Planning, Preparing, and Executing the Winning TBI Cases and Direct Examination of Plaintiff's Treating Physicians in TBI

TBI FACTS
- 5.3 million Americans (just over 2% of the population) currently live with a disability resulting from a TBI
- 1.5 million people sustain an TBI each year
- 50,000 die due to TBI each year
- Every 21 seconds a person in the US sustains an TBI
- 235,000 are hospitalized
- 1.1 million are treated and released from an emergency department

Acquired Brain Injury
An injury to the brain, occurring after birth...not hereditary, congenital, degenerative, or induced by birth trauma. Commonly results in a change in neuronal activity, which affects the physical integrity, the metabolic activity, or the functional ability.

Prepare Your Case From Day 1: The Paradox of Minor Trauma Causing Major Injuries
Obtain all medical records (consider PET/SPECT)
Deal with pre-existing- provide Hx to treaters
Hospital records are your best friend (look for increase in glucose levels- anoxic brain injury, pneumothorax) Look at discharge summary- says your have had a TBI- may get worse over time and client may not have immediate symptoms
Normal MRI- GCS- can be dead or in a coma and have a normal MRI- MRI does not show function
Need to consider need for Guardian
Experts- NP, VOC Rehab, Econ, LCP, Acc Recon, Neurologist, physiatrist
B & A Witnesses – the importance of credibility- pin point each of client’s problems
  – Family members
  – Friends/neighbors
  – Church/Synagogue/Moonies
  – Employment
    » Personnel file
    » Absenteeism
    » Performance Reviews

Levels of Injury
Injuries can range from very mild to very severe, and depending on the location of the brain injury, impairments may include...

Impairments May Include
- Lack of coordination
- Slowness or confusion in the planning and sequencing of movements
• Muscle spasticity
• Speech disorders
• Seizures, paralysis
• Chronic, persistent pain (nerve damage, fractures)
• Sensory impairments (e.g., vision and hearing loss)
• PanHypopituitarism
• Diabetes Insipidus

CME Report Is A Goldmine
• Read It
• If don’t understand it- your expert can decipher
• Gather prior CME reports
• If records review only what records provided?
• If exam done- film it
• Your expert needs to read CME report/depositions

Make Sure You Have Provided your experts with Everything
• All medical records
• Work records
• School records
• Disability records
• Depositions
• CME Reports
• Support your expert opinions with others- Ph.D., radiology, neurology
• Importance of demonstrative aids
• Don’t disclose your expert until you have hired them
• Treaters Make the BEST Experts

Behavioral, Social and Emotional Impairments
• Mood swings
• Depression, blunted affect
• Lack of motivation, decreased initiative
• Agitation
• Impulse control
• Interpersonal difficulties, impaired empathy

Cognitive Impairments
• Short and/or long term memory loss
• Poor attention, judgment, and concentration
• Communication disorders related to speech, writing, and reading

Know your Anatomy & Physiology
  – The Brain’s Functions
  – Types of Brian Injuries
  – Closed head injury
• occurs when an outside force impacts the head hard enough to cause the brain to move within the skull
  – Open head injury
    • can occur from motor vehicle crashes, gun shot wounds, falls, shaking (a baby), sports, and physical violence, such as hitting or striking with an object

**Causes of Brain Injury**
  – Airway Obstruction
  – Near-drowning, throat swelling, choking, strangulation, crush injuries to the chest
  – Electrical shock or lightning strike
  – Trauma to the head and/or neck
  – Traumatic brain injury with or without skull fracture, blood loss from open wounds, artery impingement from forceful impact, shock
  – Vascular Disruption

**Brain Injury is Unpredictable**
  – A person with a brain injury is a person first
  – No two brain injuries are exactly the same
  – The effects are complex and vary greatly from person to person
  – The effects may depend on such factors as cause, location, and severity, past medical Hx

**Testing for TBI**

**Need for Neuropsychologist**
1. MTBI, more than any other clinical entity, is a neuropsychological construct
2. The contribution by neuropsychologists to MTBI research is unmatched by any other discipline
3. Neuropsychologists are uniquely suited to evaluate and treat MTBI
4. Neuropsychologists should not limit their role in MTBI just to neuropsych testing-coping

**EEG/EMG/ENG**

Electroencephalography EEG monitors brain activity through the skull. Used to Dx seizure disorders, brain damage, inflammation, metabolic disorders.

