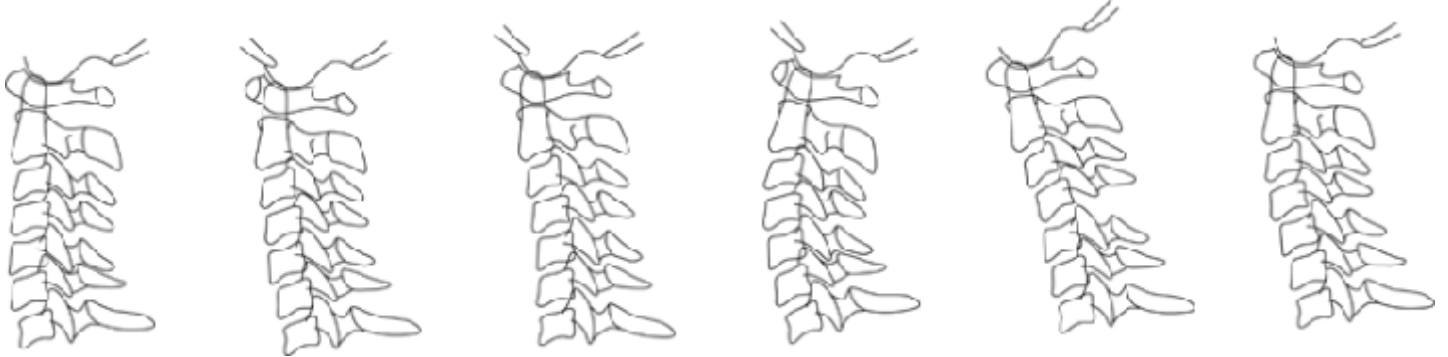


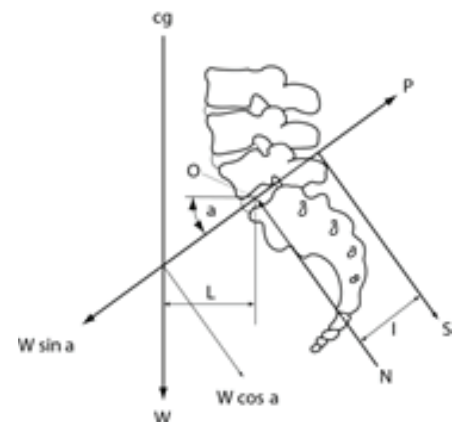
ARIZONA ASSOCIATION OF CHIROPRACTIC PERSONAL INJURY QUARTERLY

Volume 2, Issue 1



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Arthur Croft's Farewell Tour



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The AAC Personal Injury Quarterly

2018—1st Quarter— Issue 1

A special thanks to Dr. Bill Gallagher for his tireless efforts and dedication to seeing this publication through!

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Why A Personal Injury Quarterly?

By Bill Gallagher, DC

There are several reasons why the AAC personal-injury committee chose to publish this quarterly magazine. First and foremost we realized the need for the state association to stay in communication with not only its members, but every practicing chiropractor in Arizona. Beyond personal-injury, this magazine will also keep you up-to-date on what is happening with your state and your state association.

The question then goes to why a quarterly magazine on personal injury?

The answer to that question is simple. Every chiropractor, regardless of technique or philosophy, needs to know more about personal injury work.

I created the American Academy of Motor Vehicle Injuries to teach doctors how to diagnose, document, and manage a personal injury case. When I teach, I have no reservation about telling the class that everything I teach is a mistake I have already made and hopefully you won't.

I do not expect every doctor who reads this to enroll in our 150 hour certificate program or to go on for the 300 hours to earn board certification as a Diplomate in

Motor Vehicle Injuries. I do know however, the odds are that if you are in practice, you will see personal injury cases.

Statistically the odds of anyone being in a motor vehicle collision in any given year is 1 in 25 which means for every hundred files you have on your shelf, chances are 4 of them may call you after being in a crash.

As a chiropractor you have the tools to help everyone. Unfortunately, we do not have the tools to fix everything. Knowing when and where to refer a patient whose injuries exceed our scope of practice is not only essential to protect us from malpractice, but is even more important to ensure patients receive the care they deserve.

I trust as you read through this quarterly magazine you will find plenty of information that you will be able to incorporate into your practice right away. Know too that the advertisers are those more intimately familiar with personal injury work and are there to support you when needed.

Differentiating Injuries from a Second Motor Vehicle Collision

By Jeff Woolston, DC, CMVI

What do you do when you have a patient who experiences two motor vehicle collisions (MVC) very early in care? How do you go about differentiating between the injuries from both crashes when the symptoms are the same? For a personal injury case, as the treating doctor, you need to be able to determine if the injuries from the second crash is an exacerbation or an aggravation of the original symptoms.

I faced this scenario recently with a 17-year-old female who started treatment following a rear-end collision, who was then rear-ended again three weeks later.

The patient showed limited improvement up to the time she suffered the second MVC. All the symptoms were the same with the same positive neurological findings. The only changes were subjective, as her VAS numbers increased. Her neurologist and general practitioner were unable to document any differences between her symptoms from crash # 1 and crash #2, so the attorney turned to me for answers.

Thankfully, I had just completed a class through the American Academy of Motor Vehicle Injuries (AAMVI) with Dr. Jeff Cronk, DC, JD, from Spinal Kinetics, which provided me with the insight I needed to tackle this case. Spinal Kinetics analyzes stress X-rays using Computerized Radiographic Mensuration Analysis (CRMA), which follows the American Medical Association's Guides to the Evaluation of Permanent Impairment.

As part of the personal injury work-up, I took the Davis series x-rays with APOM lateral bending after both crashes. I sent the films to Spinal Kinetics, and had a board certified medical radiologist analyze the films. The CRMA information provided me with the information I needed to determine the differences between the two injuries.

