New Developments in Concussion and Mild Traumatic Brain Injuries

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by Douglas E. Schmidt, J.D.
Schmidt Law Firm

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- *The William Mitchell Law Review*

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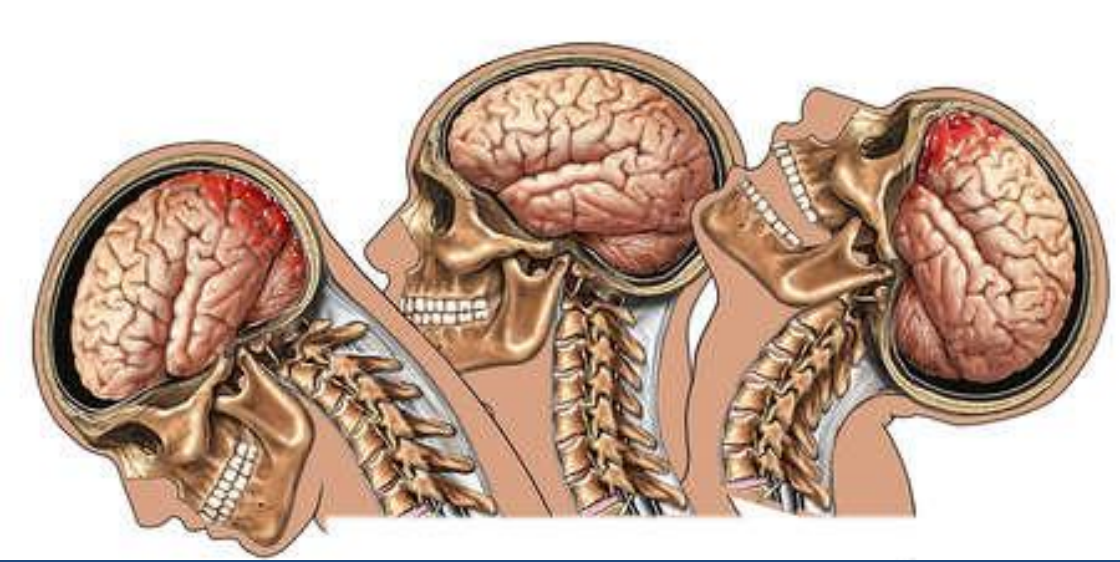
MODERN MEDICINE IS STILL IN THE DARK AGES REGARDING MILD TRAUMATIC BRAIN INJURY!!!

For decades, we have neglected the consequences of Traumatic Brain Injury. Only recently, have we awakened to Chronic Traumatic Encephalopathy (CTE) in professional football players.

We remain in the Dark Ages in **every other aspect** of Traumatic Brain Injuries outside of Professional Football.

60% of the victims of TBI in motor vehicle collisions are being grossly overlooked!!!

NEW DEVELOPMENTS IN CONCUSSIONS AND MILD TRAUMATIC BRAIN INJURIES



America has recently awakened to the fact that concussion injuries are a big problem. MTBIs can lead to significant life-long impairment affecting a person's abilitiy to function physically, cognitively and psychologically. (Heads Up-Facts about Concussion Injuries for Physicians.)

(The terms "mild traumatic brain injury" (MTBI) and "concussion" are synonymous.)

CONSCUSSIONS/MTBIs ARE A MAJOR HEALTH PROBLEM

The CDC Report to Congress on Traumatic Brain Injury, (2003) declared that:

-**MILD TBIs are not a minor problem**, instead, a major health problem affecting 1.5 million.

-75% of victims of TBI are MTBI.

-Also, "Clinical research has provided evidence that MTBI injuries can cause serious, long-lasting problems."

MTBIs CAN CAUSE SERIOUS AND PERMANENT DISABILITY.

The American Congress of Rehab. Medicine declared,

"Patients with MTBI can exhibit persistent emotional, cognitive, behavioral and physical symptoms, alone or in combination, which may produce a functional disability."

