Whiplash Associated Disorders (WAD):

An Interventional Pain & Regenerative Medicine Approach

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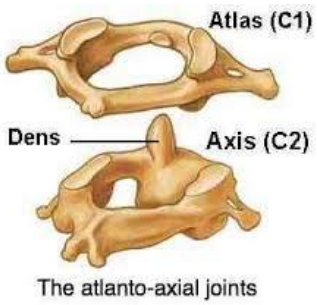
Introduction:

The socioeconomic impact of "whiplash" trauma cannot be understated. Since the 1950's when the term was first used in JAMA by Gay and Abbot[1], this term has become a household term. The term "whiplash associated disorder (WAD) was introduced in 1995 by the Quebec Task Force, who published the first systematic review on whiplash injuries[6]. This term was chosen because of the broad spectrum of disorders associated with whiplash trauma injuries.
The cost of care nationally and internationally is staggering for WAD. And worse, we really do not have studies on the prevalence of long lasting work disability associated with WAD. There are studies to suggest a significant number or individual's loose time off work. In 2002 the estimated cost of WAD in the US alone was 201 million.[1-3] In this article, we will review some of the pathophysiology of whiplash trauma because it is critical for you to have some idea about the cause of chronic pain after whiplash trauma to enable you as a more informed consumer of healthcare. Because many initially seek extensive treatment for associated injuries, one can consume a significant amount of healthcare services at significant expense, and yet find themselves having experienced very little improvement. It is helpful if the medical provider who is directing care to whiplash trauma patients has a background in the various disciplines such as chiropractic, acupuncture, massage, manual medicine, physical therapy, rehabilitative medicine, interventional pain management. Finding providers like this is somewhat of a challenge, but they are out there.

Brief anatomy review:



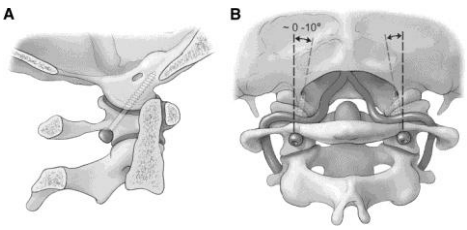
The atlanto-axial joints

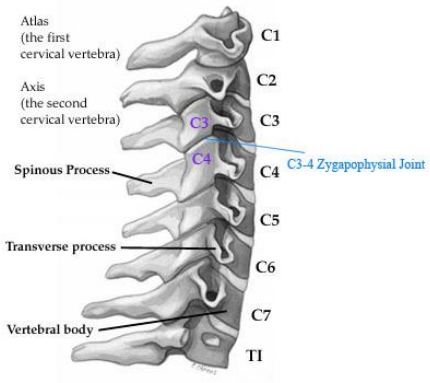
There are a few things that you need to know in regard to anatomy of the cervical spine to begin to understand how chronic pain develops, why things may not heal, and where the new technological advancements available to patients fit it. The cervical spine has some vertebra that are more typical, that is to say they have paired joints in the back portion of the spine called "facet joints" that are housed in ligaments called the "facet joint capsules". These structures are critical for you to know about and we will be referencing them frequently throughout the remainder of this paper. Other features of typical vertebra in the cervical spine have rounded

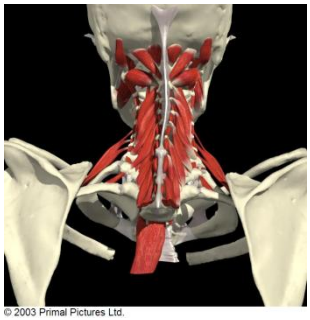
vertebral bodies and discs that set between these segments. We will write more on that arrangement later. There are also both typical and atypical vertebra found in neck. The atypical vertebra are found in the upper neck.

The atlas: Seen as the circular bone in the image above.
The axis: Seen as the vertebra with a finger like projection.
The occiput: The base of the back of your head.

One vertebra (the atlas), does not even have a vertebral body, but is a ring shaped bone that sits on a finger like process called the odontoid process as shown in the image above. This arrangement allows for better rotation around the process. For this reason, we enjoy a great deal of rotation motion at this C1 and C2 segment. The C1 segment also articulates with one of the bones of the skull called the occipital bone. The C1 "ring" (atlas) has joints on the top that join the occiput, this set of joints is designed for flexing and extending you head forward and back. The atlanto-occipital joint and atlanto-axial joint are so complex we will address injuries to this set of joints in a separate paper. In brief, there are critical ligaments and soft tissues that support this region. We will see that there are also critical muscles in this region that can be a partial source of pain. An interesting thing about these joints in the upper cervical spine is there is no disc! This is very unlike the rest of the cervical spine. The anatomy of these upper cervical spine segments is quite complex, just look at one layer of the multiple small muscles attaching to this region. All of these small muscles are capable of producing pain and when tension in the muscles is maintained they are capable of causing joint dysfunction and persistent pain.

