

2016 TTLA Car Wrecks Seminar

Thursday, March 3, 2016

Houston, TX

**DIAGNOSING YOUR CAR WRECK INJURIES:
WHAT DOES THIS DIAGNOSIS MEAN?**

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INTRODUCTION

There are many different kinds of injuries that occur in motor vehicle crashes. If you can think of it, it's probably happened. The purpose of this paper is to familiarize you with some of the introductory medical background and terminology associated with common motor vehicle crash injuries. It is not meant to be exhaustive, is meant to be introductory.

Sometimes medical terminology can be overwhelming. Lawyers litigating motor vehicle cases need to have some ability to understand and use the terminology in order to communicate with physicians. You should never expect the doctor to try and adopt your vocabulary. To develop your motor vehicle case to its maximum value, any attorney needs to become familiar with some pretty arcane terminology. The purpose is not to turn you into doctors, but to give you some tools to enhance the value of your motor vehicle cases.

Some of your cases will involve designated testifying expert witnesses. Every motor vehicle case also has multiple expert witnesses that are often forgotten: the treating physicians. Even without depositions, these doctors testify through their medical records. This paper will help you to understand some of the medical issues facing your clients, to help you maximize the value of your cases, and to make sure that you don't miss valuable injuries that are present but easily overlooked.

Obviously, the unspoken aspect of this paper is that you may have identifiable injuries, but not enough coverage. However in cases where you do have coverage (can you say "trucking"?) The advice presented here should enable you to enhance damages package in many of your cases.

TBI – Traumatic Brain Injury

What is it?

Traumatic brain injury (TBI) is no different than an injury to some other organ or organ system. A force is applied to the brain, which in turn causes some damage to the surrounding brain matter itself. But that's where similarity with other injuries sustained in a motor vehicle wrecks ends. In thinking about how major a brain injury is, think about the fact that we as individuals define ourselves, and other people define us, by the manner in which we interact with the environment around us. Brain injuries modify that definition. One minute your client is normal, the next minute they are different. Identifying, defining, developing and assessing those changes is your responsibility as the attorney.

It is imperative that an attorney understands one overriding aspect of the human anatomy when working up a traumatic brain injury case. The human brain essentially floats in a vat of cerebrospinal fluid. The fluid (and the brain) are contained within several membranes called the meninges. And all of this - most importantly - is contained in a hard, bony container called the cranium, commonly known as the skull. No other organ in the human body shares this kind of anatomy. All of these surrounding structures are designed to protect the brain itself. Generally, they do a pretty good job of it. In fact, defense lawyers may argue that because of these protective structures, it is unlikely your client was injured. (SLIDE 1)

Traumatic brain injury is an inclusive term. It can include everything from major disruptions of brain tissue all the way to a subtle injury that eventually gets better. While an accident reconstructionist may be necessary, some understanding of the types of injuries that occur can assist you in deciding when a formal expert analysis needs to be done.

When to suspect TBI?

The more violent the car crash is and the more force that was applied to your injured client during the wreck, the more your index of suspicion should be enhanced to look for a TBI. Sometimes it's obvious. In the emergency room, the doctors may be focused on the head and perform CT's MRIs, and other diagnostic imaging. Sometimes they may even call a neurologist to examine the patient in the emergency room or to admit the patient for a more formal neurologic workup. All of this doesn't mean your client has a TBI, but it does mean that you should be on the lookout for one. Cases involving a violent wreck ending up under medical care are the easy ones – any attorney rightfully suspects TBI under these circumstances.

However, many traumatic brain injuries occur without overt findings on imaging studies. This relates back to the way the brain is protected inside the cranial vault. The brain is basically a blob of Jell-O sitting in a bath surrounded by some plastic bags inside a hard container. There is room for the brain to move inside the cranium. The cerebrospinal fluid and meninges act as cushions. When forces are applied to the skull, the brain moves. If it did not, the forces would be transmitted directly to the brain tissue and result in a traumatic injury with much smaller force. It is the movement inside these protective structures that can lead to subtle structural injuries that qualify as TBI even though all of the scans may be within normal limits.