Electromyography EMG Dx nerve and muscle dysfunction and spinal cord disease. Records electrical activity of the brain and spinal cord to a peripheral nerve root that controls muscles during contractions and at rest.

Electronystagmography ENG describes a group of tests used the DX involuntary eye movement, dizziness, balance disorders and evaluate some brain functions.
Neuroimaging
- Skull Radiography
- CT Scan (Gold Standard?)
- Magnetic Resonance Imaging (MRI)
- Functional MRI (fMRI)
- PET Scanning
- SPECT Scanning
  Magnetoencephalography (MEG)
  Diffusion Tensor Imaging (DTI)

Conventional MRI
MRI- T1 (anatomical): fast to acquire, excellent structural detail (e.g. white and grey matter). T2 (pathological): slower to acquire, therefore usually lower resolution than T1. Excellent for finding lesions.
Functional MRI-Uses the blood’s magnetic properties to produce real time images of blood flow in particular areas of the brain.

Positron Emission Tomography (PET)
provides 2-3 dimensional pictures of brain activity by measuring radioactive isotopes that are injected into the blood stream – good for Dx tumors, diseased tissue, measure cellular or tissue metabolism, shows blood flow—provides greater understanding of specific areas of brain activity involved in certain problems.

CT Signs of TBI
- Hematoma: pooled blood
- Contusion: swelling, bruising.
- EDH: epidural hematoma
- DAI: diffuse axonal injury
- SDH: subdural hematoma,
- SAH/IVH: subarachnoid and intraventricular hemorrhage.

CT Perfusion
CT can be enhanced with a contrast agent.
For example, Gadolinium (Gd) injected into the blood stream.
Gd is radio-opaque.
Can show areas of reduced, delayed or slowed flow.
Acute mismatch of perfusion and injury shows tissue that can be salvaged.

Magnetoencephalography (MEG) and Diffusion Tensor Imaging (DTI) for Differential Diagnosis in Mild TBI and PTSD
The lack of positive findings in mild TBI (mTBI) and PTSD using conventional neuroimaging techniques.
New neuroimaging techniques: magnetoencephalography (MEG) and diffusion tensor imaging (DTI)
MEG and DTI for mTBI
MEG for PTSD
Differential diagnosis of mTBI and PTSD
Naval & Marine Corp combat & operational stress conference 2010

MEG/DTI

- PTSD and Traumatic brain injury are leading cause of sustained physical, neurological, cognitive, and behavioral deficits in military personnel and civilian population.
- Differential diagnosis of mild TBI and PTSD is crucial since they require different treatments, but can be challenging due to symptom-overlap.
- Conventional CT and MRI focus on blood products with limited sensitivity for diagnosing mTBI and PTSD: Among civilian mTBI patients with GCS of 13, 14, and 15, only 28%, 16%, and 4% showed visible intracranial lesions with conventional CT or MRI, respectively. Conventional MRI and CT do not detect abnormality in PTSD either.
- More sensitive neuroimaging techniques, such as MEG and DTI are needed to detect subtle neuronal injuries due to mTBI and PTSD.

SPECT SCAN

SPECT (Single Photon Emission Computed Tomography) is brain imaging for patients and physicians. Unlike an MRI or a CT scan, which provides information about structural (anatomical) abnormalities in the brain, a SPECT scan provides information about how your brain is working. This is a very important distinction.

Are neurons dying? What is happening to the brain tissue? What can specialized imaging techniques tell us?

Magnetic resonance spectroscopy is a very old technique. It's actually the first type of technique that was used in MR imaging. It's not in itself an imaging technique so you don't get a picture. You're not seeing an image of the brain. Instead what you get is a measure of biochemistry of the tissue that's in the brain. So we can look at whether neurons are dying or whether axons have been damaged, whether there's inflammation.

MR spectroscopy is only useful in certain areas of the brain but beyond magnetic resonance imaging there are new techniques in what we consider the imaging world including optical coherence tomography.

This is a relatively new technique - allows us to look at blood flow, both relatively close to the edge of the brain and looks at both blood that's been oxygenated and also deoxygenated blood. As neurons fire they take up blood, they use the oxygen so you get this rush of both oxygenated and deoxygenated blood. The advantage of this is we get a really fast time course of looking at how the brain functions. The downside is it only goes about 2 inches into the cortex so it limits what we can do.
**Diffuse Axonal Injury: The Pathobiology of TBI**

DAI can be a predictor of outcome as it evolves over hours and days and is characterized by axonal swelling and severing of the axons—it can also evolve as a consequence of focal changes in the plasma-lemma, including altered permeability which impede axonal transport.