Studies show that 23% of MTBI victims do not recover within 1 year. (Cassidy)

Serious consequences can even develop anew after many months or years. (CTE, Seizures, Dementia, Movement disorders, etc.)

MEDICAL DOCTORS OVERLOOK MORE THAN HALF OF CONCUSSION INJURIES.

60% of the Concussions and MTBIs suffered in car accidents go undiagnosed and untreated.

The personal injury attorneys at the Schmidt Law Firm are specially trained to perform a careful, probing history and screening for mtBIs. That experience has revealed that 60% of the victims of a moderate to severe motor vehicle crash have clear evidence of a TBI.

Only about 20% of that group have been diagnosed with the mTBI.

EMERGENCY DOCTORS ADMIT THEY CANNOT RELIABLY DIAGNOSE MTBIs.

A peer-reviewed article published in the Journal of Academic Emergency Medicine recently stated,

"Currently, there is no validated clinically available method to reliably predict at the time of injury who will subsequently develop PCS."

"These patients more commonly appear normal on the acute clinical presentation."

The authors note that 38% of patients who later develop PCS are discharged without any recommendations for follow-up care. Yet, up to 80% of mild TBI patients will suffer persistent neuropsychological symptoms.

The authors propose a method of determining the existence or non-existence of MTBI at 3 weeks post injury. Visuomotor and proprioceptive performance was considered important.

Source: Subbian et al, A Novel Tool for Evaluation of Mild Traumatic Brain Injury Patients in the Emergency Department, Journal of Academic Emergency Medicine, April 2016, Vol 23, No 4, pp.382-392.

TWO IMPORTANT POINTS FROM THE EMERGENCY DOCTORS' ARTICLE.

The Academy of Emergency Medicine article is very signicant in two respects:

1. They admit that ER and UC Doctors cannot reliable diagnose Concussion/TBI injuries;

2. They acknowledge that concussion injuries "will later develop" (progressively) and cannot be reliably predicted as to which patients will develop PCS.

Source: Subbian et al, A Novel Tool for Evaluation of Mild Traumatic Brain Injury Patients in the Emergency Department, Journal of Academic Emergency Medicine, April 2016, Vol 23, No 4, pp.382-392.

MANY REASONS WHY TBIs ARE MISSED BY MEDICAL DOCTORS.

Emergency Doctors and Urgent Care Doctors Simply Miss 80% of the MTBIs from car accidents for several reasons:

1. The signs and symptoms are often overshadowed by physical injuries and significant pain.

2. MTBI symptoms are often confused with symptoms of shock.

3. MTBIs often develop slowly after the exposure to the trauma so that they are not evident at the time of the initial medical encounter.

4. ED and Urgent Care doctors do not ask probing questions-and MTBI patients cannot be expected to volunteer.

5. Even when the symptoms of a concussion are evident, they are overlooked and ignored.

TBI SYMPTOMS DEVELOP PROGRESSIVELY OVER TIME.

The Signs and Symptoms of MTBI often progressively develop over days, weeks, months and years.

Mayo Online Patient Information says that the symptoms of PCS/TBI progressively develop over 7-10.

Other literature says it develops progressively over weeks and months-even years. Vision and vestibular problems develop after months.

Seizures are well known to develop after years. CTE after years.

NFL Football, Maurer, Mornea, Leidner, etc.

DCs, PTs, and MTs PLAY AN VITAL ROLE IN THE DETECTION/DIAGNOSIS OF PCS/TBI.

We are coming out of the Dark Ages regarding Concussions and Mild Traumatic Brain Injuries (MTBIs) regarding sporting injuries.

We are still in the Dark Ages regarding Concussions and MTBIs from other types of trauma.

Many concussions resulting from motor vehicle collisions and other traumatic events are still being seriously overlooked and ignored by the medical community.