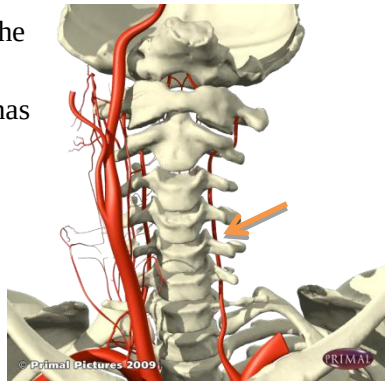


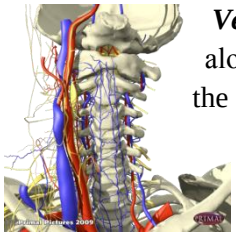




Disc: The cervical discs are anatomically dissimilar to discs in other regions of the spine. Those differences are not important for this discussion. The cervical disc has fiberous rings on the outside of the disc similar to other regions of the spine. These fibrous rings are quite pain sensitive. The disc has a mobile center that simulates beef fat, again similar to other regions of the spine. Please see the article on the annular tear on our website for further information on the anatomy and function of the disc. These discs do degenerate over time, which has a whole host of potential effects on the mechanics of the spine.

Important vessels: There are two important arteries that will be essential to our discussion of whiplash associated disorders.

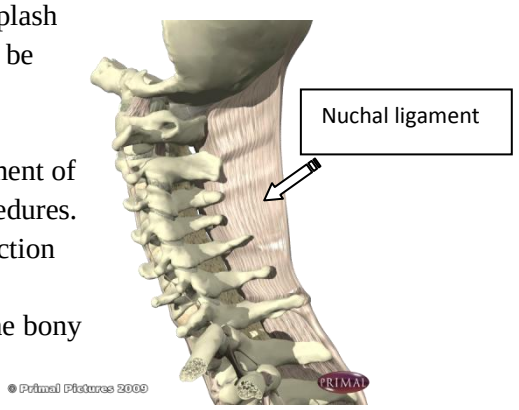




Vetebral artery – The vertebral artery travels through small holes along the "transverse processes" on the side of the spine as shown by the orange arrow to the right.

Carotid artery – The carotid artery travels from a large vessel at the base of the neck and extends up into the brain. It divides into two large branches.

The internal carotid enters the base of the skull and is a major supplier of the brain's blood supply. There are important nerves that literally wrap around this artery and make their way into the brain. These nerves are the sympathetic nerves and the nerves can be stretched in some patients during whip lash injury leading to one of the associated whiplash disorders called Barre' Lou syndrome. This is not common and will be discussed briefly later in this article.



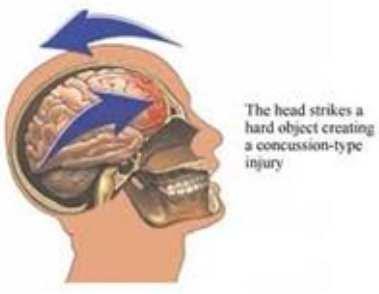
Ligaments: interspinous, supraspinous, fascia, muscles.

The ligaments that support and control motion of the joints, as well as alignment of the spinal segments, are key to our discussion of regenerative medicine procedures. It is these structures that are our primary target when doing regenerative injection procedures.

Notice for example, there are broad fan shaped ligaments between the bony prominences of the spine (spinous processes). These ligaments (supraspinous ligament, interspinous ligament, nuchal ligament) can be stretched and torn in whiplash trauma rendering them incompetent in supporting spinal segmental stability.

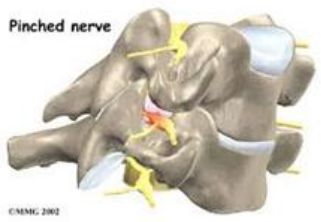
The Capsular ligaments: Another very important group of ligaments in the cervical spine is the ligamentous around each of the cervical facet joints. In my opinion these are the most commonly injured ligaments in whiplash associated trauma, and are an important source of chronic pain. Each of the cervical facet joints and the supportive capsular ligaments have a specific referred pain pattern. For example as shown in the picture to the right the C5-C6 facet joint refers its pain across the shoulder whereas the C6-C7 cervical facet joint refers its pain between and over the shoulder blade. The cervical capsular ligaments that support the cervical facet joints can be sprained leading to subtle segmental instability, which can then lead to chronic segmental pain, referred pain and secondary muscle pain and tension which we will describe later in this article. It is also important to understand that it is typically not just a single joint that is injured in a whiplash trauma, but multiple joints often extending through the entire cervical spine. This is a critical concept when planning for therapeutic interventions for chronic pain associated with whiplash injury. The target of many of our interventions for whiplash trauma involves these ligaments. In fact, manipulative therapy utilized by physical therapist, chiropractors and osteopaths also involves the restoration of mobility of these joints supported by the capsular ligaments. When these ligaments are sprained and instability develops, patients may not respond as expected to manipulation and physical therapy. We will be referring to these ligaments later when we address regenerative therapies that are utilized to regenerate and restore the strength of these ligaments after injury.