Types of TBI

Easy Ones

1. Skull Fractures

The easiest brain injuries to note occur with skull fractures and penetrating injuries. Because the skull is a bone and, like all bones, shows up on x-rays very well, these are easy for any attorney to recognize. When enough force is applied to the skull to cause a fracture, damage to the underlying soft tissue of the brain may reasonably be imputed, despite normal radiologic scanning. Lawyers should remember that CT's and MRIs look at structure, not function. All lawyers should also remember that it is the function element that makes us who we are as human beings and individuals.

Generally, the follow-up in patients with penetrating skull injuries and skull fractures is pretty easy to understand. You will see all of that in the patient's charts. One exception, however, may be the non-depressed skull fracture. This occurs when there is a crack in the bone but no displacement of the bony surface of the cranium – this will look like a fracture in the bone with no movement of the bones themselves. This can occur with or without overt brain injuries, but a lawyer should have a very high index of suspicion for a TBI when there is a non-displaced skull fracture as it is an indicator of a very large force having been applied to the head. The skull is pretty thick and is generally pretty difficult to break. If you see a crack in the skull, underlying TBI may be almost universally presumed, regardless of what imaging studies show.

2. Subdural Hematomas (Veins) (SLIDE 2)

Subdural hematomas occur when there is bleeding underneath the dura, which is the tough outermost membrane surrounding both the brain and the spinal cord. Subdural hematomas can be acute or chronic. The key to understanding them is to know that this is venous bleeding, or bleeding coming from a vein. It occurs at a relatively low pressure. Any force applied to the skull which allows the brain to “bounce around” can apply a shearing force to very small veins on the surface of the brain. These can be torn and bleed into the space between the surface of the brain and the membranes overlying it. This in turn can create an expanding intracranial mass which can then displace the brain tissue. Attorneys need to remember that there is a finite volume available for the brain inside the cranium; there is only so much space for the brain inside the skull and any increasing mass will put pressure on the brain itself. (SLIDE 3)

The symptoms of the subdural hematoma include:

- slurred speech
- loss of consciousness or coma
- seizures
- numbness
- severe headaches
- weakness
- visual problems

Acute treatment often involves surgical drainage. The most common methodology used by neurosurgeons is called a burr hole. Basically, a hole is opened in the overlying skull and the accumulating blood is allowed to drain, thereby relieving the increase in intracranial pressure caused by the expanding subdural hematoma. (Think a horrible Grey's Anatomy episode.)

There are a couple of special aspects of subdurals that attorneys need to understand. Because subdural hematomas are low pressure bleeds from veins, they can take some time to become clinically apparent. *There is often a "lucid period" of as long as 24 hours before symptoms appear.* This is important to understand because your client may not have gone to the emergency room immediately after the wreck only to go 24-48 hours later. This is grist for the defense attorneys mill in that it is a gap in care. If you understand the physiology of a subdural hematoma, you can explain how the injury is still related to the head trauma sustained in the car wreck and why your client did not initially seek medical care.

Another special aspect is what we call contrecoup subdurals. Remember that the brain is floating in cerebrospinal fluid and can move. When there is a sudden deceleration, such as one suffered in a car wreck, the brain is initially thrown toward the direction of impact but bounces off the skull and then gets thrown backward. The brain is then injured on the side opposite of that where impact took place. This can lead to bilateral brain injuries or even an injury 180 degrees opposite from where the impact occurred. Understanding this mechanism can prevent the defense from arguing that the injury was not related to the crash. (SLIDE 4)