Doctors of Chiropractic, Physical Therapists, Massage Therapist, and Accupuncturists can play a vital role in reversing this problem.

MANY CONCUSSIONS/MILD TRAUMATIC BRAIN INJURIES RESULT FROM MOTOR VEHICLE COLLISIONS.

Cassidy reports that 24% of adults injured in motor vehicle collisions have suffered an MTBI.

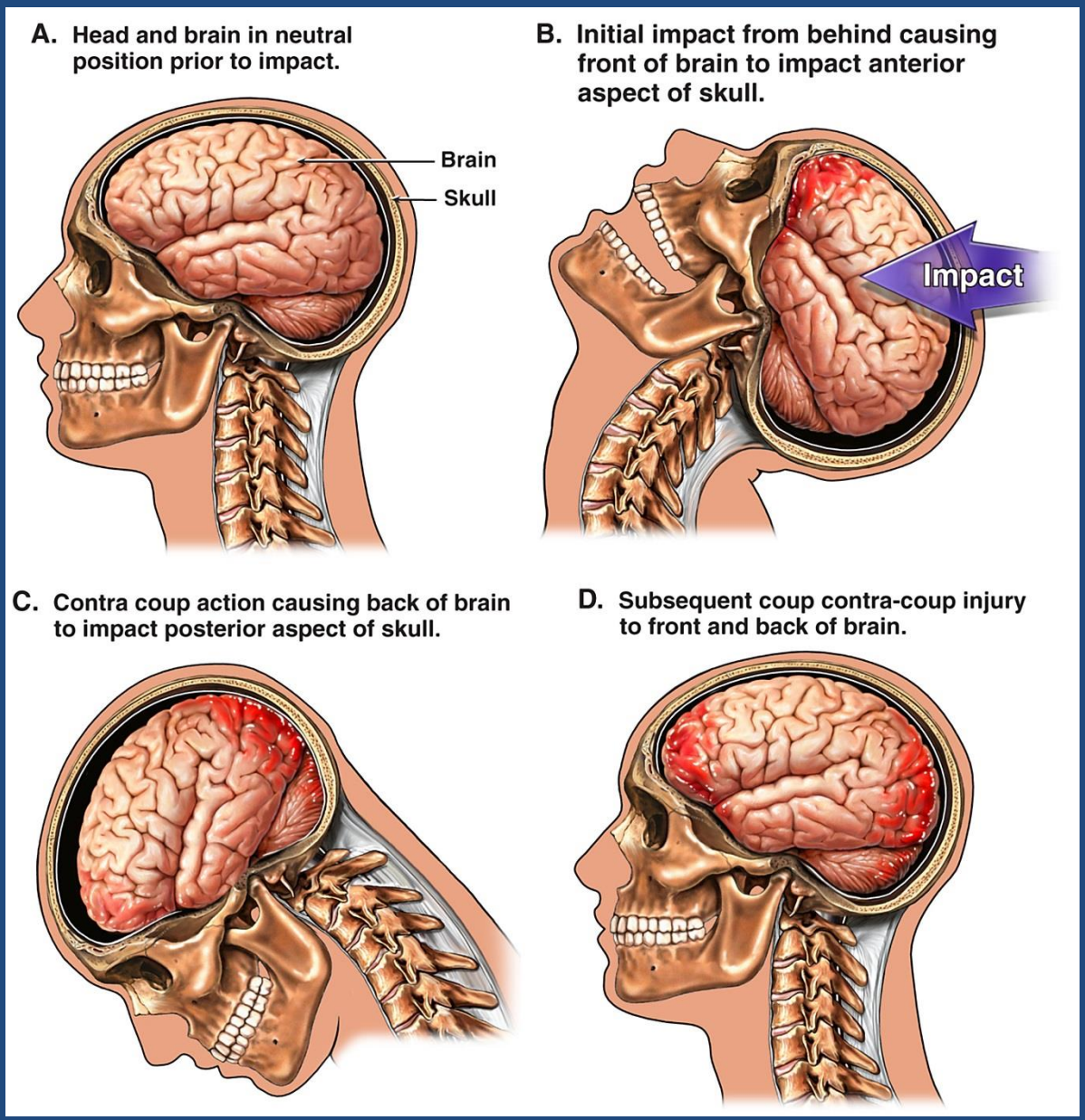
Schmidt Law Firm statistics establish that approximately 60% of the victims of a moderate to severe MVA ($1500 property damage or more) have sustained a significant Concussion (with Rivermead scores of more than 30/64).