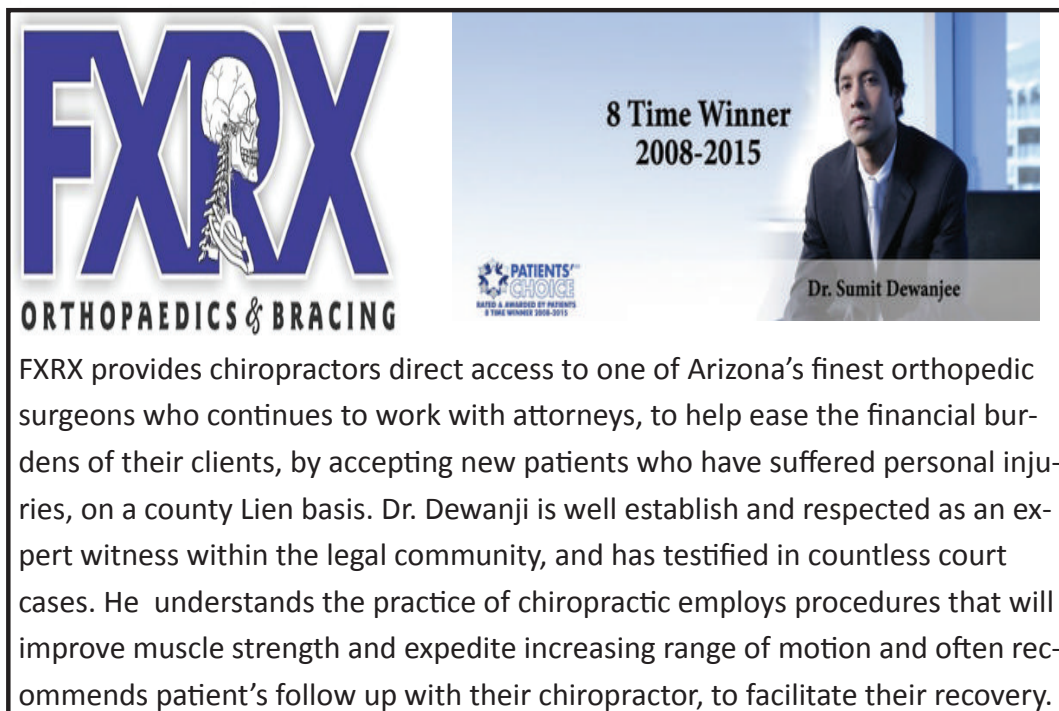
The initial injury x-rays showed that the atlas lateral shift was 0.63mm during left lateral bending and 2.20mm during right lateral bending. A lateral shift of atlas on axis greater than 1.7mm is considered significant and usually carries a poor prognosis. Angular motion segment integrity was normal. The translation motion segment integrity was abnormal at C2, C3, C4, and C5. The patient's digital analysis revealed C2= 1.65mm, C3=2.14mm, C4=1.87mm, and C5=1.11mm. These abnormal measurements revealed that the patient had spinal ligament damage/sub-failure and a documentable clinically significant ligament injury.

The second set of x-rays showed atlas lateral shift of 3.79mm during left lateral bending and 3.67mm during right lateral bending. This showed increased damage to the alar/accessory ligament of 3.16mm on the right and 1.47mm on the left. Additionally, the cervical motion study indicated angular motion segment integrity changes at C3. This patient's digital analysis revealed loss of motion integrity at C3= 13.39 degrees which yielded an impairment estimate based on plain film forensics at 25%.

Motion segment integrity translational variation was abnormal at C2, C3, and C4. This patient's digital analysis revealed C2= 1.27mm, C3= 3.45mm, and C4= 1.81mm. Having the CRMA information allowed me to conclusively determine that my patient's abnormal measurements indicated spinal ligament damage/sub-failure, which was a clinically significant ligament injury.

Because I was able to differentiate the two injuries, we were able to appropriate responsibilities to both crashes. This is just a sample of the great information you will learn taking the American Association of Motor Vehicle Injuries seminars series.

Dr. Jeff Woolston practices with his wife Dr. Larissa Woolston in Scottsdale. He has completed the AAMVI certification and is a delegate for the Arizona Association of Chiropractic.



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Croft's Farewell Tour

I started teaching orthopaedics way back in 1986. I then taught a 1-weekend whiplash program for LACC back in 1988. The multi-module whiplash program evolved from that in 1992, thanks to the encouragement and resourcefulness of my wife, Holly, and we've been at it now for 26 years. But, as they say, all good things must come to an end, and so it is with our Whiplash Injury Biomechanics and Traumatology program. I will retire from teaching after the 2018 season and continue with my full time forensic practice as a recovered academic.

This will also be the final year of the Annual SRISD Scientific Conference, so this will naturally be the last chance to obtain advanced certification from SRISD and join the few and the proud apex experts in the world. Our website will remain up indefinitely, however, so graduates can still display their certification for the world to see.

The good news is that we are planning to do more crash testing which we suspended in 2006 so that I could finish my PhD. The plan now is to put on another exciting CRASH Program in 2019 here in



San Diego. As always, this program will be limited to 100 attendees, and it fills up quickly, so watch for the postcard!

I will always be eternally grateful for our enthusiastic supporters who have, in many cases, been like Grateful Dead fans to us over these many years. I am always thankful for the many emails, letters, and phone calls we get assuring us that we have indeed made a difference in this field and in so many personal injury practices around the country. So I encourage you all to make plans to join us for one final stimulating year in the trenches of whiplash traumatology.

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The Importance of Proper Diagnosis in PI

Bill Gallagher, DC, CMVI

The American Academy of Motor Vehicle Injuries places a huge emphasis on diagnosis. Half of the course is directly devoted to learning how and what to look for in making a proper diagnosis.

Diagnosing a personal injury case is a double-edged sword with either edge capable of cutting your case down right from the start. The first problem most commonly seen is a diagnosis of sprain/strain injuries. With the implementation in 2018 of ICD 10 codes, sprain/strain need to be posted separately. For most chiropractors, that means using a diagnosis of sprain while for most medical doctors it comes down to using strain.

The problem with using a sprain diagnosis lies within the insurance company's computers which interpret this as a minor injury with the assumption that it should resolve in 6 to 8 weeks. They are working on the thinking that a cervical sprain is no worse than a simple twisted ankle. Sadly, there is not enough spine or ankle research to dissolve the misconception that resolution will occur to damaged (ie, sprained) ligaments within 2 months.

The other diagnosis of strain is an even greater problem for a personal injury case. By definition a strain involves muscle. A plethora of research and literature supports the contention that muscle will heal. On this basis alone, a 6 to 8 week limit is a strong position in

favor of the insurance industry.

Another problem is that except in the case of very minor injuries that would fit into the Croft guidelines as a grade 1 sprain/strain injury, neither of these diagnoses is correct by the Croft guidelines. A grade 1 sprain/strain injury is one where there is no limitation of motion, no ligamentous injury, and no neurological findings on examination. Even so, the guidelines allow for 21 visits over a period of 10 weeks.

The greatest problem here is not the minimal diagnosis of sprain or strain. The problem is that if the patient has not gotten better there is likely a far greater injury involved. Doctors having completed the certification program with AAMVI know what injuries to look for and how and when to test for them.

Studies have shown that between 40 and 67% of the people diagnosed with a simple strain injury have been incorrectly diagnosed. If that wasn't bad enough there is a greater concern; those same studies found that half of those patients misdiagnosed required surgery. I will grant you facet injection is a surgical procedure but when a lawyer presents that facet injection needle to a jury, it carries tremendous weight.

All of this means that the attorney will have a better chance of getting a good settlement offer. When the attorney gets that larger settlement it also means the doctor stands a better chance of being paid in full. Most importantly when the injuries are properly diagnosed and treated it means the patient will receive the care they need and deserve.

PAIN MANAGEMENT 101 – PART TWO

By Trever Penny, DC, MUA CICE

Have you ever found that you were unable to effectively adjust a patient at the same location on numerous subsequent visits? The patient is very uncomfortable, the tissue is very tight, and there is no way to get to that “spot”. What if a few trigger point injections numbed the pain, decreased the inflammatory process, relaxed the muscles, and increased the circulation. Would you be able to now provide more effective care? I believe you would. I have seen it myself.