Unmyelinated small caliber axons may be particularly vulnerable to TBI.

DAI Axon is twisted or severed. Communication between neurons is inhibited.

**Daubert Distilled**

Trial judges must assess the relevance of the proffered evidence. They must determine the scientific validity underlying the evidence’s methodology.

Functional neuroimaging evidence requires an expert to interpret a scan for the jury and to testify as to the results of the scan. The expert testimony must be based on sufficient facts or data and it must be the product of reliable principles and methods and the testimony must be reliably applied to the facts of the case.

**Use of Demonstrative Aids**

**Mod/Severe TBI: Intracerebral Hemorrhage**

- Intraparenchymal Hemorrhage
- Subarachnoid Hemorrhage
- Disruption of subarachnoid vessels
- Common in moderate to severe brain injury
- Worse prognosis
- Twice as likely as other head injured patients to suffer from death, persistent vegetative state or severe disability

**Clinical Features of Mod/Severe TBI**

Neurologic Exam
- Pupillary Size + Reactivity
- Fixed Dilated Pupil = Ipsilateral Intracranial Hematoma resulting in uncal herniation
- Bilateral Fixed + Dilated = Poor Brain Perfusion, bilateral uncal herniation or severe hypoxia
- Indicative of very poor neurological outcome

Neurological Posturing
- Decorticate Posturing = Upper extremity flexion with lower extremity extension
- Cortical Injury above the midbrain
- Decerebrate Posturing = Arm extension and internal rotation with wrist flexion
- Indicative of brainstem injury
Very Poor predictor of outcome

**Operative Management**
- Decompressive Craniotomy
  - Salvage operation used to manage increasing ICP
  - Removal of part of skull and underlying dura
  - Decreases ICP, improves cerebral perfusion, prevents ischemia
  - Serves to limit secondary insults
- Literature divided on true benefit

**Signs of TBI**
- Headaches or neck pain that doesn’t go away
- Difficulty remembering, concentrating, or making decisions
- Slowness in thinking, speaking, acting, or reading
- Getting lost or easily confused
- Feeling tired all of the time, having no energy or motivation
- Mood changes (feeling sad or angry for no reason)
- Changes in sleep patterns (sleeping a lot more or having a hard time sleeping)
- Light-headedness, dizziness, or loss of balance
- Urge to vomit (nausea)
- Increased sensitivity to light, noises or distractions
- Blurred vision or eyes that tire easily
- Loss of sense of smell or taste
- Ringing in the ears

**TBI Complications**
- Brain injuries can cause hypopituitarism-- but the management of TBI patients does not routinely include neuroendocrine evaluations.
- In TBI patients, some degree of hypopituitarism was shown in 35%. Total, multiple and isolated deficits were present in 4, 6 and 25%, respectively. Diabetes insipidus was present in 4%. Secondary adrenal, thyroid and gonadal deficit was present in 8, 5 and 17%, respectively. Severe GH deficiency (GHD) was the most frequent pituitary defect (25%). Diabetes insipidus was present in 7.5%. Secondary adrenal, thyroid and gonadal deficit was present in 2.5, 7.5 and 12.5%, respectively. Severe GHD was the most frequent defect (25%).
- **Conclusion:** TBI can be associated with high risk of acquired hypopituitarism. The pituitary defect is often multiple and severe GHD is the most frequent defect. Thus neuroendocrine evaluations should be considered in patients after brain injuries.

Physiological and Structural Evidence for Hippocampal Involvement in Persistent Seizure Susceptibility after Traumatic Brain Injury

Epilepsy is a common outcome of traumatic brain injury (TBI).
Limitations

- Lack of witness account of injury
- Immediate accessibility to injured patients
- Neuropsychological testing impractical in ER
- Lack of objective measures under constraints
- Lack of premorbid baseline measures
- Multitude of non-injury factors: alcohol/drugs, other injuries, litigation, others

Treating Physicians Are Your Friend

- Physical Medicine and Rehabilitation
- Physical Therapist
- Occupational Therapist
- Speech/language pathologist
- Vocational Rehabilitation Specialist
- Radiologist
- Neuropsychologist (grief counselor)
- Psychiatrist
- Neurologist

Depression and TBI

Depression is one possible result of TBI.
Recognition of depression can be confounded by an overlap of the symptoms that result from TBI.
Depression reduces quality of life and impairs ability to function in social and work roles.
In patients requiring physical therapy, depression can undermine rehabilitation planning and treatment adherence.