3. Subarachnoid Hemorrhages (Arteries) (SLIDE 3 AGAIN)

Subarachnoid hemorrhages ("SAH") are a horse of a different color. They are, like subdural hematomas, bleeding inside the skull. Both forms of bleeding can present mass effects on the brain by creating a space occupying mass. But where dural hematomas are low pressure caused by shearing of small veins, subarachnoid hemorrhages are bleeding outside the dura caused by shearing of small arteries. Arteries bleed at a much higher pressure than veins and much more rapidly. The symptoms of a subarachnoid hemorrhage are similar to subdurals, but occur much more rapidly and much more acutely. The classic signs are a "thunderclap headache" and violent nausea with vomiting. Because of the speed with which they accumulate and the high-pressure contained within, subarachnoid hemorrhages are generally surgical emergencies. Treatment involves surgical drainage, often continuous until the bleeding stops. Wide craniotomies are frequently needed to provide exposure for the neurosurgeon to treat this bleeding. Effects of subarachnoid hemorrhages can be devastating. The time course generally favors proving that the subarachnoid hemorrhage was caused by the crash.

SAH's are graded as follows:

Grade	Signs and symptoms	Survival
1	Asymptomatic or minimal headache and slight neck stiffness	70%
2	Moderate to severe headache; neck stiffness; no neurologic deficit except cranial nerve palsy	60%
3	Drowsy; minimal neurologic deficit	50%

4	Stuporous; moderate to severe hemiparesis; possibly early decerebrate rigidity and vegetative disturbances	20%
5	Deep coma; decerebrate rigidity; moribund	10%

If you have a client who had a traumatic SAH, it is likely that there will be significant neurologic deficits. Many of these cases will need a life care plan as part of the workup.

4. Intraparenchymal Bleeds

Intraparenchymal bleeds into the brain are also called intra-cerebral bleeds. The most common forms are garden-variety strokes. The underlying cause is similar to that of subarachnoid and subdural hematomas i.e. a violent force applied to the brain.

However, in comparison to subarachnoid and subdural hemoatomas, with these types of bleeds small blood vessels within the brain itself are disrupted. They bleed into the brain tissue itself. The bleeding can be diffuse or localized. When localized, it can appear as a discrete hematoma. That can also seep into the surrounding brain tissue. This gives a somewhat different result on scans. Very few significant intracranial bleeds will go unnoticed, but smaller ones may never come to the attention of doctors on an acute admission because it all depends on what part of the brain is injured. Because there is blood outside the vessels, these bleeds are usually diagnosed by doing a contrast assisted radiologic study.

5. Contusions

Think of cerebral contusions as bruises. They are part of the continuum of intracerebral bleeding. The term tends to be used to describe a nonprogressive finding. What begins as an intraparenchymal bleed secondary to trauma, when the bleeding stops is now referred to as a contusion. When large enough, even if there is not active bleeding, these can usually be diagnosed by scans. Large ones usually make themselves clinically apparent because of primary damage to brain tissue. Large ones can also present as a mass effect on the surrounding brain because blood is an irritant and usually causes the brain to swell creating a secondary mass effect, even without a discrete collection of blood.

Hard Ones

So far the injuries we have described are fairly easy to notice and diagnose because their affects are fairly devastating or because current standard testing can easily find the problems. From here on the injuries are much harder to characterize.

1. Contusion

Because of the continuum of severity, contusions are in both the easy and hard categories. Small contusions may create very subtle symptoms. In fact, since you won't find a contusion unless you specifically look for it, a situation can arise where a client has subtle symptoms which may be similar to a contusion but have no radiologic proof of the contusion. This creates a situation where you may have a treating neurologist testifying that the most likely cause of the patient's symptoms is a cerebral contusion from trauma, but a radiologist testifying that there is no radiologic evidence.

These are not mutually exclusive opinions.

2. Concussion

This is perhaps the most argued term you will come across. The defense will have you believe that unless there is loss of consciousness, you cannot have a concussion. This is simply not true. Other terms you may see are Minimal Traumatic Brain Injury (MTBI), Mild Head Injury (MHI) and Mild Brain Injury (MBI). They are all euphemisms for the same phenomenon - a violent force applied to the brain not severe enough to create any of the Section 1 injuries above. The mechanism of injury on the cellular level is unknown, but there is much literature speculating that some changes in the local physiology of brain cells takes place.

Severe concussions can be easy to diagnose clinically. Not so severe concussions are not so easy to diagnose. But they can nonetheless have significant life-changing effects on your clients.

