Rethinking Brain Injury: Research, Accommodations and Access

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Handouts from PowerPoints

Slide 1
Rethinking Brain Injury: Research, Accommodations and Access
“Traumatic Brain Injury: A disease process, not an event.”
from M.B. DeWitt, Aug 2010, Journal of Neurotrauma

Slide 2
History of Neuroscience
Study of the brain
Research in brain trauma is directly proportional to the number of injuries seen during a large scale conflict
Thousands of years old
Trepanning
Modern neuroscience
Civil War – Mental institutions
WWI – “Shell Shock”
WWII- Vocational programs

Slide 3
History of Head Injury
Korean War- MASH units
MVA’s increase – Faster cars, more roads
Vietnam – Rehabilitation Act
Israeli Conflicts – Early intervention
Persian Gulf – Screening tool for mTBI
WOT (OEF/ OIF) – TBI is “signature wound”

Slide 4
US Non-Military Statistics
NIH
Pie chart with % of TBI by injury event
- 50% Motor Vehicle Accident
- 21% Falls
- 12% Assaults
- 10% Recreational activities

Slide 5
TBI
#1 cause of death in children and young adults
5.3 million Americans are disabled due to TBI
Almost 50% of individuals with TBI were intoxicated at time of injury (excluding soldiers)
Most TBI occur at night on the weekends
1 person every 21 seconds experiences a TBI

Slide 6
Demographics
1.7 million individuals sustain a TBI yearly
Over 1.3 million are seen in the ER
30.5% of all injury-related deaths in US
Direct, indirect, loss of productivity costs are about $60 billion annually
$4 million dollars in health/ lost wages per individual with TBI

Slide 7
Individual Characteristics
Greatest number of incidence of TBI by age
4 years and under
males with highest incident of ER visits

15-25 years of age
Over 65 years old

Risk Factors
Substance abuse
Psychiatric diagnosis
  symptoms of impulsive behavior

Slide 8
War on Terror (WOT)
Barotrauma is defined
  60% of blast injuries result in TBI
Risk of injury / disability increases with every tour
Ratio of injuries to deaths (16:1)

Slide 9
Definitions
Chart with Head injury at the top
Connected to traumatic brain injury with lines connected to open and closed

Slide 10
Other Terms
Barotrauma
Coup Contra coup
DAI (Diffuse axonal injury)
LOC (loss of consciousness)
Glasgow Coma Scale
mTBI (mild traumatic brain injury)
Polytrauma
PCS (post-concussive syndrome)
Post-traumatic amnesia
Secondary impact syndrome
Shaken baby syndrome
Slide 11
Barotrauma
IED (Improvised Explosive Device) http://www.youtube.com/watch?v=gTuVem1SPIE&feature=related
From hyper- and hypobaric environments
Pressure waves on body organs without direct contact
Slide 12
Coup Contra Coup Injury
Back and forth or rotational movement of the brain within the skull
Doesn’t necessarily come from a direct head injury
Whiplash
Barotrauma
Sports injury
Shaken baby syndrome
Slide 13
Picture demonstrating coup contra coup injury
http://www.dod.state.ga.us/armyguard/armyimages/brain.jpg
Slide 14
DAI
Diffuse axonal injury
Cell damage specially axon damage that is not readily visible by medical tests
Axons are neural cells that transmit messages within the brain
Damage can create any number of symptoms and contribute to post concussive syndrome, and secondary injury syndrome and death
Slide 15
Glasgow Coma Scale
Medical scale used to evaluate degree of consciousness
Measures visual response, verbal ability, and motor skills

Will see number from 3 – 15

Neurological reports can refer to the initial GCS in the history


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LOC

Loss of Consciousness

Self reporting is not reliable

LOC below 30 minutes is mTBI; over 30 minutes is TBI

Part of the Glasgow Coma Scale

Not aware of surroundings, not easily awakened

Passing out

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mTBI

Mild Traumatic Brain Injury

Closed head injury

Blast related trauma

The injury not the resulting symptoms

No clinically observed signs or 30 minutes LOC

Maybe used interchangeably with concussion (grade 1 to 3)

Invisible disability

Slide 18

Polytrauma

Common term among military medical personnel

More than one severe, life-threatening injury

Injuries may interfere with treatment of TBI

Slide 19
PCS
Post concussive syndrome
Following a mTBI (concussion)