CONCUSSIONS AND MTBIs OFTEN OCCUR WITHOUT A DIRECT BLOW TO THE HEAD.

Source: Mayo Clinic.

Other respected medical articles universally agree that a direct blow to the head is not a requirement of a Concussion. Some studies say 90% of sports concussions occur without LOC!

THE IMPACT OF THE BRAIN AGAINST THE SKULL CAUSES TBI.



CONCUSSIONS AND MTBIs OFTEN OCCUR WITHOUT LOSS OF CONSCIOUSNESS

It has been established, beyond doubt, that Concussions and TBIs occur frequently without a loss of consciousness (LOC). The World Health Organization has established an ICD10 Diagnostic Code for “Concussion without LOC”- ICD10 S06.0X0.

McCrea reports that 90% of head injuries occurring in sporting events occur without observable LOC.

Note: ICD10 Code for Post Concussion Syndrome is F07.81.

LOSS OF CONSCIOUSNESS NOT REQUIRED- ALTERATION ENOUGH.

As early as 1966, the Congress of Neurological Surgeons defined concussion as follows:

“a clinical syndrome characterized by immediate and transient post-traumatic impairment of neural functions, such as alteration of consciousness, disturbance of vision, equilibrium, etc. due to brain stem involvement.”

A DELAYED METABOLIC CASCADE CAUSES THE PROGRESSIVE DEVELOPMENT OF CONCUSSION.

Research in the Journal of Athletic Training relates TBI to a "pathophysiologic cascade" with "significant changes in cerebral glucose metabolism" with "abrupt neuronal deplorarization, release of excitatory neurotransmitters, ionic shifts, altered cerebral flow, and impaired axonal function".

"Following concussion, cerebral pathophysiology can be adversely affected… for weeks in humans."

Giza, The Neurometabolic Cascade of Concussion, J. Athl. Train., 36(2):228-235 (2001)

THE MOST ACCEPTED BIOLOGICAL EXPLANATION IS THE CONVULSIVE THEORY.

Shaw, The Neurophysiology of Concussion, 67 ESPNEU4, 281-344 (2002) reviews the 5 different theories of concussion and endorses the Convulsive Theory.

The chief tenet of the convulsive theory is that the symptoms of concussion bear a strong resemblance to those of an epileptic seizure and the energy imparted to the brain by the force generates a turbulent movement of the cerebral hemispheres, increasing the chances of vans interior skull (coup countr coup). This theory explains why the symptoms often endure long after the concussive injury.

The initial concussion produces an acute metabolic crisis in which there is a cascade of increased energy demand of the brain for both oxygen and glucose.

MANY CONCUSSION VICTIMS ARE NOT AWARE OF THE LOSS OF CONSCIOUSNESS.

By definition, a person who is unconscious cannot be expected to be conscious of the fact that he or she is not conscious.

Accordingly, the victim is not the most reliable historian. History from 3rd party observers is far more reliable. (Lezak, Neuropsychological Assessment)

A detailed, probing, searching history is required to accurately rule-in or rule out LOC.

LOSS OF CONSCIOUSNESS CAN BE TOTAL OR PARTIAL

Consciousness is not like a light switch on the wall for is either totally dark or totally bright. It is like the colors of a rainbow that blend from one to another.