Severe concussions often result in specific neurologic findings on a comprehensive neurologic examination. They also have some historical findings, such as loss of consciousness and persistent headache. Some amnesia is often a component. This leads to an interesting problem for the litigator. The injured client is often asked by first responders whether they lost consciousness. Many sufferers of concussion respond “no” simply because they have no memory of having lost time. This is when you want to interview witnesses to see if you can develop that the client did in fact have a period of time where he or she was not lucid. The client is often the worst one to offer testimony on that subject. As a hint, clients who you think were concussed should not testify that they did not lose consciousness. They should simply testify that they don’t know or do not remember.

Less severe concussions can still cause a multitude of long-term issues. It is no longer accepted that loss of consciousness is required to make the diagnosis of concussion. Do not be led astray by a defense lawyer that suggests that because your client doesn’t have a record of loss of consciousness they could not have been concussed. The hallmark of less severe concussions is a lack of objective, definable criteria for the diagnosis. Nonetheless, they can lead to cognitive disorders such as loss of executive function that can have devastating consequences on your client’s life.

The only reliable modality for determining whether your client has a postconcussion syndrome remains a neuropsychological examination. Do not expect your medical neurologist to be able to offer reliable testimony in this area. Aspects of the neuropsychological examination are discussed below.

3. Closed Head Injury without Concussion

Because there is a continuum of traumatic brain injury, it may be better to not use buzzwords like “concussion” and simply describe your client’s injuries as a Closed Head Injury. 12 jurors will probably have 12 different descriptions of what a concussion is. However, closed head injury is an accurate and factual description. The only difficulty may arise if your treater describes your client’s condition as “postconcussion syndrome”. There is a constellation of symptoms after head trauma such as lethargy, cognitive disorders, loss of memory, loss of executive functioning and other deficits. Again, these are commonly and fairly accurately worked up by neuropsychological testing. Do not ask your medical neurologist treater to write a letter concerning these issues. They are

generally not qualified to do so, and because their underlying framework of knowledge is to look for structural lesions, may significantly underestimate your client's damages.

Remember to point out that on occasion, the difference between posttraumatic stress disorder and postconcussion syndrome may be difficult. In terms of a damages package, it may not make a difference but you should be aware that one can mask or supplement the other. The neuropsychologist should be able to help you with this issue. Post traumatic stress disorder may allow the defense to argue that some other trauma which occurred in your client's life is resulting in the symptoms displayed, rather than the trauma of the wreck itself.

Types of Testing to Prove TBI

This section is intended to provide a brief description of the various modalities physicians use to prove or diagnose a traumatic brain injury. Often, multiple methods are used. They each have certain advantages and disadvantages.

1. X-Rays

Simple x-ray films may often contribute to the diagnosis of any injury involving bony tissues. With regard to TBI, plain films are most useful in the diagnosis of depressed skull fractures. These can usually be seen on anterior – posterior and lateral skull x-rays. When they suspect a skull fracture, radiologists will often perform a six film series with several more complex views.

2. CT Scanning

CT scanning is a type of x-ray which uses a circular framework to create an axial image through the head. By adjusting the x-ray beam, radiologists can often make significant differentiation, even in different soft tissues. A term you may come across in charts is “bone windows“. This is when a radiologist is adjusting the x-ray beam specifically to look at bony structures. CT scans are not, however, the best way to look at soft tissues like the brain.

3. MRI

Magnetic resonance imaging is a much more sensitive scan to look at the soft tissues of the brain. Third and fourth generation scanners are exceedingly accurate. When properly performed, a brain MRI is a very sensitive examination of brain structure. It can easily see many different kinds of bleeding, as well as secondary effects from bleeding such as alterations in the brain anatomy. MRI has become the gold standard in the workup of brain trauma. It is by no means exclusive, but the most commonly used and most useful for physicians.

4. SPECT

“Single positron emission computed tomography” is rarely used in trauma. It uses radionuclide to detect subtle regional perfusion differences in the brain. This type of study may be used later in the workup of the patient with head trauma, but is rarely a part of an acute trauma workup.