How are you currently treating those few patients with radicular arm or leg pain? Do you just PUNT? What if the pain specialist performed a facet injection, or an epidural injection? Now you can conservatively treat the location. You’re not going to remove the stenosis or disc herniation, but it is now likely your care will allow the patient to postpone surgery for a few more years.

This management of your patient’s pain is what the interventional doctors need. You must grasp the idea that the board-certified pain specialists have come to the realization that they can’t do it all by themselves. They need us! And in some cases, we can’t do it all and therefore need them; this is called co-management or cooperation. It is good for the patient and inevitably good for us, individually and as a profession. It is important to stand proud as Doctors of Chiropractic in this 21st century and share the increasingly important and needed role of co-managing the pain patient.

WE HAVE A COMMON GOAL, SO LET’S WORK TOGETHER

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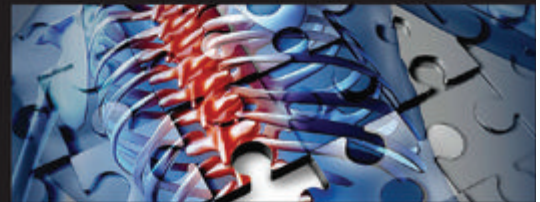
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Mechanism of Injury with Concussions/TBI: Rear Impact

By Bill Gallagher, DC, CMVI & Lois Laynee

Most of our knowledge about concussions and how they are defined points more to our lack of knowledge about concussions and dramatic brain injuries. The term is used interchangeably as both a diagnosis of the condition as well as the mechanism of injury that causes the damage.

The CDC as far back as its report to Congress in 1996 dropped “mild” from mild traumatic brain injury. This is due to the realization that what might be considered a relatively mild concussion or mild traumatic brain injury is very simply a traumatic brain injury.

As is the case with diagnosing any problem, understanding the mechanism of injury can be a powerful means of choosing the more precise diagnosis. Studies done on baboons in the 1970’s and published in the *Journal of the Society of Automotive Engineers* were able to measure the changes in pressure to the brain with varying change in motion of the head and neck.

While the baboons were “humanely euthanized”, doing similar research today on live human subjects would be unethical based on the knowledge that injury would be likely from the testing research. On that basis alone, it is clear that we do know that the brain can be injured in a motor vehicle collision.

There are multiple factors to consider in the mechanism of injury with concussion and for this article we will focus on the cerebrum. Without getting into the calculation of the physics formulas that would measure the different g forces imposed on the vehicle, occupant torso, occupant’s cervical spine, occupant’s head, and occupant’s brain it is simple enough to understand that each of those forces will be different. This relates to differences in the structure, musculature, and density of the structures involved.

For the brain itself, the mass of white and gray matter protected by the cranium and cerebral spinal fluid, the first thing to understand is that it has a different density than the bones of the cranium. In a crash the skull and brain, being of different densities will accelerate at different rates. Just as a rear-impact to a vehicle does not have an immediate impact on hyper-flexion and extension of the occupant’s cervical spine, the acceleration of that head and neck occur independently of the acceleration of the brain inside the head.

After the head and neck have gone into hyper-extension the action of hyper-flexion will cause an impact to the occipital lobe of the brain catapulting it forward. This alone will have at least a minimal



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effect on the occipital lobe. As the head and neck have completed hyper-flexion and is thrown back again into extension there is a second impact of the frontal lobe moving forward on the inside of the frontal bone that is moving posteriorly. One in motion the brain can be subjected to multiple impacts until it comes to rest.

We will discuss this in greater detail in future articles but for right now this simple flexion extension motion crossing opposing catapulting of the brain into posterior and anterior motion will cause impact to the frontal and occipital lobes. This is the primary reason why visual disturbances are so common after a crash. This too is the main reason that victims will suffer anxiety and personality changes. For most these will be minor symptoms but it is also common if you ask the right questions, to find that your patient is now arguing with everyone since the crash. It is also not unusual if you ask the right questions, to find that their marriage is on the rocks.

So much for mild traumatic injury.

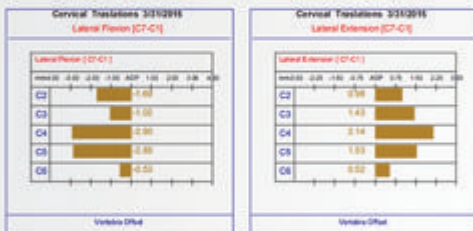


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Review: Concussion/TBI biomarkers in research strategies Cited by >100/** | >1000/* State, Country, Univ, Dept, or Lab**

By Robert L Menner Dc, BsPT, DABFP, CCWP, DABFM, CMVI



Traumatic brain injuries are perplexing and problematic—and they affect millions of Americans. It has been estimated that up to 3.8 million Americans incur mild traumatic brain injuries (MTBI) or concussions in sports-related activities and approximately 50 percent of the injured do not report the injury to a health care professional. More likely than not, millions of mTBI are not reported to health care providers as a result of sporting activities, motor vehicle accidents, work-related injuries and military operations. 1-ACAToday... Traumatic Brain Injury (TBI) has gained attention in the past decade as a “signature injury” in the conflicts in Iraq and Afghanistan. TBI is a major burden for both the military and civilian population in the US and worldwide. It is a leading cause of death and disability in the US and a major health services resource burden. The evidence also supports the existence of racial/ethnic, gender, insurance, geographic disparities in the US as well as other unique disparities worldwide. 2-VA Health Equity and Rural Outreach Innovation Center (HEROIC)... and SC Medical University of South Carolina

Cerebral concussion is followed by a complex cascade of ionic, metabolic, and physiologic events. The earliest changes are an indiscriminate release of EAAs and a massive efflux of K^+ , triggering a brief period of hyperglycolysis. This is followed by more persistent Ca^{2+} influx, mitochondrial dysfunction with decreased oxidative metabolism, diminished cerebral glucose metabolism, reduced cerebral blood flow (CBF), and axonal injury. Late events in the cascade include recovery of glucose metabolism and CBF, delayed cell death, chronic alterations in neurotransmission, and axonal disconnection. 3-CA UCLA Neurotrauma Laboratory**** Currently, the Glasgow Coma Scale (GCS) is the primary selection criterion for inclusion in most TBI clinical trials. While the GCS is extremely useful in the clinical management and prognosis of TBI, it does not provide specific information about the pathophysiologic mechanisms which are responsible for neurological deficits and targeted by interventions. On the premise that brain injuries with similar pathoanatomic features are likely to share common pathophysiologic mechanisms, participants proposed that a new, multidimensional classification system should be developed for TBI clinical trials. 4-KY Univ. of Kentucky and Workshop Scientific Team and Advisory Panel Members-Collabrators(31)***

The stress response is mediated largely by the hypothalamic-pituitary-adrenal (HPA) axis and the sympathoadrenal system. In general, there is a graded response to the degree of stress. Cortisol and catecholamine levels correlate with the type of surgery, the severity of injury, the Glasgow Coma Scale and the APACHE score. Adrenal cortisol output increases up to ten-fold with severe stress.... In patients with shock, plasma concentrations of epinephrine increase 50-fold and norepinephrine levels increase 10-fold. The adrenal medulla is the major source of these released catecholamines. Adrenalectomy eliminates the epinephrine response and blunts the norepinephrine response to hemorrhagic shock. The increased release of stress hormones results in multiple effects (metabolic, cardiovascular and immune) aimed at restoring homeostasis during stress. The HPA axis, sympathoadrenal system and proinflammatory cytokines (TNF- α , IL-1 and IL-6) act collectively and synergistically to induce stress hyperglycemia. 5-VA Critical Care Medicine and AUSTRALIA Intensive Care Research Center***

