past the acute/post-acute stages of rehabilitation, particularly when individuals return to the community setting.

Dr. Joanne McGee is the Clinical Director of ResCare Premier's rehabilitation program for brain injury in San Marcos, Texas. She is a licensed neuropsychologist, licensed specialist in school psychology, and managing editor for Premier Outlook.

References

Barnfield, T. V., & Leathem, J. M. (1998). Incidence and outcomes of traumatic brain injury and substance abuse in a New Zealand prison population. *Brain Injury*, 12(6), 455-466.

Brooks, N., Campsie, L., Symington, C., et al. (1988). The five year outcome of severe blunt head injury: A relative's view. *Journal of Neurology, Neurosurgery, and Psychiatry*, 49, 764-770.

Fanning, D. (Executive Producer). (2005). *Frontline: The new asylums* [Television broadcast]. New York and Washington, DC: Public Broadcasting Service.

Freedman, D., & Hemenway, D. (2000). Precursors to lethal violence: A death row sample. *Social Science & Medicine*, 50, 1757-1770.

Hall, K., Karzmark, P., Stevens, M., et al. (1994). Family stressors in traumatic brain injury: A two-year follow-up. *Archives of Physical Medicine and Rehabilitation*, 75, 876-884.

Hatzitaskos, P., Lewis, D. O., Yeager, C. A., & Trujillo, K. (1994). The documentation of central nervous system insults in violent offenders. *Juvenile and Family Court Journal*, 45, 29-33.

Kreutzer, J. S., Marwitz, J. H., & Witol, A. D. (1995). Interrelationships between crime, substance abuse, and aggressive behaviours among persons with traumatic brain injury. *Brain Injury*, 9(8), 757-768.

Lewis, D. O., Pincus, J. H., Feldman, M., Jackson, L., & Bard, B. (1986). Psychiatric, neurological, and psychoeducational characteristics of 15 death row inmates in the United States. *American Journal of Psychiatry*, 143(7), 838-845.

Lewis, D. O., Pincus, J. H., Bard, B., Richardson, E., Prichep, L. S., Feldman, M., & Yeager, C. (1988). Neuropsychiatric, psychoeducational, and family characteristics of 14 juveniles condemned to death in the United States. *American Journal of Psychiatry*, 145(5), 584-589.

Luiselli, J. K., Arons, M., Marchese, N., Potoczny-Gray, A., & Rossi, E. (2000). Incidence of law-violating behavior in a community sample of children and adolescents with traumatic brain injury. *International Journal of Offender Therapy and Comparative Criminology*, 44(6), 647-656.

Mauss-Clum, N., & Ryan, M. (1981). Brain injury and the family. *Journal of Nursing*, 13, 165-169.

Morrell, R. F., Merbitz, C. T., Jain, S., & Jain, S. (1998). Traumatic brain injury in prisoners. *Journal of Offender Rehabilitation*, 27(3/4), 1-8.

National Center for Injury Prevention and Control (n.d.). Division of injury and disability outcomes and programs (DIDOP) research cooperative agreements: Studies to determine the prevalence of a history of traumatic brain injury (TBI) in an institutionalized population.

Sarapata, M., Herrmann, D., Johnson, T., & Aycock, R. (1998). The role of head injury in cognitive functioning, emotional adjustment and criminal behaviour. *Brain Injury*, 12 (10), 821-842.