5. PET

Positron emission tomography is similar to SPECT scanning. However, the procedure and nuclides being used give an indication of overall tissue metabolic rate. Again, this is something you will be unlikely to see an acute trauma workup of one of your clients. You may however see it later on during a brain injured client's hospitalization.

6. Angiography

Angiograms are a special kind of x-ray where a radio opaque dye is injected into an artery and rapid sequence x-rays are performed to take pictures of the dye filled blood vessels. Because it involves cannulation and injecting into the arterial system, it is considered invasive and somewhat risky. The dyes used are also toxic to the kidney, and this toxicity often limits the usefulness of angiography.

Angiography is occasionally used in head trauma and is considered to be extremely sensitive enough to locate active bleeding. However, newer procedures combining angiography with CT and MRI have almost replaced the simple angiogram in head trauma. (This is not to say that angiograms are not useful. Coronary angiography is still used thousands of times every day. Angiography is also still commonly used in trauma of other areas of the body.)

7. CTA/MRA

Computed tomographic angiography and magnetic resonance angiography have almost replaced planar angiography in looking at head trauma. CTA still involves putting an iodinated dye into a blood vessel and doing a CT scan. MRA is a different compound (usually gadolinium) to also provide axial studies of blood vessels in the brain. Both can be used in the acute trauma setting, but are usually more a part of an interim workup.

8. Glasgow Coma Scale

You will see this frequently in the emergency room records. The Glass Scale is a clinical assessment of state of consciousness. It awards certain point values for certain physical findings. A score of 15 is considered normal. Attorneys should be aware that the Glasgow Coma Scale is skewed to the very seriously injured. You will note that even one point off the normal is a markedly abnormal finding. You should be aware to quickly dispel any notion by defense lawyer that since your client had a 13 he was close to being normal. Even one point off suggests a serious injury.

Neuropsych Testing

Overview

Neuropsychological testing is perhaps the most sensitive diagnostic modality available to delve into brain injuries that have not resulted in an abnormal objective finding. However, they are not limited to those kinds of situations. Even with clients who have had major trauma to the brain that has been diagnosed, worked up and treated, neuropsychological testing can reveal functional changes in a person's personal profile that can severely impact their future life. In any patient with significant head trauma, neuropsych testing should be considered, especially when you hear families saying things like "Daddy's not right anymore" or "My husband's memory is failing" or "John can't make plans anymore".

Neuropsych tests are designed simply to provide the examiner with a connection between certain functions and areas of the brain that have been affected by trauma. The manner in which these tests are performed ensure that they are indicative of a peak level of cognitive performance. One test commonly performed as part of the standard battery is the Minnesota Multiphasic Personality Inventory, or MMPI.

Cost

Costs of a neuropsychological evaluation can be substantial. You can expect that a full examination will cost between \$2000 and \$3000. If you have hired the doctor performing the examination, you can expect that the report will be included in that fee but any testimony will be extra. Ideally, if the patient is truly having difficulties, his own physician should order the tests. That way the neuropsychologist was a referral of the doctor and not you. Most health insurance companies will cover neuropsych examinations if the referral properly papers the file. However, in the right kind of case, the attorney may need to order such an examination. Having a regular, well-respected neuropsychologist available to you can add significantly to the value of your brain injury cases. Sometimes, the patient's suggestion to the doctor of certain symptoms containing buzzwords can spur the doctor into making the referral.

What It Shows – Cognitive Issues

A properly performed battery of neuropsych tests can reliably and predictably describe deficits in the following areas:

- Intelligence
- Memory
- Language
- Executive function
- Visuospatial

A good neuropsychologist will examine all the relevant medical records as well as many of your clients premorbid history, including educational records, employment records and others. There is always a forensic aspect to neuropsych exams because the neuropsychologist seeks to describe the patient's current condition as either unaffected or negatively affected by the traumatic incident.

When appropriate, a good neuropsych can examine for specific issues such as dementia.