The number of sports-related concussions has been steadily rising in recent years. Diminished brain resilience syndrome is a term coined by Wendy A. Morley to describe a particular physiological state of nutrient functional deficiency and disrupted homeostatic mechanisms leading to increased susceptibility to previously considered innocuous concussion. Many modern day environmental toxicant exposure, along with major changes in our food supply and lifestyle practices, profoundly reduce the bioavailability of neuro-critical nutrients such that the normal processes of homeostatic balance and resilience are no longer functional. Their diminished capacity triggers physiological and biochemical ‘work around’ processes that result in undesirable downstream consequences. Exposure to certain environmental chemicals, particularly glyphosate, the active ingredient in the herbicide, Roundup, may disrupt the body's innate switching mechanism, which normally turns off the immune response to brain injury once danger has been removed. 6-MA MIT Spoken Language Systems Group, Computer Science and Artificial Intelligence Laboratory**

A controversial term first described by Saunders and Harbaugh³ in 1984, Second Impact Syndrome (SIS) consists of two events. Typically, it involves an athlete suffering post-concussive symptoms following a head injury. If, within several weeks, the athlete returns to play and sustains a second head injury, diffuse cerebral swelling, brain herniation, and death can occur. SIS can occur with any two events involving head trauma. While rare, it is devastating in that young, healthy patients may die within a few minutes. Emergency physicians should be aware of this syndrome and counsel patients and their parents concerning when to allow an athlete to return to play.. When in doubt after a severe concussion, the athletes should not resume play. When in doubt, sit them out is always the safer decision. 7-CA Univ. of California Irvine School of Medicine and DE Christina Care Emergency Medicine***

Neuropsychological testing seems to be an effective way to obtain useful data on the short-term and long-term effects of mild traumatic brain injury. Moreover, knowledge of the various definitions and management strategies, as well as the utility of neuropsychological testing, is essential for those involved in decision-making with athletes with mild traumatic brain injuries. 8-PA Department of Neurosurgery, University of Pittsburgh***

Access to the clinical laboratory by chiropractors is an important issue in the context of the role of the chiropractor as a primary health care provider and the public's right to optimal health care in the most efficient and cost-effective manner possible. In its efforts to gain the right to do so in Canada, the profession will have to identify and be able to justify the use of tests that would enhance the ability of its constituents to participate in the delivery of health care more effectively. 9-Canada (CMCC) Canadian Memorial Chiropractic College Div. of Biological Sciences, Graduate Studies and Research, and Director of Continuing Education.

Maintain Clinical Focus when mapping the biomarker indices'.

CMP (Complete Metabolic Panel- Glucose which has a chemical structure similar to Vitamin C.

In Canada a study revealed any episode of hyperglycemia (≥ 11.1 mmol/l or 200 mg/dl) was associated with 3.6-fold increased risk of hospital mortality in patients with severe TBI and thus, should be avoided. [10-Canada Department of Anesthesiology, Pharmacology and Therapeutics, University of British Columbia](#) Whereas in Iran they concluded that admission hyperglycemia is related with increased death rate in head injury patients; moreover, it can also be a cause of mortality in the ICU. Key points were Hyperglycemia is linked with amplified mortality rate in head injury patients, Shorter hospital length of stay is a consequence of the elevated mortality rate in patients with higher blood glucose levels (ie, ≥ 200 mg/dL), and Comprehensive treatment of hyperglycemia can improve the outcome of severe head injury patients. [11-Iran Mazandaran University of Medical Science, Sari, Iran](#)

Hypoglycemia Unawareness -- Normally, symptoms such as shakiness, sweating, and palpitations occur when blood glucose levels drop below 70 mg/dL. In people with autonomic neuropathy, symptoms may not occur, making hypoglycemia difficult to recognize. Problems other than neuropathy can also cause hypoglycemia unawareness.

Eyes -- Finally, autonomic neuropathy can affect the pupils of the eyes, making them less responsive to changes in light (CN3). As a result, a person may not be able to see well when a light is turned on in a dark room or may have trouble driving at night. Focal neuropathy affects eyes, facial muscles (CN5&7), ears (CN8) and other areas of the body. Focal neuropathy may cause, inability to focus eyes (CN2), double vision (CN6), aching behind one eye, paralysis on one side of face, called bell's palsy (CN7) and additional pain symptoms. [12-Gov National Institutes of Health /National Institute of Diabetes and Digestive and Kidney Diseases](#)

Reduced cerebral blood flow (CBF) was also significantly correlated with increased levels of dialysate potassium. This may be due to either cell swelling or altered vasoreactivity in cerebral blood vessels caused by higher levels of potassium after trauma. Additional studies in which potassium-sensitive microelectrodes are used are needed to validate these ionic events more clearly. [13-VA Department of Biostatistics, Medical College of Virginia, Virginia Commonwealth University](#)

The intracellular free calcium concentration subserves complex signaling roles in brain. Calcium cations (Ca^{2+}) regulate neuronal plasticity underlying learning and memory and neuronal survival.... Dysregulation of Ca^{2+} is decisive for brain cell death and degeneration after ischemic stroke, long-term neurodegeneration in Alzheimer's disease, Parkinson's disease, Huntington's disease, inflammatory processes, such as in multiple sclerosis, epileptic sclerosis, and leucodystrophies. [14-Germany Institut für Neurobiochemie, Medizinische Fakultät der Otto-von-Guericke-Universität Magdeburg***](#)

A Walter Reed Army Institute of Research center study revealed an acute decrease in alkaline phosphatase after brain injury. These results reveal that both blast- and impact acceleration-induced head injuries cause an acute decrease in the level/activity of tissue non-specific alkaline phosphatase (TNAP) in the brain, which potentially contributes to trauma-induced accumulation of pTau and the resultant tauopathy. The regional changes in the level/activity of TNAP or accumulation of pTau after these injuries did not correlate with the accumulation of amyloid precursor protein, suggesting that the basic mechanism underlying tauopathy in TBI might be distinct from that associated with AD. [15- Gov Blast-Induced Neurotrauma Branch, Center for Military Psychiatry and Neuroscience, Walter Reed Army Institute of Research](#)

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HEMOGLOBIN A1c W	A1c	DIABETES MKRS	
INSULIN	INSULIN		