Cervicogenic headaches: It is common place for patients with whiplash associated injuries to experience headaches. There are numerous muscles, ligaments, soft tissues, and nerves that can be irritated following soft tissue injuries that can refer pain into the head and cause headaches. For example, the sternocleidomastoid muscle shown in the picture to the right causes pain that can radiate over the eye, the ear and the side of the face. This is in fact a common distribution of headaches experienced by patients who experience headaches after whiplash trauma. There are many more muscles and soft tissues that can refer pain into the head, and a physician who is treating whiplash trauma patients needs to have a detailed knowledge of all of these referred pain patterns in order to target appropriate treatment.

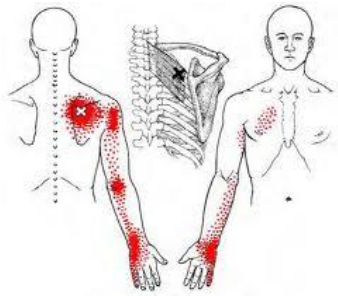


Post concessional headaches and closed head injury in WAD: Concussions are another common phenomenon associated with whiplash trauma. There are several mechanisms by which concussions can occur. One of them is simply called a contrecoup concussion, where brain moves forward and back within the cranial vault during whiplash motion.[4] Regardless of the mechanism of concussion, the important concept is that concussions do occur and there are a myriad of problems associated with them. One of these problems is associated headaches. It is important for a physician treating whiplash associated disorders to recognize the difference between patients having post-concussion headaches and headaches that are referred into the head from the neck and soft tissue injury. Surprisingly, many of the symptoms following head injury are associated with mild, rather than severe head injuries. In many cases, the incidence of headaches is rather high in those without loss of consciousness or post traumatic amnesia.[5] Little anatomical evidence exists to explain this phenomenon. However, impact forces are considerable even in low speed auto accidents. Patients may also experience post-traumatic migraines, although this is much more rare.[6]

Clinical features of post-traumatic migraines are for the most part identical to patients with normal migraines. These patients often have pre-existing history of migraine headaches that pre-date the trauma. This genetic pre-disposition is a potential set up for this type of headache. Trauma to the head or neck may trigger the migraine process in a susceptible individual.[7] Post-traumatic headaches and post-concussional headaches are treated differently than headaches that are derived from the muscles and ligaments of the neck. Therefore, I do spend time with patients sorting out the exact cause. Patients with post-concussion syndrome may also complain of dizziness, sleeping difficulties, change in mood, or cognitive problems such as memory, concentration, and thinking. On occasion, for those patients who I suspect having a post-concussional syndrome, I coordinate care with a neuropsychologist for purpose of neuropsychological testing. This is a comprehensive examination process that I will not cover in the content of this article, but will discuss with my individual patients who I think require such an extensive evaluation.

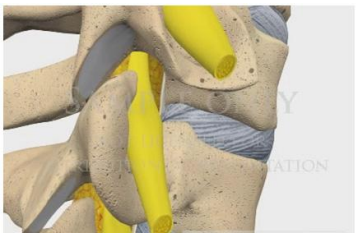


Radiculopathy: There are times when someone exposed to whiplash trauma aggravates pre-existing degenerative changes as we have described below, or may cause a disc protrusion that can irritate a nerve. Inflammation and pressure on the nerve can cause pain radiation into the arm. We term that phenomenon a radiculopathy. This may be associated with numbness and weakness in the muscles in which that nerve serves.



It may be interesting for you to know that the majority of people who are exposed to whiplash trauma and complain of numbness and generalized weakness in the upper extremity along with pain in the arm, in fact probably do not have atrial radiculopathy. Many of these patients have pain that radiates into the shoulder or arm because of other soft tissues that are injured. Remember, previously we demonstrated the referred pain pattern for typical facet pain. There are also patterns of pain that can extend into the upper extremities from the cervical facet joints. In addition, many of the muscles around the shoulder blade and neck can also refer pain into the arm. For example, the pain pattern noted to the right stems from pain derived from the rhomboid muscle causing pain referral down the arm as noted in the picture. It is common place when physicians are not well versed in all of the referred pain patterns of soft tissues, to mistake pain coming from soft tissues for pain that is caused by a nerve. Many well intended pain physicians perform epidural injections and other corticosteroid injections directed towards the nerve, when in fact one does not have true radiculopathy. This typically results in slight improvement or potentially failed response rather than a dramatic improvement in pain.