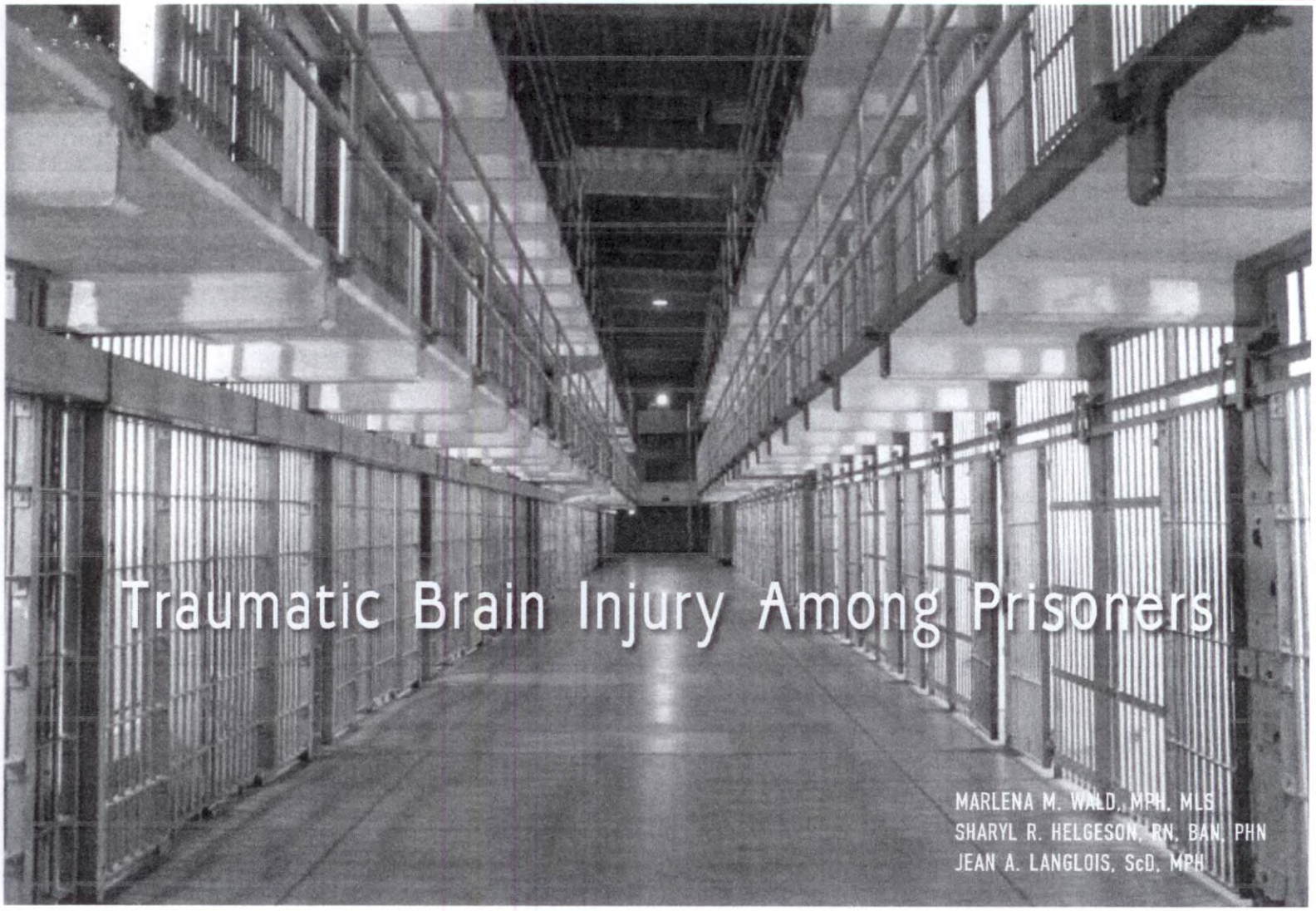
Slaughter, B., Fann, J. R., & Ehde, D. (2003). Traumatic brain injury in a county jail population: Prevalence,

neuropsychological functioning and psychiatric disorders. *Brain Injury*, 17 (9), 731-741.

Templer, D. I., Kasiraj, J., Trent, N. H., et al. (1992). Exploration of head injury without medical attention. *Perceptual and Motor Skills*, 75, 195-202.

Winslade, W. J. (2003). Traumatic brain injury and criminal responsibility.