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DRAW FEE, PSC SPE	DRAW		
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HOMOCYSTEINE, CAR	HCY		
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Vit B12 and Folate	B12/Folate		CMCC
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Reticulocyte count	Retic ct	Bleed	
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Co Enzyme Q 10	CoQ10		
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IGF-1	IGF-1		
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Calcium, Ionized	Calcium, Ionized		
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IODINE urine test	Iodine		
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Catecholamine's	Catecholamine's (Ref In AAC PI Qrtly article)		
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T-3, TOTAL	T3 tot	THYROID	
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T-3, UPTAKE	T3 up		
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T-4, FREE	T4 free		
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T-4 (THYROXINE)	T4 tot	Concussions/TBI	
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THYROID PEROXIDE A	TPO		
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TSH	TSH	Concussions/TBI	CMCC
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T-3, FREE	T3Free03	Concussions/TBI	
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T-3, REVERSE	T3Rev		
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DHEA	DHEA	HORMONES	
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PREGNENOLONE			
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PROLACTIN	Prl	Concussions/TBI	
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PSA free & tot			CMCC
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[H Stephen Injevan, MSc, PhD, DC, Allan C Gotlib, BSc, DC and John P Crawford MSc, PhD\(Path\), DC The clinical laboratory in chiropractic practice: what tests to order and why? J Can Chiropr Assoc. 1997 Dec; 41\(4\): 221-230.](#) **CMCC**

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Headaches Resultant of Motor Vehicle Accidents

Gregory Katsaros, DC, DAAPM

Introduction

Headaches are commonly resultant of motor vehicle accidents (MVA). While most headaches secondary to MVAs are benign and can be treated quite effectively, the possibility of more serious types can occur and need to be ruled out. The varying types of headaches, along with their mechanism of injury have both important therapeutic and prognostic differences.

Discussion

Cervicogenic and Tension Type Headaches

The typical headache secondary to cervical acceleration-deceleration (CAD) / whiplash injury that does not include direct head trauma is a cervicogenic headache. Cervicogenic headaches are classified as secondary type headaches. The headache itself generally results from pain and tightness of the neck and upper back. The headache pain is typically noted at the base of the skull; however, it may also include pain which radiates from the neck to the front of the head.

Tension headaches are another type of headache which often occur following whiplash type injuries. These are the most common overall type of headache, and described as dull, achy, and non-throbbing. It characteristically demonstrates as a band pattern across the forehead and is generally associated with neck tightness.

There is often a confusion in differentiating between the phenotypes of cervicogenic and tension type headaches. The main differentiating factor between the two is whether the primary locale of the headache is about the cervical spine or whether the headache predominantly demonstrates as a band pattern across the forehead. It is important to note that both headaches can also be present simultaneously.

While direct head trauma is not necessary for the development of a more serious type of headache, the likelihood does increase with direct trauma to the head. When a closed head injury is coupled with a CAD injury, it is important to discern the type of headache that is presented, and to understand that multiple headache phenotypes may be present.

Closed Head Injuries

Headache is the most common symptom after a closed head injury. With the commonality of headaches within the population, there is always a likelihood of a type of headache pre-existing prior to a closed head injury. As such, a new headache type occurring following a closed head injury is called an acute post-traumatic headache. If the post-traumatic headache persists beyond the first two months post injury, it is referred to as chronic post-traumatic headaches. Without proper treatment and improvement, unresolved post-traumatic headaches may

transform into chronic daily headaches. It is important to distinguish any previous headaches from post-traumatic headaches, as trauma-induced headaches are usually heterogeneous in nature and may symptomatically overlap preexisting headaches.

Headache is estimated in 30% to 90% of patients after mild head injury, and up to 50% of these patients will develop a post-concussion syndrome. Approximately 20% of patients have persistent post-traumatic headaches for more than 1 year, which may not resolve despite the settlement of any pending litigation (3).

Closed head injuries often result in a various types of brain injuries. These can be generally divided into two main groups: Mild Traumatic Brain Injuries (mTBI) and Traumatic Brain Injuries (TBI). An mTBI, otherwise known as a concussion is the more common of the two.

Traumatic brain injuries are described as: any period of loss of consciousness, any loss of memory for events immediately before (retrograde amnesia) or after (anterograde amnesia) the accident (collectively referred to as the period of post-traumatic amnesia, or PTA), any alteration in mental state at the time of the accident (e.g., feeling dazed, disoriented, or confused), or focal neurologic deficit(s) that may or may not be transient (2).

When there is any concern of either impairment or loss of consciousness, the Glasgow Coma Scale (GCS) is employed. The Glasgow Coma Scale is a neurological assessment of consciousness of individuals involved in acute brain injuries.

The Glasgow Coma Scale is based upon the patient’s response of eye movements, verbal responses, and motor responses to commands or stimuli, and is scored from 3-15.

Glasgow Coma Scale

Best Eye Response (E)	Spontaneous – open with blinking at baseline	4
	Opens to Verbal command, speech, or shout	3
	Opens to Pain, not applied to face	2
	None	1
Best Verbal Response (V)	Oriented	5
	Confused conversation, but able to answer questions	4
	Inappropriate responses, words discernable	3
	Incomprehensible speech	2
	None	1
Best Motor Response (M)	Obeys commands for movement	6
	Purposeful movement to painful stimulus	5
	Withdraws from pain	4
	Abnormal (spastic) flexion, decorticate posture	3
	Extensor (rigid) response, decerebrate posture	2
	None	1

(Continued on Page 18)

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GCS Score	Correlate
13-15	Mild Brain Injury
9-12	Moderate Injury
8-3	Severe Brain Injury

While the single score gives an idea of the extent of the injury, it is essential to evaluate each of the individual components, such as E3V3M5 = GCS 11.

The GCS is only part of the criteria used in describing patients with mTBI or TBI. Other factors include any time of loss of consciousness and any post traumatic amnesia (PTA). The American Congress of Rehabilitation Medicine (ACRM) definition of mild TBI includes only those injuries in which loss of consciousness is 30 minutes or less, the GCS score at 30 minutes after injury of 13–15, and the duration of PTA being no longer than 24 hours. Injuries exceeding these criteria are considered to be of more than mild severity (2).

TBI is typically categorized based on injury severity (3):

Severity	GCS	AOC	LOC	PTA
Mild	13-15	≤ 24 Hours	0-30 minutes	≤24 Hours
Moderate	9-12	>24 Hours	>30 minutes <24 Hours	>24 Hours <7 Days
Severe	3-8	>24 Hours	≥24	≥7 Days

- GCS - Glasgow Coma Score
- LOC - Loss of consciousness
- AOC - Alteration of consciousness
- PTA - Post-traumatic amnesia

Both mTBI and TBI can have long term negative ramifications. Mild Traumatic Brain Injury may occur when the head hits an object, or a moving object strikes the head. It can lead to headaches, changes in alertness, and loss of consciousness among other symptoms. While the signs and symptoms are obvious, radiographic demonstration of mTBI has generally been lacking. However, recent advances in MRI techniques have shown some promise in demonstrating correlates of mTBI.

DTI – MRI Imaging

Diffusion Tensor Imaging (DTI) is a specialized technique used with MRI to measure the flow of water molecules within and along axons in the brain's white matter. The technique provides information on Fractional Anisotropy (FA). Low Fractional Anisotropy (FA) indicates relatively disorganized movement of water molecules, whereas high FA indicates more organized movement of water molecules. Low FA has been shown to be associated with worse outcomes after concussion, and the higher the FA, the greater the likelihood of having fewer post-concussion symptoms and a better health-related quality of life a year after the injury (4).