Trauma to pre-existing degenerative disc and joint disease: Most of us by age 30, and sometimes before 30 have underlying degeneration of our cervical disks and the joints in our neck. It is a fact of life. It is common place for patients to become quite surprised when we review an MRI study of the neck and report to them the amount of degeneration they have. Many patients respond defensively stating "I never had a problem before" which is really a statement made in ignorance. You do not have an injury today followed by rapid degeneration that can manifest itself weeks after an injury. Many individuals have pre-existing degeneration, some which has given an individual trouble before, and some pateints have never had pain or problems from the degeneration before. The degeneration however, increases susceptibility to injury, and makes the injury much more complex. In the pictures to the right the top picture shows a normal cervical vertebra with no degeneration. The bottom picture shows a vertebra with a degenerated disc in which you can see the disc has lost its normal height. Each patient's specific pattern of degeneration is unique and the consequences of this degeneration are varied. We will discuss all of the details of your specific condition and whether or not the degeneration that you have is an important issue or not.



Trauma superimposed in pre-existing pathology, previous injury and pain: One of the biggest problems we run into when evaluating a new patient following cervical spine injury is whether or not they

have had previous injuries; most importantly, neck pain and pathology that was present prior to the accident they are now being evaluated for. It is not uncommon for a patient that has been referred to us to have years of previous chronic pain and extensive treatment for neck pain that pre-dates the current date of injury. Some patients may have had this pain resolve with treatment and some patients have continued to experience chronic pain even to the date up to the accident in current question, it critically important that your physician understands the complex history that pre-dates a specific accident. Important decisions are made based on this history, which include diagnostic imaging, diagnostic workups and even specific methods of treatment that may be implemented because of this complex history. Chronic pain or previous injuries make an individual vulnerable for aggravation to pre-existing injury, so it is critically important that your doctor knows exactly what was present prior to your injury. This is why I take so much time in a patient's initial consultation in order to document everything that may have pre-existed the injury. Those of you who are patients of mine know I always ask if you have ever had any previous motor vehicle accidents, work-related injuries, or other accidents or injuries in your past. I always ask if you have had previous same or similar complaints such as neck pain, arm pain, headaches, etc. I also request that you tell me if you have ever had previous chiropractic or physical therapy. These questions and others like them will always be asked in my interview with every patient. I expect an honest answer. Previous treatment, medical records, hospital records, emergency room records, physical therapy records, diagnostic imaging all are easily obtained when you are involved in an accident. If you have filed a lawsuit or are in the process of filing a lawsuit against an individual who has injured you, their attorneys and insurance companies attorneys have a right to all of that information, and you give up that right for your "protective information" when a lawsuit is involved. So the HIPPA laws that protect your privacy are no longer in place and they have the right to discovery. The patient should not be naïve enough to think that attorneys and insurance companies do not have the resources to find this information.

Individuals with pre-existing problems are often afraid to admit that they have had extensive problems in the past. These patients often justify their non-disclosure of this information stating to themselves "I never had pain like this before". This is something that I hear quite frequently, but this is not for a patient to decide. If you are asked questions about your past it is important that your physician understand what you have had in your past. I must understand exactly what the pre-existing condition was; it is the only way that I can defend a patient and make a determination of what contribution a specific injury has had to their pre-existing condition. The last thing you want from me as an expert witness representing you is to find out that you have lied to me when I get to a deposition, hearing or worse yet, on the witness stand in court. I will never forget the first time this happened to me; I had to find out by cross examination in court by the defense attorneys, who had stacks of records about a patient's previous injury and treatment that I had no knowledge of. If I am met with such a surprise, it will make some dramatic changes in my ability to support a patient and any support for injuries that we have stated you have had. It changed everything when I found out that a patient lied to me when I interviewed them initially, it always ends badly. Therefore, typically when I meet an attorney for a pre-deposition or pretrial conference the first question I asked is "are there any surprises that I need to know about?"

Honesty is the best policy: Honesty is truly the best policy. The only way that a physician and your legal team can defend you as an individual injured in

an accident is to know what pre-existing conditions you have. It is only fair to the system that we make the individual who injured you responsible only for that which they have caused. So when you are asked about previous existing conditions, treatment, etc. honesty is the best policy. Do not be so naïve to assume that your records and prior history is not accessible to everyone.