MVA
No clinically observed signs or 30 minutes LOC
Symptoms can be difficult to distinguish from PTSD
DSM-IV TR diagnosis (symptoms lasting 3 months)
Majority of the head injury in US

Slide 20
PCS Symptoms
Physical
Headache, sleep disturbances, dizziness, nausea, fatigue, photo /phonophobia
Cognitive
Impaired attention, difficulty concentrating, memory problems
Affective
- Anxiety, depression, emotional lability

Slide 21
Post Traumatic Amnesia
Memory loss due to injury
Periods of confusion
Research showing a directly link with prognosis
Anterograde
After the injury
Retrograde
Before the injury

Slide 22
Secondary Impact Syndrome
Experiencing another mTBI before the brain has recovered fully
Seen in athletes especially high school

Those with psychiatric diagnosis engage in high risk activity tend to have repetitive head injuries

Can cause severe brain swelling and cell death

Slide 23

Neuropsychological Testing

Evaluates:

Perceptual/Sensory
Motor Functions
Intelligence Cognitive Abilities
Academic Achievement
Personality/ Behavior
Educational / Classroom

Slide 24

Selection of Assessments

Neuropsychological Testing
Halston Reittan Battery
Luria Nebraska Battery
WISC/ WAIS
Woodcock Johnson and Dean-Woodcock
Wechsler Memory Scale
MMPI
Bender Visual Motor Gestalt

Slide 25

Reading Reports

Looking for

Significant differences from the norm

Slow processing
Short term memory issues
Visual /auditory processing problems
Impulsivity
Executive functioning
Abstract thinking
Slide 26
Brain picture colored and labeled with parts
Slide 27
Brain Functioning
Brain stem – midbrain, pons, medulla; most life threatening injury
Cerebellum- physical abilities
Limbic system- thalamus, hypothalamus, amygdala, hippocampus
http://www.neuroskills.com/brain.shtml
Slide 28
Cerebrum or Cortex
Frontal lobe – reasoning, problem solving, judgment, impulse control; also motor control and memory
Parietal – skin sensation, movement, orientation in space, speech
Temporal – auditory discrimination, language recognition, emotion, memory, speech
Occipital- visual processing
Broca’s area- speech, language recognition and facial nerves
Corpus callosum – translates information between two hemispheres of the brain
Slide 29
PET
Images of the brain Postitron emissions tomography
Googleimage.living with alzheimers_yourbrain
Slide 30
Impact on Learning
Attention and Concentration

- Restlessness
- Easily distracted
- Difficulty initiating tasks / finishing tasks
- Problem following conversations/ verbal directions

Impact on Learning

Communication

- Word finding
- Initiating conversation
- Rambling thoughts, flight of ideas
- Disorganized
- Flat affect
- Inability to read social cues

Planning / Organizing

- Missing information in class
- Remembering appointments
- Steps to complete projects papers

Processing Information

- Slower fluency, processing, reaction time
- Needs information repeated often
- Problem solving
- Easily fatigued

Impact on Learning

Memory
Retention
Recall
Amnesia which creates fear
Tends to “fill in the gap” when short term memory fails
Unreliable historian

Slide 34
Impact on Learning
Reasoning / Problem solving
  Recognition of problems
  Flexibility of thought
  Analyzing information
  OCD tendency
Impulsivity
  self awareness
  self control
  social cues
  inappropriate behavior

Slide 35
Impact on Learning
Physical
  Epilepsy
  Balance, mobility, strength
  Endurance
  Fine motor movement
  Pain / spasticity
  Vision
  Hearing
  Speech
Emotions

Slide 36

Impact on Learning

Psychological

  Co-existing conditions
  Pre-morbid conditions
  ADHD
  OCD
  PTSD
  Depression
  Anxiety
  Sleep disorders
  Personality disorders
  Suicide ideation
  Violence/ Aggression

Slide 37

Accommodations for Learning

Case Study

  History of ADHD and head trauma from football, undiagnosed PCS
    Slow processing
    Difficulty following verbal directions
    Reading difficulty
    Easily distracted
    Organization / planning problems

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Accommodations for Learning

Case Study

  History of high blood pressure, Sickle Cell, stroke post 12 years.
Ambulatory but mobility slow with paraesthesia on left side
Short term memory problems
Executive functioning issues
Visual spatial concerns
Flat affect