It is important to realize that symptom resolution is not necessarily injury resolution. It is difficult to determine whether a brain is injured after the symptoms of a concussion have disappeared. Neuropsychological tests offer some good insight, however, there is no gold standard for assessing recovery from a concussion.

Resting State Functional MRI

Slobounov, et, al., utilized Resting State Functional MRI (rsfMRI) to study brain patterns in athletes who had suffered a concussion. Their findings demonstrated that in contrast to performing normally on neuropsychological tests, injured athletes had not fully healed ten days after the concussion. The rsfMRI brain scans revealed altered patterns of brain activity in the athletes who had suffered a concussion. Much of the activity representing the strength of connections between the left and right halves of the brain was lower, or weaker, than in the uninjured athletes. Interestingly they found improvement of these findings after administering mild exercises. The athletes' brains were scanned a second time, immediately after administering mild exercise tests. It was surmised that the exercise tests strengthened connections between the left and right halves of the brain. These results suggest that treating concussed patients with certain mild exercises may need to be further studied (5).

Traumatic brain injury is more serious than mTBI, and often results in permanent or longer term temporary impairment of cognitive, physical, and psychosocial functions. With TBI, radiographic findings are often demonstrable as contusions, frank bleeds, fractures, or others.

Coup and Contrecoup Injuries

Closed head injuries resulting in cerebral contusions can be generally classified as either a coup or contrecoup injury. In head injury, a coup injury occurs under the site of impact with an object. This occurs when a moving object impacts the stationary head. A contrecoup injury occurs on the side opposite the area that was impacted, and as such, contrecoup injuries are produced when the moving head strikes a stationary object. Both coup and contrecoup injuries are associated with cerebral contusion. Coup and contrecoup injuries can occur individually or together, and these injuries are considered focal rather than diffuse.

Subdural Hematoma

Subdural hematomas are usually the result of a serious head trauma; however, subdural hematomas can also occur after a very minor head injury, especially in the elderly. These may go unnoticed for many days to weeks, so it is important to monitor for any signs and symptoms. An acute subdural hematoma should be considered whenever the patient has experienced moderately severe to severe blunt head trauma. Following a closed head injury, and in the absence of positive radiographic findings, the possibility of a subdural hematoma should still be considered. A subacute subdural hematoma is arbitrarily defined as those that present between 4 and 21 days after injury. Chronic subdural hematomas are arbitrarily defined as those hematomas presenting 21 days or more after injury. Of patients who have sustained head

(Continued on Page 20)

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injury, 25% developed symptoms after 1-4 weeks, and another 25% experience symptoms from 5 weeks to 3 months before their hospital admission (6).

Patient who are at greater risk for developing a subdural hematoma following a closed head injury include patients such as those who take anticoagulant medications; have long-term abuse of alcohol; have a history of recurrent falls; have a history of repeated head injury; are very young or very old. Some of the signs and symptoms of a subdural hematoma include:

Signs and Symptoms of Subdural Hematoma

- Headache following a closed head injury
- Confused speech
- Cognitive dysfunction
- Balance and Gait disturbances
- Lethargy or confusion
- Loss of consciousness
- Personality changes
- Motor deficit
- Nausea and vomiting
- Numbness
- Seizures
- Slurred speech
- Visual disturbances
- Weakness

Epidural Hematoma

An Epidural Hematoma is more serious than a subdural hematoma. Epidural hematomas are resultant of Traumatic Brain Injury and are generally associated with a skull fracture. They are potentially fatal due to the buildup of blood increasing pressure within the intracranial space compressing brain tissue and causing a brain shift. Epidural hematomas occur in about 1-3% of all head injuries, and about 20% of epidural hematomas are fatal.

Summary

Headaches are a common occurrence following motor vehicle accidents. Most are typically benign and can be effectively treated. Some, however, can be a sign of a more serious issue. Closed head injuries more often lead to Mild Traumatic Brain Injuries and Traumatic Brain Injuries, resulting in contusions, bleeds, and occasionally fatalities. Both mTBI and TBI have the potential for more serious outcomes, longer and worse sequelae, and a more prolonged recovery time. Important tools like the GCS and TBI categories can help assist in treatment prognosis, and DTI-MRI and FA have demonstrated to be valuable in demonstrating potential long term outcomes in traumatic brain injury patients.

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Author

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Smart Injury Doctors are the Most Important Doctors in the Market Today

By Jeff Cronk, DC. JD

Injuries are the number one cause of chronic pain and disability in the country today. This means that the same problem that causes acute pain causes chronic pain and, as we all know, chronic pain is at epidemic levels in this country. Any doctor today who struggles to get new patients is tantamount to a doctor in a war zone with nothing but injured soldiers everywhere, saying there is nothing to do. Work is everywhere and there simply are not enough good doctors to handle it all.

If injuries cause both acute and chronic pain then, regardless of whether you are treating active acute injuries, you are treating injuries none-the-less, and therefore have an injury practice. Let me be a little clearer. Most of the chronic pain in this country is directly related to a problem with the spine, as the lumbar spine is the number one cause of pain and disability, the neck is number four, and headaches (spine related) is the 6th leading cause. Now this sad story of pain and disability gets much worse, as 9 out of ten chronic pain sufferers do not have the actual patho-anatomical cause located. Said another way, they do not have the cause of their condition accurately identified, and that is the problem with

lack of standardized diagnosis and that is a doctor problem in this country, not a patient problem.

Is this problem of having an inability of doctors to standardly diagnose the cause of the problem expensive for the patient? The American Pain Society in their 2007 "Guidelines to the Evaluation and Management of Low Back Pain" states that "In the U.S., nonspecific mechanical low back pain is the fifth most common reason for all physician visits, and the second most common symptomatic reason..." and that "Medical treatment for chronic low back pain is estimated to cost \$9,000 to \$19,000 per patient annually." (1)

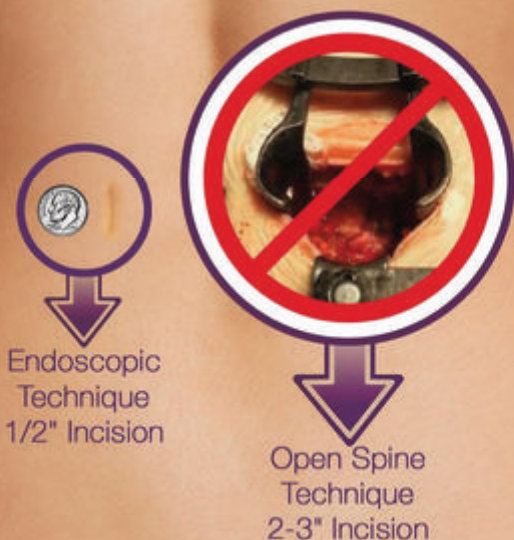
In the work-related injury arena this is commonly understood, "Back Injuries and Lower Back Pain (LBP), continue to be the number one business loss. Many calculators today place a \$50,000.00 price tag on just one back injury, however the total cost generally adds up to \$275,000.00 or more, over a three-year period." (2)

As you can see, if the most common diagnosis (Non-Specific Mechanical Low Back Pain) is really not a diagnosis—this is the problem---and yes, it is incredibly expensive for the patient public.