Nursing students are taught to grade consciousness in 4 categories:

1. Coma- total unconsciousness:
2. Stupor-severe alteration but not total loss of consciousness;
3. Lethargy-lesser reduction of consciousness; and
4. Total consciousness.

Loss of consciousness can be total or partial. Both are symptoms of a Concussion injury.

Highly respected neurologist Cyril De Courville in his famous textbook on brain injuries, Commotio Cerebrae, described 16 grades of consciousness. The truth is that there are no separate categories. Instead, it is a continuum.

Any reduction in consciousness, even slight, qualifies as an established “loss” of consciousness.

DETERMINATION OF A PERIOD OF LOSS OF CONSCIOUSNESS REQUIRES A SPECIAL HISTORY-TAKING PROCESS.

Proper history taking of a patient to determine whether there has been a loss of consciousness involves the following:

1. Tell the patient that you are asking what they actually remember-not what they think might have happened or what they have been told by others.

2. Admonish the patient to only report what they clearly remember-without filling in the blanks.

3. Ask searching, probing questions.

-Do you remember how your body was moved by the impact?

-Do you remember if your head hit the headrest? If your chest and shoulder were restrained by the seatbelts?

-Was your car moved in the impact? How so?

-How did you manage to get your car off the road and stopped?

-How long did you sit in the car before you got out?

-Do you remember hearing the lights and sirens of the police when they arrived?

THE GLASCOW COME SCALE IS NOT A RELIABLE INDICATOR OF CONCUSSION INJURIES.

Many MTBIs occur even with a Glascow Coma Scale of 15.

Historically, the Glaswcow Coma Scale (GCS) has been used as a screening tool. Many, if not most, MDs wrongly dismiss a patient as concussion-free when the GCS is a 13 to 15,

Wrong!!! The World Health Organization and the US Center for Disease Control now endorse an ICD10 Code for “Concussion without LOC”. (See Giza.)

POST TRAUMATIC AMNESIA IS A BETTER INDICATOR OF MTBI THAN LOC.

Medical literature endorses Post Traumatic Amnesia (PTA) as a Better Indicator of a MTBI than LOC.

Respected medical literature recognizes the existence of Post Traumatic Amnesia (PTA) as a far better indicator of the existence and severity of an MTBI than LOC. Lezak, Neuropsychological Assessment, 5th Ed., Oxford Press (2012)

Caution: It also takes a careful and probing search to accurately determine whether there has been a period of PTA.

Note: Post Traumatic Amnesia is often an "off again-on again" phenomena. Respected medical literature recognizes that the "end point" of the period of PTA is when the period of intermittent amnesia stops. (But, determining when that occurs and the ensuring period of intermittent memory lapses starts is very difficult.) (Lezak)

POOR HISTORY REGARDING LOC, PTA

Just recently, I found the following statement in the record of one of the most respected TBI doctors in the state:

> *There was no loss of consciousness, but she is amnestic to the event.*

How silly? How unprofessional? If the patient was "amnestic", she had no memory. If the patient had no memory, she was not able to state whether there was any LOC!!! An accurate statement would have been this:

> *The patient is amnestic to the event, therefore unable to state whether there was any loss of consciousness.*

LOC can only be determined with a careful history in which the patient is asked probing question about the details of the event that they should be able to remember.

CONVENTIONAL IMAGING IS OF NO VALUE IN DETECTING OR RULING OUT MTBIs

It is a basic non-controversial fact that conventional imaging, MRIs and CT Scans, may establish a hemorhage within the brain after a TBI, but do not rule concussions and mild Traumatic Brain Injuries.

It is believed that there are new imaging techniques which are very expensive that can, in many cases, establish the existence of the type of brain conditions that have been shown to exist in the autopsies of the NFL football players. These techniques are not readily available in mainstream medicine.