How it's Done

After performing a thorough review of the patient's medical, educational, employment and interpersonal relationship history, the neuropsychologist will try to identify subjective areas complained of by the patient and/or those close to the patient after interview. The tester then uses these profile specifics to administer tests to the patient. This is usually done over the course of the day though patients who are ill or who have limited mental abilities can take a number of days to administer. They are given in a quiet, controlled environment designed to maximize performance.

Several tests of malingering should be administered during the course of the examination. Without that, a good neuropsychologist is unable to tell if the patient is providing maximum effort. Furthermore, when in litigation, having such tests administered can enhance the credibility of the expert as well as the client by showing the jury that the potential for malingering was assessed objectively.

For those attorneys who think that neuropsych testing is some kind of mumbo-jumbo, I urge reconsideration. Though many people don't even know what a neuropsychologist is, neuropsychology is a well-accepted field that is well researched and documented. The Ph.D. neuropsychologist has many years of postgraduate training and between one to three years of mandatory clinical internship. I personally consider a neuropsych exam mandatory in any client I have that has suffered any insult which may be referred to the psyche. For example, a client of mine with a negligently perforated bowel went undiscovered. A neuropsych exam proved that the patient's significant decrease in cognitive abilities was due to the very prolonged hospitalization required. It easily identified specific areas as well as identifying a significant portion of posttraumatic stress. I believe it significantly enhanced the value of the case.

Data vs. Opinion and Neuropsych Privilege i.e., Yours vs. Theirs

When utilizing neuropsychology there are a couple of litigation tidbits of which you should be aware.

First, you will need to make sure at deposition to extensively voir dire your neuropsychologist and have them explain in detail exactly what the science is.

Second, you need to understand the practice in order to deal with the other sides' expert. Though the defense routinely demeans the reliability of neuropsychological testing, they will usually appoint one of their own as a designated testifying expert. Invariably, data generated by your neuropsychologist will be requested in discovery. Attorneys need to be aware that under the ethical rules of neuropsychology, the hard data - the test results themselves - are not discoverable. The neuropsychologist may only forward the test results to another neuropsychologist. When answering discovery, you will need to provide her treating or testifying neuropsychologists report. You will then need to make a statement in your discovery responses that data and test results will be forwarded to another neuropsychologist of the defense's choosing, but not the attorney. The ethical constraints area is as follows:

9.04 Release of Test Data

(a) The term test data refers to raw and scaled scores, client/patient responses to test questions or stimuli and psychologists' notes and recordings concerning client/patient statements and behavior during an examination. Those portions of test materials that include client/patient responses are included in the definition of test data. Pursuant to a client/patient release, psychologists provide test data to the client/patient or other persons identified in the release. Psychologists may refrain from releasing test data to protect a client/patient or others from substantial harm or misuse or misrepresentation of the data or the test, recognizing that in many instances release of confidential information under these circumstances is regulated by law. (See also Standard 9.11, Maintaining Test Security.)

From Ethical Principles of Psychologists and Code of Conduct, American Psychological Association, Adopted August 21, 2002, Effective June 1, 2003 with the 2010 Amendments Adopted February 20, 2010, Effective June 1, 2010.

Most neuropsychologists interpret this ethical code to require them to release raw test data only to other equally licensed psychologists.

With respect to a defense neuropsychologist expert, it is generally well accepted that a neuropsych examination should not be repeated within a year of the previous exam. This is because that the results of a re-examination done too closely can be affected by a learning phenomenon. Neuropsychologists are generally well aware of this and will accept your treating or testifying neuropsychologist's raw data in lieu of a re-examination.

Treatment Plan Is Often Extensive

Neuropsychology is not just a diagnostic tool. Neuropsychologists often engage in treatment of patients as well. Based on the neuropsychological examination, a neuropsychologist will sometimes prescribe many different kinds of therapy to address the results of the testing. The neuropsychologist will often work with the treating neurologist in this respect.

Back Injuries

The majority of back injuries from motor vehicle wrecks occur in the lumbosacral spine. The diagnosis and workup of any injury to the spine is similar and driven mostly by the nerve roots affected. When spinal injuries are in the neck area, symptoms can affect the arms, legs, and middle of the body. The symptoms may occur on one or both sides of the body. Symptoms can also include breathing difficulties from paralysis of the breathing muscles if the injury is high up in the neck.