Physical medicine in whiplash associated disorders (WAD): Physical medicine such as chiropractic and osteopathic manipulation, physical therapy, massage, exercise and a host of other treatments are commonly used in injuries involving whiplash trauma and whiplash associated disorders. Each of these disciplines can play a very important role in the treatment of whiplash injury. As a physician board certified in physical medicine, I often coordinate care within these various disciplines to optimize patient recovery. It is also important for a "team leader" to know when an individual has maximized their potential benefit from any one or all of these treatment procedures. There are times when an "integrated approach" in which we integrate sophisticated methods of treatment with your physical therapy and manual therapy, is most valuable. It is often then and only then that the patient can achieve their therapeutic goals. A patient seeking a chiropractic provider for example who continues for months and months without significant benefit is burning up their valuable economic resources available for treatment. You have to realize that you have a specific dollar value that you have available after an injury for treatment, if you burn through those resources with ineffective treatment, it often traps you into not being able to receive advanced medical care that would have otherwise been available to you. Time and time again I see this happen to patients involved in personal injury claims. They go to a specific provider, are treated for 8-12 months and suddenly when their insurance funds available for treatment run out, the provider concludes that there is nothing more they can do for you. You must be an informed consumer in the healthcare system. Therefore, when you are not getting resolution to symptoms, you need to start asking questions. If your questions are not adequately answered and you are not referred to medical specialists to help coordinate your care, more than likely you need to discontinue that care and find a practitioner that can help you sort through what to do next. Do not continue ineffective care. The insurance money that is available for you is like a savings account, when it is gone, it's gone.

It is not uncommon for patients to have gone through 8-10 months of chiropractic treatment, burned through all of their insurance funds and then, when there is no longer any money, seek care elsewhere. Many of these patients are underinsured or not insured other than their auto insurance policy. They present with a torn meniscus in the knee or some other type of condition that may require surgery and at this point do not have access to surgeons that I would typically refer them to. Many of the better surgeons simply do not take "third-party" cases. A third part case means the provider will have to wait to be paid on some type of settlement claim. Please use the money that is made available for you wisely.

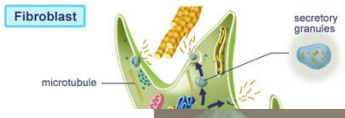
Traditional pain management approaches: the revolving door: Many patients with persistent symptoms and chronic pain following an injury may be referred to pain management physicians. Traditional approaches to pain management are often what we call "evidence-based approaches". Traditional approaches may often be based on the results of randomized clinical control trials, where a group of patients has undergone participation in a clinical study in

which the patients who did not receive the placebo treatment had a specific or statistically significant improvement. Pain physicians typically initially utilize injection therapies in patients with cervical whiplash trauma. These therapies may be cervical epidural injections, selective nerve root blocks, or corticosteroid injections directed to the facet joints. Unfortunately, some pain physicians may indiscriminately utilize a series of epidural injections for a pain presentation after injury that may not involve radiculopathy or pain arising from the nerve roots. The patient may present with constant neck pain and only occasional arm pain and still they receive a series of epidural injections and then wonder why they did not get better. It is because the epidural block is effective for patients with a certain type of pain stemming from a very specific cause. Epidural injections cannot be given indiscriminately. After a few epidural injections the patient may then undergo cervical facet injections with corticosteroid. The first injection may help, which means that it was in fact the cervical facet joints that were probably the source of your pain to begin with. If you do gain temporary symptomatic relief from the cervical spine facet injections, which you most likely will since they are the most common source of the pain, what do you do when the pain does not get better? Corticosteroids do not resolve or heal any injuries. Therefore, the only other tool to resolve pain stemming from the facet joints is to use a radiofrequency thermal energy to kill the nerve that innervates the facet joint. Physicians trained in spine and pain medicine are technical experts and are quite capable of placing a local anesthetic by injection under x-ray on the nerve that innervates the joint. If they block that nerve and you gain relief from that block the only other alternative they have in their "toolbox" is to use radiofrequency to ablate the nerve. This will, often result in pain relief, at least for a period of time. The problem is that nerves regenerate and the pain returns. A patient undergoing such a procedure can expect to have the pain return within 6-9 months.

So what do you do then? Typically the physician repeats the procedure. However, the nerve regenerates again and you are caught in a revolving door. After several of these procedures the nerves regenerate from other locations, therefore the regeneration is so complex that there is a lot of diminishing return with each procedure until eventually it is no longer effective. The next thing the patient knows, they are taking chronic opioid medications and have a medicine cabinet full of pills which include muscle relaxants, anti-inflammatory medications, antidepressants, sleep medications, opioid medications, and a host of other remedies.