From ResCare Premier. Used with permission. Third-party use prohibited. www.rescarepremiertexas.com.



Traumatic Brain Injury Among Prisoners

MARLENA M. WALD, MPH, MLS
SHARYL R. HELGESON, RN, BAN, PHN
JEAN A. LANGLOIS, ScD, MPH

Acknowledgments

The authors thank Heather Day and Jon Roesler from the Minnesota Department of Health for their assistance in analyzing the data, and Steven Allen and Ken Carlson of the Minnesota Department of Corrections, John Corrigan, and Pamela Diamond for their contributions to this work.

Disclaimer

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Background

Approximately 2.2 million people are currently in US prisons and jails (DOJ 2006). Although women account for about 8% of those incarcerated (DOJ 2006), from 1990 to 2000 the number of women in prisons and jails more than doubled (DOJ 2006). Ensuring the successful community re-integration of prisoners is of concern since approximately 95% of people incarcerated in jail or prison will be released at some point (Commission Report, 2006).

Prevalence and causes of TBI among prisoners

The impact of traumatic brain injury (TBI) in the prison setting has not been well-recognized but is potentially quite great. Previous studies suggest that a history of TBI is common among inmates, including women, occurring among an estimated 25-87% of the jail and prison population (Figure 1). In contrast, it is estimated that 8.5% of non-incarcerated adults report a history of TBI (Silver et al, 2001). These data suggest that the prevalence of a TBI history may be as high as 10 times that of the general population.

Some more recent findings shed new light on the epidemiology of TBI among prisoners. In a recent survey conducted among male state prisoners in Minnesota, a history of having head injury was assessed using the Traumatic Brain Injury Questionnaire (TBIQ) (Diamond et al., 2007). Of the 998 inmates assessed, 82.8% reported having had one or more head injuries during their lifetime, which is consistent with a previous study (Slaughter et al., 2003). The majority were reportedly caused by assaults, followed by automobile crashes and sports (Figure 2). Of note, some of the specific causes of assault-related TBI among prisoners are unique. For example, in the Minnesota project, some of the reported head injuries among incarcerated gang members were the result of a gang initiation procedure called "pumpkinhead" in which new gang members are beaten until their heads swell "like pumpkins." Also, anecdotal reports from corrections officials in South Carolina indicate that self-inflicted TBIs occur when inmates purposely knock their heads against the bars or the cell floor until they become unconscious. This usually happens when inmates are moved to isolated cells (Anbesaw Selassie, DrPH, Medical University of South Carolina, Personal Communication, November 2007).

As an example of how common TBIs are among prisoners, in

a recent study of TBI among federal prison inmates, a high percentage of women reported a history of TBI, especially multiple concussions, often totaling 10 or more, and these were usually associated with interpersonal violence (Pamela Diamond, PhD, University of Texas-Houston, Personal Communication, October 2007). One subject in this study estimated that she had been hit in the head and often knocked unconscious by her boyfriend nearly every weekend during a three year period prior to entering prison. According to the study interviewers, many of the women seemed to describe the experience of multiple concussions in a matter-of-fact way, as though they were an expected part of life.

TBI-related secondary conditions

Although a history of TBI is quite common among the offender population, not all TBIs result in long-term disability. The prevalence of long-term problems resulting from these injuries has not been established. However, traumatic brain injury among prisoners is of particular concern because it often results in cognitive, social, emotional, and behavioral problems, including aggressive behavior (NIH Consensus Conference, 1998), and secondary conditions such as substance abuse that can greatly affect their ability to function both while they are in prison and after they return to the community. (Coid, 2005; Merbitz et al., 1995) Knowledge that these problems are related to TBI as opposed to other etiologies would help inform the implementation of TBI-specific interventions, resulting in more effective management and rehabilitation and ensuring greater potential for successful community reintegration.