Slide 39
Accommodations for Learning
Case Study
Veteran of WOT with two tours of duty, official diagnosis is amputation below the knee (BTK) of right leg due to IED
Decreased concentration
Depressed affect
Slow speech
Difficulty reading

Slide 40
TBI Retention Issues
Ready to return to educational setting
Course load
Support services
Faculty/support services not familiar with sequela of TBI
Lacks advocacy skills
Lack of role models
Career choice usually pre injury
Need to repeat courses due to slow processing
Memory loss may interfere with life skills
Impulsive behavior

Slide 41
Athletes
Temporary disabling condition
PCS
Short term accommodations to support educational goals
Pre and Post injury testing
ImPACT
Support services
Institutional
State
Slide 42
National Support
Brain Injury Association of America http://www.biausa.org/
National Resource Center for TBI http://www.neuro.pmr.vcu.edu/
Center for Disease Control and Prevention http://www.cdc.gov/traumaticbraininjury/
DS00552
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State Support
Brainline.org
Brain injury association of Pennsylvania sponsors Brain Steps – school reentry program for K-12
State Affiliates

**BIA of Washington**
401 Broadway, 4th Floor Seattle, WA 98122
**Info Line:** 877-824-1766  **Toll-Free:** 877-982-4292  **Phone:** 206-897-5755
**E-mail:** info@braininjurywa.org  **Website:** http://www.braininjurywa.org

**BIA of Pennsylvania, Inc.**
950 Walnut Bottom Road, Suite 15-229 Carlisle, PA 17015
**Info Line:** 800-444-6443  **Toll-Free:** 866-635-7097  **Phone:** 717-692-5569
Current Research

No real advancement in 30 years due to
Decreased funding from federal agencies
No real interest from industry
Continued disappointing results
Medics on front lines had little/no experience handling major trauma injuries/TBI
No rehabilitation programs for vets with TBI

Currently
OD Initiative to Help Iraq/Afghanistan War Efforts
NFL interest in testimony from former athletes
505 studies currently

Focus of Current Research
Prevention
Minimizing secondary injury damage
Regeneration

http://www.traumaticbraininjury.com/content/videolibrary/state/penn.html

History of TBI and Prognosis
Linked to
Reduced life expectancy
Chronic sleep disorders
Neurodegenerative disorders
Neuroendocrine disorders
Neurobehavioral disorders
A blow to the brain. Discusses head injury in the NFL. This is a 60 minutes program.

http://www.youtube.com/watch?v=OQMLI66r0NM
http://www.youtube.com/watch?v=fY7J7bCcNoU&feature=related

Disclaimer: There may be some alteration or addition to the presentation between the time the handouts are posted and the presentation. Thank you for your patience.

Other Resources

Websites
http://www.biausa.org/
Brain Injury Association of America

Combat 2 College

Department of Defense TBI and PTSD Quick Facts

http://www.washington.edu/doit/Brochures/Programs/equal_access_spaces.html
Equal Access: Universal Design of Physical Spaces

http://www.halfofus.com/veterans/
Half of Us: Veterans (self-help site)

www.heath.gwu.edu
Health Resource Center at George Washington University, National Clearinghouse on Postsecondary Education for Individuals with Disabilities

http://www.military.com/education/
Military.Com Education Center

http://www.rand.org/multi/military/veterans/
RAND Health and the RAND National Security Research Division

http://www.studentveterans.org/
Student Veterans Organization

http://www.ptsd.va.gov/
US Dept of Veteran Affairs, National Center for PTSD

http://www.washington.edu/doit/Veterans/
The Veterans Center at Do-It

http://www.woundedwarriorproject.org/
Wounded Warriors Project

National Resource Center for TBI http://www.neuro.pmr.vcu.edu/
Center for Disease Control and Prevention http://www.cdc.gov/traumaticbraininjury/
DS00552
National Dissemination Center for Children with Disabilities http://nichcy.org/disability/specific/tbi
Defense and Veterans Brain Injury Center http://www.dvbic.org/
Traumatic Brain Injury.com http://www/traumaticbraininjury.com/content/understandingtbi

YouTube videos

http://www.youtube.com/watch?v=j_OJQbaUL_U
Scene from the Hurt Locker

http://www.youtube.com/watch?v=gTuVem1SPIE&feature=related

References


Columbine.