Using the Evidence to Prove and Disprove TBI

- Testimony of Treaters
- Lay witness Testimony
- Expert Testimony
  - Prepare for the Defense expert cherry pickers
  - CME- Watch Out for Hired Guns
- Conspiring Misleading Evidence
- Typical CME B.S.
  - Most people should be healed by now-- really calling my client a liar
  - Patient is exaggerating
  - No LOC
  - Normal CT
  - Normal CGS
  - No immediate symptoms
  - Most people recover from TBI
    - B.S. 3 % of articles say this- 97 % of articles do not say this
    - Expert is relying on defense expert articles
The Fallacy of Negative Findings

The Fallacy of Negative Findings: Insurance companies continue to defend brain injury cases as they did 20 years ago:
- Someone must be rendered unconscious to suffer a traumatic brain injury
- A person with a normal CT or MRI cannot have a brain injury
- There is no mechanism by which brain injury can occur in the context of a mild traumatic brain injury

Loss of Consciousness: Defense Fallacy

When Plaintiff is claiming TBI and the medical records indicate that there was no loss of consciousness during or immediately after the accident, that fact is treated as the most important factor by the defense doctors.

- Malingering
  More Defense B.S.
- Malingering is an INTENTIONAL exaggeration
- Invalid MMPI is not intentionality
- Make sure CME is using most updated test
- Get the raw data
- Tape CME

Prior Conditions Exacerbating TBI

- Diabetes
- Depression (poorer coping skills)
- Small vessel disease
- Pulmonary conditions
- Anxiety
- Prior TBI- less cognitive reserve
- It’s The Medication Making Your Client Loony
- Medication does not lead to addition
- Ask if they are recommending taking away the RX which is the only thing alleviating my client’s suffering?
- Would you be willing to sign a release saying my client can drive a car or would that be dangerous?
- Know the IME doctor’s duties to the patient

Rehabilitation: Team of Specialists

- Speech-Language Pathologist - specializes in production of verbal communication.
- Neuropsychologist - determines to what degree and how the brain is involved in difficulties.
- Occupational Therapist - specializes in structuring day to day tasks.
- Physical Therapists - specializes in physical functions, balance and movement.

Rehabilitation Strategies

- Compensatory
  - Written instructions, date books, calendars, pagers, electronic or other assistive devices
• Restoration
  – visual & auditory exercises, practice/performance, reinforcement, monitoring, problem-solving strategies, goal setting
  – The armed forces are currently doing a magnificent job studying mild TBI, blast injuries and utilizing the latest tools such as DTI (diffuse tensor imaging) to identify and rehabilitate traumatic brain injuries.

**High Risk Behaviors Associated with TBI**
  – Smoking
  – Alcohol misuse
  – Promiscuity
  – Dietary problems or habits
  – Drug Use; self medication
  – Lack of exercise, prolonged inactivity
  – Sedentary lifestyle
  – Obesity
  – Medications that may be debilitating over time
  – Indifference, lack of initiation
  – Negative moods

**Health and Adjustment**
  – Normal life expectancy ??
  – People with TBI generally have a greater propensity towards poor health habits as well as having poor health profiles
  – At risk for secondary complications
    • including social (e.g., poverty, arrests)
    • Family Law Issues

**What Makes TBI Worse?**
  – Extreme pain- brain releases chemicals
  – Fear- worse outcome of TBI
  – Age- older and younger thinner bridging of the veins
  – Older population is likely taking RX (blood thinners)
  – Multiple side effects of prescription medicine when they are all combined. Ask “can my client babysit your daughter on these drugs?”

**Chronic Nature of TB**: TBI is associated with increased incidences of:
  • seizures
  • sleep disorders
  • neurodegenerative diseases
  • neuroendocrine dysregulation
  • psychiatric diseases
  • non-neurological disorders
  • sexual dysfunction
  • bladder and bowel incontinence
  • systemic metabolic dysregulation that
• Important to obtain scans to demonstrate progressive nature of brain atrophy at sulci
• Brain tissue does not regenerate

**What Not To Say To A Brain Injured**
• You seem fine to me
• Maybe you're just not trying hard enough
• Your so grumpy
• How many times do I have to tell you the same thing?
• Do you have any idea how much I do for you?
• Your problem is all of the medication you're taking
• Let me do that for you
• Try to think positively
• Your lucky to be alive

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