Individuals with a history of TBI are significantly more likely to have problems with alcohol or other substance abuse (SA) compared with persons without TBI (Silver et al., 2001). However, the relationship between TBI and substance abuse problems among prisoners has not been well-studied. The limited literature to date suggests that cognitive problems associated with a past history of traumatic brain injury (TBI) may affect inmates' potential to succeed in rehabilitation (Valliant, et al, 2003; Corrigan, 1995), including SA treatment (SAMHSA, 1998a).

TBI can result in irritability or aggressiveness, including explosive outbursts, which can be set off by minimal provocation or occur without warning (Silver et al, 2005). Among male prisoners, a history of TBI is strongly associated with perpetration of domestic violence (Cohen et al, 1999), and female prisoners who are convicted of a violent crime are more likely to have had a pre-crime TBI and/or some other form of physical abuse (Brewer-Smyth, 2004). In the prison setting, such aggression and other behavioral disturbances can lead to further injury for the prisoner or others (DOJ 2001; Maryland Police, 2001) and affect corrections center management (Schofield et al, 2006; Merbitz et al, 1995). Aggressive or violent behavior is also associated with recidivism (Coid, 2005). Thus, screening for TBI within the prison setting has been recommended to identify inmates with TBI-related behavior problems and help inform improved inmate safety and management (Schofield et al., 2006). Offenders exhibiting TBI-related aggression might also be taught behavioral and cognitive strategies to inhibit aggressive behaviors (Cohen et al., 1999), although to our knowledge this has not been demonstrated in a prison population.

Although few studies have investigated the topic, homelessness has been found to be associated with both imprisonment (Kushel et al., 2005) and with a history of head injury (Bremner et al., 2005), but the role of head injury (or TBI) as a risk factor has not been well described.

FIGURE 1 Rates of TBI in Prison Studies

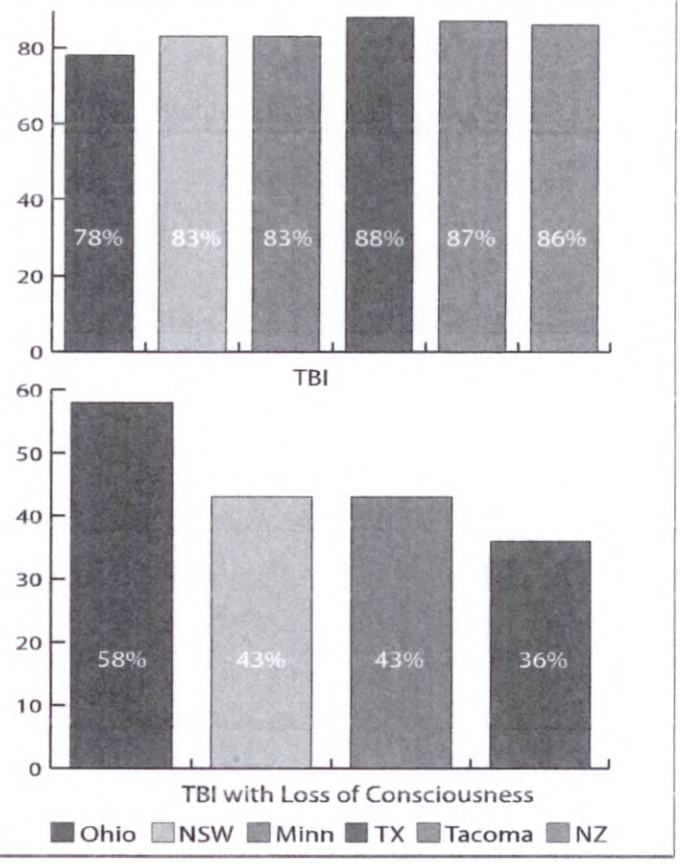
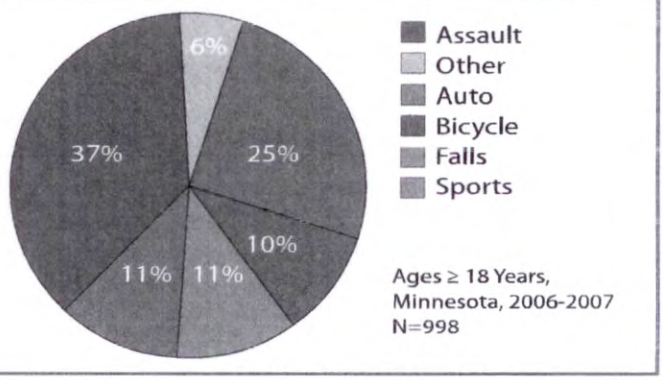