Regenerative medicine approaches to whiplash associated disorders: The scenario mentioned above utilizing nerve ablation techniques is something that I have done myself. Today, I have for the most part abandoned these procedures and now take a "regenerative approach" to repair a soft tissue and whiplash injury. Remember, when we started this discussion we began with some specific anatomy and discussed the ligaments that support the cervical facet joints and cervical spine. Ligaments are made of collagen and other complex proteins. Would you be interested to know that there are actually forms of treatment that can be directed by injection to ligaments and connective tissues to support the spine that help lay down new collagen and strengthen ligaments? Treatment directed to ligaments help stabilize the subtle instabilities that are at the root of the chronic sprain problem. Over the last 25 years I have treated many thousands of patients that have developed chronic neck pain following whiplash injury that failed to respond to conservative means, corticosteroid injections, etc. The oldest form of these techniques is a method of treatment called RIT (regenerative injection therapy) or prolotherapy. Over the years, regenerative injection therapies have advanced and there are now numerous methods that are currently

available to help resolve chronic sprain injuries and ligaments. For example we can use a cell contained in your blood called a platelet, to promote healing of ligament and soft tissue injuries. It turns out that platelets contain growth factors that provide a powerful stimulus for tissue healing and regeneration. It is your platelets that are often responsible for initiating a healing cascade in soft tissue injuries such as abrasions and lacerations.

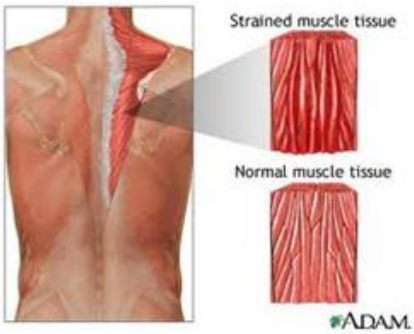


These growth factors include TGF-β, platelet derived growth factor (IGF), vascular endothelial growth factors (VEGF), epidermal growth factor (EGF) and fibroblastic growth factor -2 (FGF-2), which have the potential to enhance healing, grafting and connective tissue repair. The specific attributes of these growth factors are not as important as the basic understanding that these growth factors can dramatically influence the way connective tissues heal and proliferate. The use of these growth factors to influence regulatory function for healing has sparked significant interest in orthopedics.[8] When we inject platelet rich plasma onto injured ligaments, these growth factors stimulate a cell called a "fibroblast". Fibroblasts, now stimulated by the growth factors begin to lay down collagen and connective tissue that promote healing and restoration of ligament strength.

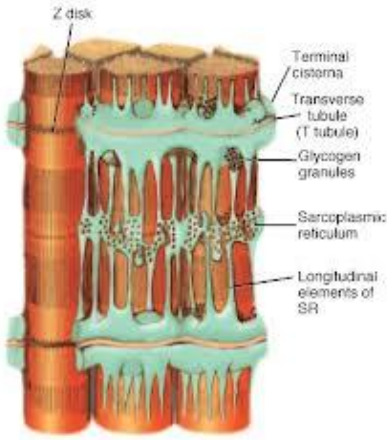
Over the years there have been many advances made in regenerative therapy that are used today to help heal and resolve soft tissue injury. I have an article on this website that discusses some of those methods in more detail and I advise you to read that article if you have interest in these methods.

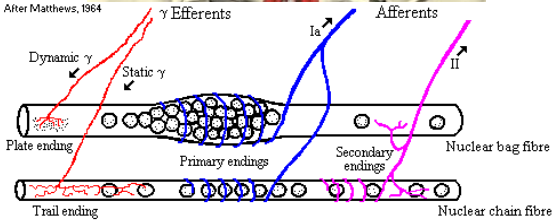
Advanced diagnostics: Patients who are subject to whiplash trauma frequently have multiple injuries that are not just limited to the neck but can extend into the mid back, lower back and pelvis and may even involve the extremities such as shoulders, etc. The key to making regenerative medicine techniques work is precision diagnosis. The slogan "advanced diagnostics - definitive therapeutics" in fact has a significant meaning. Many patients undergo various forms of treatment without a real definitive diagnosis. Even patients that undergo multiple injection therapy such as epidural, etc. often are treated without a definitive or specific diagnosis. Is it any wonder why these patients do not respond? We work from the premise that the more specific we can be in diagnosis, by isolating specific ligaments, joints and soft tissues, the more specific we can be in directing a therapeutic approach. Therefore, there are times when we take our patients exposed to these types of injuries and do advanced diagnostic blocks utilizing ultrasonography, fluoroscopy x-ray guided procedures, etc. to identify the specific source of the patient's pain. Once the precision diagnosis is made we will then create a therapeutic interventional plan, preferably using a regenerative medicine procedure to help with the best of our ability promote injury resolution.