Now in chiropractic, we have the exact same problem and we need to acknowledge and correct the problem so that we can take the lead in this area instead of maintaining our professional and economic slide from less than half of one percent of the health care market to our projected one third of one percent by 2020.

For those that do not believe that in chiropractic we have the same inability to standardly diagnose the problem with the patient, just send the same Low back pain patient into 20 different chiropractic offices and look at the workup and the diagnosis that the patient walks out with. You will no longer wonder if we really have this problem as it will be apparent.

If you knew you had a choice,
which surgery would you choose?



So, if all this chronic pain and disability is related to a spinal injury, then what is the problem with the spine, what is the injury, what does it look like and how do we standardly work it up?

Simple...but before I tell you I want to now explain the relevance of title of this article. If injury to the spine in the number one cause of pain and disability, then the answer is right there. The injury! A smart injury doctor is simply a doctor that understands how to standardly diagnose the injury, successfully treat the injury, and document in a way that allows all parties to easily determine the proper patient benefits that the patient may be entitled to.

These same spinal injuries (derangements) cause both the acute and the chronic pain that so many patients today need help with. The most common injury is called a spinal instability, which is excessive spinal motion caused by an injury (damage) to the spinal ligaments and this now excessive motion causes a motor, sensory or a pain problem at that level.

This is very easy to standardly diagnose, and, in the process, you can even accurately grade the severity and location of the spinal sprain. This can easily and standardly be done provider to provider.

Here is our problem today, a patient comes in with an injury to the neck from an auto collision. We say she sprained her neck (ligament injury to the neck), which is very general as it does not tell you where in injury is and how bad is it. To a smart injury doctor this it tantamount to a lower extremity specialist saying that the patient's leg injury is a sprained leg. That would sound unprofessional, wouldn't it? You would want to know where in the leg is the ligament damage, which joints are affected, and how severely. Yet that is what we, as a profession, do everyday and, at the same time, we are asking to be acknowledged as high value professionals in the market.

Smart injury doctors will be the doctors that lead the way to standardized procedures in the profession of chiropractic, so we can stop the dwindling economic slide that our profession has endured for too many decades now.

Dr. Cronk is the developer of the SmartInjuryDoctors™ and the SmartinjuryLawyers™ which can be found at www.smartinjuryeducation.com. He can also be reached at Spinal Kinetics at 877-508-9729 or www.thespinalkinetics.com

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2018 schedule

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[Jun 23-24](#) MOD IX: Concussions and Cranial Nerve Exam for Motor Vehicle Injuries

[Aug 25-26](#) MOD VII: Case Management for Motor Vehicle Injuries

[Sept 29-30](#) MOD V: Documentation for Motor Vehicle Injuries

[Dec 1-2](#) MOD III: Outcomes Assessment Tools for Motor Vehicle Injuries

LA

[April 7-8](#) MOD II: Medical Legal Issues for Motor Vehicle Injuries

[May 5-6](#) MOD IV: Radiology for Motor Vehicle Injuries

[Sep 22-23](#) MOD VI: Spinal Examination for Motor Vehicle Injuries

[Oct 27-28](#) MOD X: Whole Person Permanent Impairment Rating for Motor Vehicle Injuries

San Diego

[Jul 28-29](#) MOD VII: Extremity Examination for Motor Vehicle Injuries

[Oct 13-14](#) MOD I: Spinal Ligament Injury in Motor Vehicle Injuries

Chicago 2018 Schedule

Jun 16-17 MOD X: Whole Person Permanent Impairment Rating for Motor Vehicle Injuries

[Aug 18-19](#) MOD IV: Radiology for Motor Vehicle Injuries

Davenport 2018 Schedule

[Sept 15-16](#) MOD III: Outcomes Assessment Tools for Motor Vehicle Injuries

[Oct 6-7](#) MOD I: Spinal Ligament Injury for Motor Vehicle Injuries

[Nov 3-4](#) MOD V: Documentation for Motor Vehicle Injuries

[Dec 8-9](#) MOD IV: Radiology for Motor Vehicle Injuries

Phoenix 2018 Schedule

[Jan 20-21](#) MOD III: Outcomes Assessment Tools for Motor Vehicle Injuries

[Feb 24-25](#) MOD II: Medical Legal Issues in Motor Vehicle Injuries

[Mar 24-25](#) MOD VI: Spinal Exam for Motor Vehicle Injuries

[April 21-22](#) MOD IV: Radiology for Motor Vehicle Injuries

[June 9-10](#) MOD V: Documentation for Motor Vehicle Injuries

[July 14-15](#) MOD I: Spinal Ligament Injury in Motor Vehicle Injuries

[Aug 11-12](#) MOD VII: Extremity Examination for Motor Vehicle Injuries

[Sept 8-9](#) MOD VIII: Case Management for Motor Vehicle Injuries

[Oct 20-21](#) MOD IX: Concussions and Cranial Nerve Exam for Motor Vehicle Injuries

[Nov 10-11](#) MOD X: Whole Person Permanent Impairment Rating for Motor Vehicle Injuries

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Questions on a Potential Lawsuit

by Patrick Hogan

There is a potential lawsuit involving an auto accident. The other side claims he had 10 fractured ribs on the left, fractured left shoulder, right leg behind the knee injury. His attorney said his medical bill was over \$400,000. I don't think it is out of pocket expense. He is 74 years old and should be covered under Medicare and possibly private medical insurance. How do you determine the damage they can go after? Is it non-reimbursed bill he paid out of pocket or reimbursable expenses by medical insurance company? He didn't provide any medical bills to my insurance company yet. If he had the above injuries, how much approximately can they go after? What type of documents does he need to provide to prove his injuries?

The time when an accurate evaluation of damages can be made always varies with the nature of the case. (i.e. short-term injuries are more readily evaluated for damage purposes than disabling injuries.) However, usually a general evaluation can be made at the initial client interview (from claimant's account of injuries sustained, review of medical expenses incurred to date, etc.); thereafter, the task is one of refining the evaluation ... through fact gathering and analysis of the applicable law. The initial damage evaluation should never be the last. Injuries which appear to be minor often develop into a major physical detriment with long-term effect; in such event, the value of the claim will be much greater than that determined from the initial evaluation. Accordingly, in each case, the damage evaluation should be ongoing; reevaluation will usually be needed on a quarterly, or similar periodic basis. Also keep in mind that the "value" of plaintiff's claim ultimately depends on evidence to support it. Plaintiff's naked assertions as to pain and suffering, medical expenses, loss of earnings and earning capacity, etc. will have little effect on an insurance claims representative or jury without corroborative proof. When evaluating plaintiff's claim, the adverse party's insurance representative, his or her attorney, and ultimately the judge or jury tend to give great weight to medical bills incurred. Hence, the full value of the claim which is economic damages, plus consequent pain and suffering and other general damages may be realized only if the client continues to receive *necessary* medical attention while the symptoms persist or until a competent physician advises that further care and treatment would be of no real benefit.