FIGURE 2 Causes of Traumatic Brain Injury Among Male Prisoners



Identifying a history of TBI

Screening for traumatic brain injury in prisons has been recommended as a means of informing more effective substance abuse treatment (SAMHSA, 1998b) and inmate management (Schofield et al, 2006; Kaufman, 2005) within corrections facilities.

Anecdotal reports suggest that although some prison intake interviews ask about a history of head injury or TBI, valid and reliable measures for TBI screening have not routinely been used in the prison setting (John Corrigan, PhD, Ohio State University, Personal Communication, July 2006). Results from the recent Minnesota project (see above) suggest that a routine

intake question asking if the inmate ever had a head injury was inadequate in identifying head injury. Of the 998 inmates interviewed in that project, only 10 (1 percent) reported a history of head injury during the intake screening, as compared with 826 (83%) who reported having had at least one according to results from the TBIQ, a more detailed screening questionnaire. Similarly, Diamond and colleagues (2007) reported that a one-item, self-administered screener used during admission to prison detected only 19% of the TBIs identified via structured interview. Thus, detailed screening is needed to more accurately identify inmates with a history of TBI.

Some important factors must be considered, however, before screening is begun. First, a good working relationship must be established with corrections officials who initially may have little understanding of the potential importance of TBI within their inmate populations. (Kaufman, 2005) However, their concern for the health and safety of both inmates and corrections officers may be a good starting point for initiating discussions about implementing screening for TBI. Dissemination of fact sheets produced by the CDC, including one specifically aimed at educating criminal justice professionals, could be helpful. (See Sidebar). Second, identification of inmates with TBI should lead to some beneficial action, and establishment of a plan to assist screened populations ideally should be established before screening begins. Some of the potential benefits of screening for TBI among prisoners are that it could lead to improved treatment or management that takes into account the cognitive problems that interfere with the potential of inmates with TBI to adhere to rehabilitation programs designed for persons without TBI. Programs that could benefit from knowledge of a history of TBI include substance abuse treatment, training for victims of violence in strategies to decrease risk, and for perpetrators to manage aggressive behavior, and work assignments, all of which should be tailored to account for TBI-related deficits. Strategies to help victims of violence decrease their risk of re-injury could be implemented. In the long-term, successful implementation of such strategies could lead to more successful reintegration of inmates into work or school, decreased risk of homelessness, and decreased risk of recidivism. Although much more research is needed to design and validate more effective rehabilitation programs for inmates with TBI, successful pilot projects could help inform the development of future, more effective interventions.