Myofascial pain in WAD: Pain arising from the muscles and connective tissue supporting muscles is one of the most common complaints in post whiplash trauma. Initial pain is often secondary to rapid stretch injury. Interesting enough, soft tissue damage created by rapid stretch injury heals relatively rapidly, yet, all too often the pain persists. There are numerous reasons for this. We have already discussed that during whiplash, ligaments of the facet joints are sprained, and sprained ligaments cause reflex muscle spasm and secondary pain. The muscles can also be a source of pain. Muscle fiber anatomy is rather complex. Muscle is a contractile tissue made of complex filaments that slide over each other during contraction. Each muscle fiber has many of these filaments. Muscle fibers are bound into groups which are bound together by connective tissue envelopes as shown in the picture to the right. Classically, we consider a muscle strain as

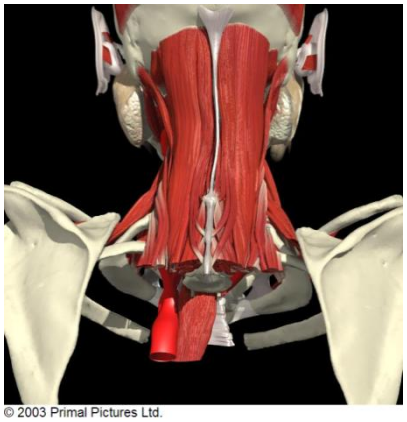


a tear of tissue in which swelling and inflammation is present, as depicted by the artist's condition of a strained trapezius muscle in the picture to the right. The interesting thing about this concept is that this is typically not exactly the case, especially in lower speed motor vehicle collisions. If you take an individual who has recently undergone a whiplash trauma and do a tissue biopsy, overall you will not see microscopic evidence of muscle tearing. Then why, does a muscle experience pain and spasm after injury, when there is no evidence of tearing of the muscle? The answer to that question is rather complicated and one has to have an understanding of how muscles contract. We are not going to get in to that much detail in this brief discussion. However, within muscle there are small membranes that are sort of like "chambers or bags" called the sarcoplasmic reticulum (seen in green in the picture to the above). These chambers contain calcium that is used for muscle contraction. When a nerve signals a muscle to contract, it stimulates these "chambers" to release calcium, which then binds to proteins on the filaments of muscles and causes them to contract together. Although a muscle may not demonstrate any outward evidence or visual evidence of muscle trauma, if you view that muscle under "electron microscopy", which is a very powerful microscope that is able to magnify well beyond standard microscope, the answer to the question is more obvious. It turns out the chambers or "sarcoplasmic reticulum" are very sensitive to stretch and they tear easily. So when you rapidly stretch a muscle you can tear the small chambers and calcium begins to spill out into the cell. Initially, you may feel some tension in your neck, but if you go to sleep and wake up the next morning and cannot move your head what has happened? Calcium that has been leaking out of the sarcoplasmic reticulum all night has caused a contraction of the whole muscle resulting in spasm.[9]





What happens next is rather interesting. There are specialized muscle cells located within the muscle called spindle cells, these cells contain special fibers that monitor the tone of muscle. It is these specialized fibers that are responsible for the reflex muscle contraction you get when the doctor taps on your knee with the reflex hammer. The special fibers constantly make adjustments in muscle tone based on tension in the muscle. If you have strained a muscle it goes into spasm for a period of a couple of weeks, even though the muscle injury itself resolves and the sarcoplasmic reticulum (chambers containing calcium) are well-healed, adaptations have been made by these muscle spindle systems. When the muscle is under spasm continuously the muscle spindles adapt and "reset". Now, when you try to relax your muscle, these muscle spindle systems tell the muscle there is not enough tone and tension. Therefore, following injury the muscle can be neurologically facilitated to maintain a contracted or shortened state and pain persists. If you place heat on the muscle, massage the muscle, do physical therapy, stretches, etc. the muscle may relax for a period of 15 or 20 minutes but then gradually the muscle tension returns because nothing has been done to reset the nervous system that is maintaining the increased tone of the muscle. Patients will find themselves frequenting chiropractors, massage therapist, and physical therapists for soft tissue mobilization just in order to obtain a short period of temporary symptomatic relief from the pain. The problem is, often the pain persists. If you have gradual improvement of this pain, then the soft tissue mobilization and procedures performed by these practitioners are beneficial they should be continued. If however, pain is persisting despite the well-intended efforts of these practitioners, there may be something that can be done that is potentially more effective. You may be asking the question, what could possibly turn off this neurologic program that maintains muscle tension? The method to do this utilizes none other than an acupuncture needle. No, we are not talking about traditional acupuncture technique but something quite different. I was first introduced to this method of treatment by a physician by the name of C. Chan Gunn, MD in Canada. He was also a professor at the University of Washington where I attended fellowship training.