The Rivermead Post-Concussion Symptoms Questionnaire*

After a head injury or accident some people experience symptoms which can cause worry or nuisance. We would like to know if you now suffer from any of the symptoms given below. As many of these symptoms occur normally, we would like you to compare yourself now with before the accident. For each one, please circle the number closest to your answer.

0 = Not experienced at all
1 = No more of a problem
2 = A mild problem
3 = A moderate problem
4 = A severe problem

Compared with before the accident, do you now (i.e., over the last 24 hours) suffer from:

	Now					Following Accident				
Headaches	0	1	2	3	4	0	1	2	3	4
Feelings of Dizziness	0	1	2	3	4	0	1	2	3	4
Nausea and/or Vomiting	0	1	2	3	4	0	1	2	3	4
Noise Sensitivity, easily upset by loud noise	0	1	2	3	4	0	1	2	3	4
Sleep Disturbance	0	1	2	3	4	0	1	2	3	4
Fatigue, tiring more easily	0	1	2	3	4	0	1	2	3	4
Being Irritable, easily angered	0	1	2	3	4	0	1	2	3	4
Feeling Depressed or Tearful	0	1	2	3	4	0	1	2	3	4
Feeling Frustrated or Impatient	0	1	2	3	4	0	1	2	3	4
Forgetfulness, poor memory	0	1	2	3	4	0	1	2	3	4
Poor Concentration	0	1	2	3	4	0	1	2	3	4
Taking Longer to Think	0	1	2	3	4	0	1	2	3	4
Blurred Vision	0	1	2	3	4	0	1	2	3	4
Light Sensitivity, Easily upset by bright light	0	1	2	3	4	0	1	2	3	4
Double Vision	0	1	2	3	4	0	1	2	3	4
Restlessness	0	1	2	3	4	0	1	2	3	4

Are you experiencing any other difficulties?

1. _____	0	1	2	3	4	
2. _____	0	1	2	3	4	

*King, N., Crawford, S., Wenden, F., Moss, N., and Wade, D. (1995) J. Neurology 242: 587-592

Proper ICD10 Coding for MTBI is Important.

(ICD10-S06.0x0)-Concussion without LOC

ICD10-S06.0x1-conccusion with LOC of 30 minutes or less.

(ICD10-310.2) Postconcussion syndrome

(ICD10-F07.81) Postconcussional syndrome

Note: Coding for all of the symptoms of a PCS, headache, dizziness, etc. is appropriate.

VISION SYMPTOMS ARE VERY IMPORTANT

Throughout human history, checking for double or blurred vision has been recognized as perhaps the most basic screening tool. “”How many fingers do you see?” may sort out the worst-but, if used as the sole or principle screening tool, will overlook the large majority of concussions.

More searching questions include “Are you having any of the following:

-Fatigue with reading or working at the computer?

-Difficulty tracking from line to line with reading?
-Difficulty focusing from near to far and far to near? (convergence disorder)

-Difficulty in scanning the horizon? (Slowed saccades)

-Sensitivity to lights?

-Eyes not tracking together (4th nerve palsy)

MTBIs CAUSES PERMANENT POST CONCUSSION SYNDROME WITH LONG TERM DISABILITY.

A Significant Number of Concussion Injuries Develop Into Post Concussion Syndrome and Long Term Disability.

Statistics from the Department of Defense show that almost 20% of the soldiers returning from Iraq and Afghanistan are diagnosed with MTBI at the time of post-deployment medical evaluation who were not diagnosed or treated previously.

Other studies show that 23% of the victims of MTBI have long term, permanent residuals. CITE

MTBI CASE PSYCHIATRIC DISORDERS.

The largest medical study showed that TBI victims have significantly greater incidence of the development of psychiatric disorders. Orlovska, Head Injury As a Risk Factor for Psychiatric Disorders, Am.J.Psychiatry, 171(4):463-9 (2014) reports that a study involving 113,906 victims of head injury showed the increased incidence of the following psychiatric disorders after head ain injury:

-65% increase in schizophrenia;
-59% increase in depression;
-28% increase in bipolar disorders;
-439% increase in organic mental disorders (psychosis, mania)

Note:Rapoport reports that depression is more common in MTBI than TBI!!!