Once it's decided that a screening program should be implemented, selection of the appropriate screening instrument is important. Selection of a validated screening tool will help ensure that identification is as accurate as possible and help to avoid mislabeling someone as having had a TBI (false positive), or missing a history of TBI (false negative). Two screening tools have been developed specifically for use with incarcerated populations and validation of these measures is currently in progress. First, the Traumatic Brain Injury Questionnaire (TBIQ) (Diamond et al, 2007) is an interviewer-administered instrument with three sections: Section I consists of items asking whether the respondent has ever experienced a head injury from 12 situations associated with such injuries (e.g., vehicle crashes, falls, assaults). Section II probes for details of the head injuries reported in Section I. Questions include age at the time of the injury, whether there was any loss of consciousness or post-traumatic amnesia, and what care was received. Section III assesses the frequency and severity of 15 cognitive and physical symptoms commonly found with head injury (e.g., trouble concentrating or remembering, dizziness or headaches). Of note, inmates are asked about "head injuries" rather than "brain injuries" because the developers of the instrument found that inmates did not understand the term brain injury. The Ohio State University TBI Identification Method (OSU TBI-ID; Corrigan et al, 2007) consists of two steps: Step 1 asks participants to recall any injuries involving a blow to the head or neck or high velocity forces that could have shaken the head violently. Step 2 collects more detailed information about each injury, including whether consciousness was altered, medical attention was received, and if any TBI-related symptoms were experienced after the injury. For both measures, the length of time required to administer them depends on the number of injuries reported. However, the TBIQ takes an average of 15 minutes and the OSU TBI-ID takes about 5 minutes to administer. The OSU Method is also available in a short-form version.

Though useful for identifying offenders with a history of TBI, screening measures are not designed to determine whether specific deficits in function are present. Thus, additional testing may also be needed to identify the smaller sub-sample of inmates with TBI-related deficits who are in greatest need of attention or intervention. For this reason, the Minnesota project is conducting additional testing of inmates who screened positive for a history of TBI using the *Repeatable Battery for the Assessment of Neuropsychological Status* (*RBANS*). The *RBANS* is a brief screen for assessment of cognitive deficits that has been shown to be useful in evaluating cognitive problems associated with TBI (McKay et al, 2007). With further validation, it is hoped that the OSU method will also provide information that can be used to identify particular characteristics of a history of TBI (severity, age at injury, etc.) that will help identify the inmates who are most in need of intervention. Administration of more detailed neuropsychological batteries may also be needed and helpful if resources are available.

Example of a successful TBI identification pilot project: The Minnesota experience

The Minnesota TBI Interagency Leadership Council (ILC), a public private partnership of agencies, identified behavioral health and criminal justice as areas for development of state capacity with respect to TBI. Various members, especially the Brain Injury Association of Minnesota (BIA-MN), had been contacted by corrections staff seeking service resource information to assist with planning for individuals with TBI. BIA-MN contacted the Minnesota Department of Corrections (DOC) to pursue DOC's potential interest in TBI training and technical assistance. DOC was receptive and training was conducted for DOC staff and, importantly, the agency joined the TBI-ILC. The TBI-ILC then pursued grant funding for a TBI project in collaboration with the DOC.

As a result of these efforts, in 2006 Minnesota was awarded a State TBI Implementation Partnership Grant which is being conducted as an interagency effort entirely through the Minnesota DOC. The three year project, titled "TBI in MN Correctional Facilities: Strategies for Successful Return to Community," is administered by the federal Department of Health & Human Services, Maternal & Child Health Bureau, Health Resources & Services Administration (HRSA). The primary DOC goals

TBI AMONG PRISONERS

For more information about traumatic brain injury in prisoners, see the National Center for Injury Prevention and Control (CDC) website:

Traumatic Brain Injury:
A Guide for Criminal Justice Professionals
This guide provides an overview of TBI, information on the extent of TBI and related problems within the criminal justice system, and how these problem can be addressed
http://www.cdc.gov/ncipc/tbi/FactSheets/Prisoner_Crim_Justice_Prof.pdf

Traumatic Brain Injury in Prisons and Jails:
An Unrecognized Problem
This guide provides information for TBI professionals regarding what is known about individuals with TBI in prisons and jails, how TBI-related problems affect them and others while they are incarcerated, and what is needed to address these problems.
http://www.cdc.gov/ncipc/tbi/FactSheets/Prisoner_TBI_Prof.pdf

for this grant include enhancing facility and community safety through identification and effective interventions for offenders with TBI.