All insurance companies owe their insureds an implied duty of good faith and fair dealing. Should the carrier fail to honor its implied contractual obligations, e.g. unreasonable refusal to pay medical benefits under the terms of the policy; unreasonable refusal to defend; delay in negotiating reasonable settlement "without proper cause", the insured may have an independent "breach of implied covenant" cause of action against the carrier for emotional distress and other consequential damages and, in an appropriate case, even punitive damages.

Documentation of injuries is essential to recovery of damages; and procrastination in seeking necessary medical treatment can reduce the value of the claim. The items bearing on damages sustained are medical and hospital reports, medical bills, repair estimates or bills, documentation of lost earnings to date (e.g., statement from employer), documentation of all other "out of pocket" expenses incurred (e.g., car rental costs, towing charges, photographer's costs, etc.). It would be best to seek personal assistance from a lawyer in order to guide you with your personal injury claim.

PERSONAL INJURY QUARTERLY Quiz

by Martin Kollasch, D.C.

Test your knowledge of some basic personal injury topics covered during the American Academy of Motor Vehicle Injuries' curriculum by answering the following questions. There is only one correct answer.

1. During a MVC, the acceleration of the occupant of a vehicle is _____ the acceleration of the vehicle.
 - A. Always equal to
 - B. Always less than
 - C. Always greater than
 - D. Sometimes less, sometimes greater than
2. In determining the locations of possible injuries sustained in a MVC an understanding of which of these is most beneficial?
 - A. Delta-V calculations
 - B. Property damage estimates
 - C. Mechanism of injury
 - D. Differences between MRI and CT
3. Typically, upon settlement of a personal injury case, the obligation to pay the bills and satisfy any liens associated with the treatment of the injured party (plaintiff) is the sole responsibility of the _____.
 - A. The defendant
 - B. The defendant's insurance company
 - C. Injured party (plaintiff)
 - D. Injured party's (plaintiff's) attorney
4. For a 78-year-old MVC victim, which of these potential insurance reimbursement methods is the one of "last resort"?
 - A. Uninsured motorist
 - B. Underinsured motorist
 - C. Medicare
 - D. Homeowners'
5. Which of these is NOT a component of calculating Delta-V?
 - A. Absolute speed of each vehicle
 - B. Relative speed of the vehicles
 - C. Occupant position in the vehicle
 - D. Collision impact configuration
6. Delta-V as a calculation of the _____ as a result of the crash.
 - A. vehicle devaluation
 - B. vehicular damage repair cost
 - C. velocity change
 - D. victim's compensation value
7. A 67-year-old female presents for evaluation and treatment of injuries sustained in a MVA in which she was the driver of a vehicle going approximately 35 MPH when it struck the side of a cement mixer truck. She was aware of the impending collision and was gripping the steering wheel with both hands at impact. Among other complaints, she reports neck pain and stiffness, and bilateral hand pain, swelling, and stiffness. Radiographic examination includes an increase of the atlanto-dental interval from 2mm in the neutral lateral projection to 5mm in flexion. Physical examination includes tenderness and soft tissue swelling of the hands with ulnar deviation of several digits bilaterally. In addition to trauma, which of these conditions is consistent with these findings and therefore needs to be evaluated as a complicating factor in developing a treatment plan and prognosis.
 - A. Paget's disease
 - B. Syringomyelia
 - C. Rheumatoid arthritis
 - D. Diabetes mellitus
8. Which of these conditions may result from traumatic injury to the pituitary gland during a MVC?
 - A. Hyperthyroidism
 - B. Metabolic syndrome
 - C. Diabetes insipidus
 - D. Paget's disease
9. Diffuse bilateral upper and lower extremity paresthesias following a MVC are most likely due to which of the following?
 - A. Occipital lobe contusion
 - B. Brachial plexus stretching
 - C. Cervical spinal cord edema
 - D. Bilateral SCM strain
10. What is the best study to confirm suspected spinal cord edema?
 - A. CT
 - B. NCV
 - C. MRI
 - D. PET

The answer to each of the questions above is C (for Chiropractic of course).

Dr. Kollasch is a Phoenix native and practices in Scottsdale. He also worked with the National Board of Chiropractic Examiners for nearly 20 years. You may contact him at (480) 948-6020 or martin.kollasch@gmail.com.



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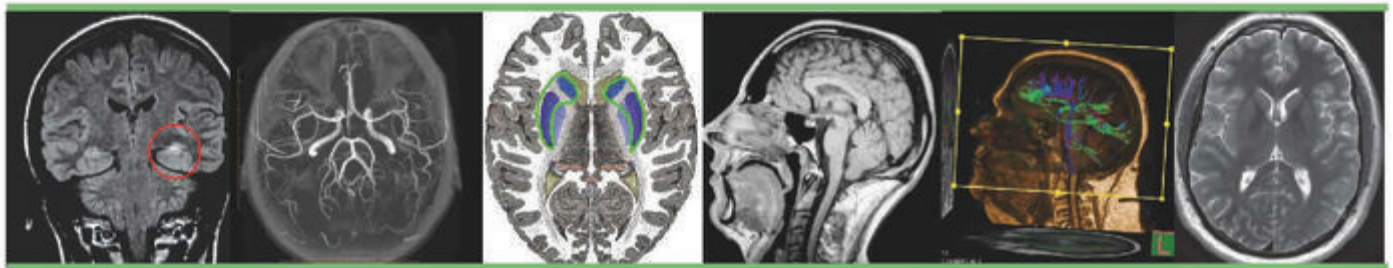
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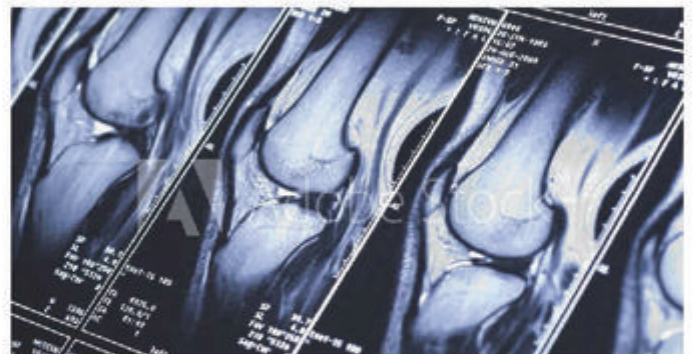
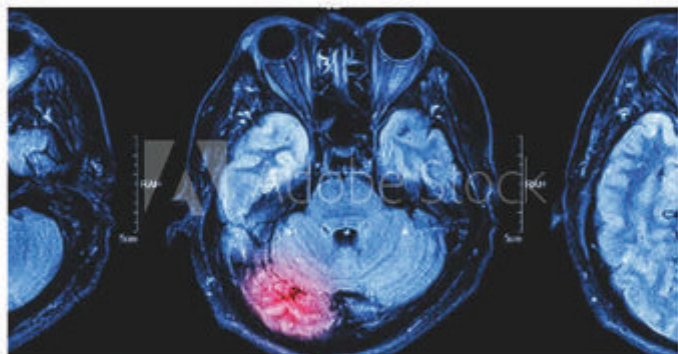
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