TBIs CAUSE SECONDARY DYSTONIA

The Dystonia Society online publication states,

> *Secondary dystonia can sometimes appear after trauma to the back brace via physical injury or stroke. Where the injuries to the head, the symptoms often affect the side of the body, which is opposite to side of the brain injury.*
>
> *Secondary dystonia can also result from an injury to a part of the body other than the brain; for instance, neck dystonia sometimes follows whiplash… The symptoms may not respond to sensory tricks and may persist during sleep.*
>
> *Symptoms may also be paroxysmal, which means they occur in episodes rather than being constant.*
>
> *Dystonia following brain injury/damage may not appear for several months or (more rarely) several years after injury.*

SEVERE WHIPLASH INJURIES PRODUCE SYMPTOMS SIMILAR TO CONCUSSIONS.

It is well established in the medical literature that many of the symptoms of a concussion injury are similar to those which are commonly seen in severe whiplash injuries, including the following:

-Headache;
-Dizziness/light-headedness;
-Poor concentration/ memory;
-Ringing of the ears;
-Difficulty sleeping.

Source: Whiplash Related Disorders, published online by the North American Spine Society (NASS)

THE RIVERMEAD IS A USEFUL TOOL THAT SHOULD BE USED AT 3 MONTHS POST-INJURY.

Because of the progressive delayed of the symptoms of PCS/MTBI, it is recommended that the Rivermead questionaire be successively used, with the 3 month anniversary being important.

Ingebrigtsen, Quantification of Post Concussion Symptoms 3 Months After Minor Head Injury, J. Neurol. 1998 Sept:245(9):609-12.

VA/DOD CALLS FOR 30 DAY REVIEW OF CONCUSSIONS.

The VA/DOD Clinical Practice Guideline for Management of Concussion in TBI recognizes that the symptoms of Concussion/mTBI call after 30 days should be considered unlikely to be concussion related and that for close monitoring for concussion/mTBI related symptoms over the initial 30 days.

Three months has been determined to be the most reasonable period of latency for post-traumatic headaches. It is well known that seizures can result from TBIs after years. Evans.

INCREASED RISK OF DELAYED SEQUELAE OF TBI

A TBI increase the risk of subsequent problems:

Depression Xs 10;

Seizures Xs 2-5:

Psychotic disorders Xs 2-5

Dementia Xs 4-5

Risk of another TBI Xs2 (Blyth)

Risk of another TBI after 2nd TBI Xs 8

Source: Gualtieri, The Delayed Neurobehavioural Sequelae of Traumatic Brain Injury, Brain Injury Journal, Vol 5: 3, 219-232 (2009) Three months has been determined to be the most reasonable period of latency for post-traumatic headaches. Evans.

SYMPTOMS OF TBI DO NOT RESOLVE WITH LITIGATION

Several authorities have confirmed that the symptoms of TBI do not resolve with settlement of litigation.

Evans, Posttraumatic Hadaches in Civilians, soldier and Athletes, (2014) 32 ENLGC 2:283-303;Packard, Postraumatic Headache: Permanance and Relationship to Legal Settlement, Headache: Vol 32, 495-500(1992)

VESTIBULAR DISORDERS CAN RESULT FROM TBI.

TBIs can involve injury to the brain stem which produces vestibular disorders such as

-Dizziness (vertigo) and Balance dysfunction (VVBPPV)

-Hearing deficits;

-Vision dificits.

Source: Thompson, Vertigo: A Review of Common Peripheral and Central Vestibular Disorders, Ochsner Journal, 9:20-26 (2009); Vision Challenges with Vestibular Disorders, Vestibular Disorders Association, online information at www.vestibular.org.

Thank you for attending!!!

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