The project is currently in the second of three phases. A focus of the initial phase of the project was screening offenders for TBI utilizing the TBIQ. Approximately 1000 adult males, one hundred adult females and fifty juvenile males were screened. (Initial results of those screenings for males are reported in Figure 2). The current phase of the project involves identification of a range of "best practices" interventions that can be used with this population along the continuum of corrections systems and services (i.e., offender management, education, treatment). General information on TBI along with intervention strategies is being broadly disseminated within the DOC through education and training. Development of TBI release planning processes has also begun. In the final phase of the grant, implementation of the TBI identification and intervention strategies will continue along with efforts towards long-term project sustainability.

Conclusion:

TBI among incarcerated populations is an important public health problem. Increased collaboration between traumatic brain injury and criminal justice professionals has the potential to inform more effective management of offenders and increase their potential for successful reintegration into the community. Further research is needed to refine screening methods and develop effective interventions.

ABOUT THE AUTHORS

Ms. Wald is an epidemiologist with graduate degrees from the Rollins School of Public Health at Emory University and the University of Maryland at College Park. Prior to moving to the Centers for Disease Control and Prevention, she was the Research Program Director for the Department of Emergency Medicine at Emory University School of Medicine where she managed prospective clinical trials and public health studies, including several TBI projects, in three emergency departments including Atlanta's Level I Trauma Center, Grady Memorial Hospital.

Ms. Helgeson is the Project Director for the Minnesota State TBI Implementation Partnership Grant. Helgeson is a Mental Health Program Consultant for the Minnesota Department of Human Services (DHS), the lead state agency for State TBI Grants. She has worked with disability services and policy for DHS for almost 30 years and with brain injury services for over 20 years.

Dr. Langlois is the Guest Editor for this issue of the Brain Injury Professional. She is a Senior Epidemiologist with the National Center for Injury Prevention and Control, Centers for Disease Control and Prevention in Atlanta, GA.

REFERENCES

(Items with an asterisk '*" indicate data sources for Figure 1)

*Barnfield TV, Leathem JM. Neuropsychological outcomes of traumatic brain injury and substance abuse in a New Zealand prison population. *Brain Injury* 1998;12(11):951-62.

Bremner AJ, Duke PJ, Nelson HE, Pantelis C, Barnes TRE. Cognitive function and duration of rooflessness in entrants to a hostel for homeless men. *British Journal of Psychiatry* 1996;169(4):434-439.

Brewer Smyth K, Burgess AW, Shults J. Physical and sexual abuse, salivary cortical, and neurologic correlates of violent criminal behavior in female prison inmates. *Biological Psychiatry.* 2004;55:21-31.

Cohen RA, Rosenbaum A, Kane RL, et al. Neuropsychological correlates of domestic violence. *Violence and Victims.* 1999;14,397-411.

Coid J. Correctional populations: criminal careers and recidivism. Oldham JM, Skodol AE, Bender DS, Eds. *Textbook of Personality Disorders.* Washington, DC: American Psychiatric Publishing; 2005: 579-606.

Commission on Safety and Abuse in America's Prisons. Gibbons JJ , Katzenbach NB, co-chairs. Confronting confinement [online]. 2006 [cited 2006 June 8]. Available from: URL: http://www.prisoncommission.org

Corrigan, JD. Substance abuse as a mediating factor in outcome from traumatic brain injury. *Archives of Physical Medicine and Rehabilitation* 1995;76:302-309.

*Corrigan JD. Unpublished data. 2007.

*Diamond PM, Harzke AJ, Magaletta PR, Cummins AG, Frankowski R. Screening for traumatic brain injury in an offender sample: a first look at the reliability and validity of the Traumatic Brain Injury Questionnaire. *Journal of Head Trauma Rehabilitation.* 2007;22(6):330-38.

Kaufman CW. *Handbook for Correction Officers and Other Institutional Staff to Identify and Manage Inmates With Traumatic Brain Injuries.* Ann Arbor, MI: Dissertation Abstracts; 2005.