Dr. Gunn called this method IMS and it is now out of respect to him, called Gunn IMS. The mechanism by which this works is rather interesting. The needles used for this procedure are rather small. In the picture to the right you can see the size of an acupuncture needle compared to a standard paperclip. The physician who is specifically trained to do this procedure will isolate and target specific muscles for this procedure. The needle is placed inside a small plastic tube because the needle is so thin it will collapse when trying to push it through the skin. The needle is inserted into the belly of the muscle, which is completely painless. The needle is then slightly turned and grabs the muscle

fibers and elicits a stretch reflex. The patient will experience a muscle contraction. That muscle contraction occurs within the section of the muscle that has been neurologically maintained to have an increased tone and when this reflex is elicited, the muscle "resets". We often stretch the muscle right after the stimulation to allow the muscle to reset. The relief of muscle tension is usually immediate. Even when the patient has not responded to traditional acupuncture they may respond to Gunn IMS. I have had years of experience utilizing this technique and can say that I am honored to have been chosen by Dr. Gunn to take over his teaching of this technique internationally in conjunction with Heather Tick, MD, a pain physician at the University of Washington.

Sleep in WAD: Sleeping difficulties are rather commonplace after injuries and motor vehicle accidents. I believe it is something that is important to address and I asked all of my patients whether or not they are having difficulty sleeping. We will not get into the details of sleeping difficulties but it will suffice to say that we do address these issues during the course of your treatment.

The victim: **Letting go of the blame is part of the healing process:**
It is not uncommon for individuals who have been injured at the hands of another to experience many emotions. Some individuals psychologically begin to take on the role of a victim and continue to remain angry and frustrated. Letting go of the blame is part of the healing process. The anxiety and stress associated with the victim role has negative psychological effects on pain, which can in fact aggravate pain complaints.

Depression & Anxiety disorders in WAD: It is not uncommon for patients with whiplash associated disorder to also have difficulties with depression and anxiety. We will address this subject in a separate paper since the complexity of the discussion is far beyond the scope of this article. We do address issues of depression and anxiety and do concomitantly treat symptoms of depression and anxiety when needed as part of the overall comprehensive rehabilitation program. We also coordinate and collaborate with other healthcare practitioners to accomplish this task if necessary.

Disability after WAD: Many individuals make the decision to go off work following an injury, and even to remain off work for an extended period of time. This decision is a slippery slope, maintaining your activity level and work activity may be more important that you realize in your recovery. Remaining off work for extended periods of time has significant physical and psychosocial effects on you and your family. Periodically, I encounter patients who are instructed to remain off work by their attorneys in an attempt to magnify the extent of injury. I would hope that if you are requested to do something like this that you refrain it. There are times when it is appropriate to remain off work, and there are times when it is important to work even though in pain. I exhort you to remain honest in regards to the extent of your abilities to work.

WAD: the polytrauma phenomenon. It is not uncommon for individuals involved in motor vehicle accidents to have multiple injuries. This "polytrauma" phenomenon is problematic to most patients who have multiple injuries. These patients find themselves somewhat frustrated because the providers that a patient sees may not be willing to deal with all of their complaints. For example, you may be seeking

care from a chiropractor who may be interested in manual therapy of your spine and your spine complaints but may not be well equipped to deal with the shoulder, knee or ankle complaints. The patient may be seeking the care of a physical therapist who is unwilling to treat multiple body parts because of the amount of time that requires, and they stay focused on one problem at a time. This is even a common phenomenon in orthopedic surgeon's practices. On many occasions I have encountered an orthopedic surgeon who specializes in shoulder or knee surgery that convinces the patient to deal with one problem at a time and allow him to proceed with a surgical intervention for a shoulder problem and ignore other musculoskeletal complaints that could be treated simultaneously. This can result in six months of postoperative recovery during which a patient is not receiving care for other injuries. Then, six months later the patient finds himself one year from the date of the initial onset without having had the majority of their injuries addressed. At a one year date following injury the patient's attorney is pressing them to settle. Therefore, it is my opinion that you need to have your care coordinated by a physician specialist who is willing to address the complexity of your presentation and all of your complaints. This may require multiple areas or multiple soft tissue injuries requiring treatment at the same time. For this reason we have always addressed the entire patient and the whole problem. It is in my opinion the only way to affect rapid recovery and desired outcome.

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