Kushel MB, Hahn JA, Evans JL, Bangsberg DR, Moss AR. Revolving doors: imprisonment among the homeless and marginally housed population. *American Journal of Public Health* 2005;95(10):1747-52.

Maryland Police and Correctional Training Commissions. Police interaction with individuals with brain injury: Student workbook [online]. 2001 [cited 2006 February 21]. Available from: URL: http://www.cbitac.nashia.org/tbics/download/mdpolice.pdf

McKay C, Casey JE, Wertheimer J, Fichtenberg NL. Reliability and validity of the RBANS in a traumatic brain injured sample. *Archives of Clinical Neuropsychology.* 2007;22:91-98.

Merbitz C, Jain S, Good GL, Jain A. Reported head injury and disciplinary rule infractions in prison. *Journal of Offender Rehabilitation.* 1995;22:11-19.

*Schofield, PS, Butler TG, Hollis SJ, Smith NE, Lee SJ, Kelso WM. Traumatic brain injury among Australian prisoners: rates, recurrence, and sequelae. *Brain Injury* 2006; 20:499-506.

Silver J, Kramer R, Greenwald S, Weissman M. The association between head injuries and psychiatric disorders: findings from the New Haven NIMH Epidemiologic Catchment Area Study. *Brain Injury.* 2001;11:935-945.

Silver JM, Yudofsky SC, Anderson KE. Aggressive disorders. Silver JM, McAllister TW,Yudofsky SC, Editors. *Textbook of Traumatic Brain Injury.* 2nd ed. Washington, D.C.: American Psychiatric Publishing, Inc.; 2005:259-277.

*Slaughter B, Fann JR, Ehde D. Traumatic brain injury in a county jail population: prevalence, neuropsychological functioning and psychiatric disorders. *Brain Injury* 2003;17:731-41.

U.S. Department of Health and Human Services . National Institutes of Health. NIH consensus statement: rehabilitation of persons with traumatic brain injury (October 26-28, 1998). Ragnarsson KT, editor. Washington (DC): Government Printing Office; 1999.

U.S. Department of Health and Human Services. Substance Abuse and Mental Health Services Administration (SAMHSA). Substance Use Disorder Treatment For People With Physical and Cognitive Disabilities: *Treatment Improvement Protocol (TIP) Series* 29; DHHS Publication No. (SMA) 98-3249; Rockville, MD; U.S. Department of Health and Human Services, 1998a. [cited 2006 July 6]. Available from: http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat5.chapter.52487

U.S. Dept. of Health and Human Services. Substance Abuse and Mental Health Services Administration. (SAMHSA). Put Prevention into Practice. *Treatment Improvement Protocol (TIP) Series* 44: DHHS Publication No. (SMA) 98-3249; Rockville, MD; U.S. Department of Health and Human Services, 1998b [cited 2006 August 3]. Available from: http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat5.chapter.80044

U.S. Dept. of Justice. Office of Justice Programs. Bureau of Justice Statistics. Medical Problems of Inmates, 1997. Maruschak LM, Beck AJ (Eds.) *Bureau of Justice Statistics Special Report.* No (NCJ) 181644. Washington, D.C.: U.S. Department of Justice, 2001 [cited 2006 August 3]. Available from: http://www.ojp.usdoj.gov/bjs/pub/pdf/mpi97.pdf

U.S. Dept. of Justice. Office of Justice Programs. Bureau of Justice Statistics. Prison and Jail Inmates at Midyear 2005. Harrison PM, Beck AJ (Eds.) *Bureau of Justice Statistics Special Report.* No. (NCJ) 213133. Washington, D.C.; U.S. Department of Justice, 2006 [cited 2006 August 3]. Available from: http://www.ojp.usdoj.gov/bjs/pub/pdf/pjim05.pdf

Valliant PM, Freeston A, Pottier D, Kosmyna r. Personality and executive functioning as risk factors in recidivist. *Psychological Reports.* 2003;92:299-306.