When spinal injuries are at chest level, symptoms can affect the legs. Injuries to the cervical or high thoracic spinal cord may also result in blood pressure problems, abnormal sweating, and trouble maintaining normal body temperature. When spinal injuries are at the lower back level, symptoms can affect one or both legs. Muscles that control the bowels and bladder can also be affected.

Anatomy

I'm going to open this topic by offering a piece of advice. Never try to go toe to toe with an orthopedic surgeon or neurosurgeon concerning spinal anatomy. It is extremely complex and requires a thorough three-dimensional understanding of highly interrelated structures. If you are trying to take the deposition of one of these doctors, they will easily confuse the testimony using complex medical terminology. Often the terminology is counter intuitive. For example, how many of you believe that the term discectomy means removing the disk? Well, it doesn't. What it actually means is to remove a portion of the inside of the disk that is compromising a neural structure. That's why you can get recurrent herniations at a spinal level where a discectomy has already been performed.

At trial, if the case damages warrant, you should always use the services of a medical illustrator to assist your testifying expert. You should find out what the expert wants to say to the jury and work with him/her and the illustrator to use demonstrative evidence illustrations that are easy to understand and work with your expert. Often, most illustration firms have stock material that doesn't cost a lot. Make sure you check before you reinvent the wheel. (SLIDE 7)

The spine is separated into different segments: cervical, thoracic, lumbar and sacral. Usually there are 8 cervical vertebra, 12 thoracic, 5 lumbar and the sacrum, which has five levels but they are fused into one bone. There is a lot of variability in the sacrum. Though you will see numbers like S1 and S2, you need to understand that the sacrum is really just one bone. With regard to the sacrum, the "S" terminology refers to where nerve roots exit from the sacrum, which is mostly what is discussed during this type of injury.

The spinal cord itself gives off one nerve root each side generally at each level. The nerve root exits the spinal column below the named level. In other words, the L5 nerve root exits the spinal column below the L5 vertebral body. So, the designation "R L-5 nerve root" means the nerve root exiting below the fifth lumbar vertebra on the right side.

This terminology actually carries through into soft tissue. In other words, somebody with a low back strain may demonstrate muscle tenderness at the right L1 through L5 area. This is not technically correct, but common notation you are likely to see in medical records.

The anatomy of the muscles of the lower back is also fairly complex. However, orthopedic surgeons sometimes don't really understand it either. You will see orthopedic surgeons and emergency doctors using terms like lumbar strain or sprain and lower lumbar back pain.

1. Soft Tissue

Probably the most common injuries you will see in a car wreck are muscular injuries, commonly in the neck and back. These are usually treated in the emergency context by the emergency doctor referring your client for physical therapy or chiropractic care. While these injuries and forms of damages are quite common, they don't provide a huge damages package. The below is a list of common soft tissue injuries:

1. Muscular
2. Strains - usually better 6-12 weeks
3. Sprains - involves ligaments (supporting structures) variable depending on location, occasionally surgery. Spinal ligament damage can occasionally result in spondylolisthesis requiring surgery
4. Treatment usually chiropractic treatment, massage, physical therapy

Muscular Injuries

Muscle injuries are quite common and fairly benign. They involve subjective reporting to a caregiver of back pain in the absence of any objective findings. Occasionally, you may see a doctor refer to muscle spasm in the affected area, which is some objective finding to suggest your client really has an injury. Most often these injuries are in the lower back and neck area. Therefore, neck and cervical generally mean the same thing in records 99% of the time.

Muscle injuries are almost always self-limited and are treated with local therapies such as heat, massage, and ultrasound. These kinds of injuries are either not referred for further care or are referred for chiropractic and/or physical therapy type care. They should resolve in four weeks with conservative care. Damages associated with them are therefore relatively minor, but very frequent.

Strains

The term strain is common. There is no specific meaning and understanding of what the injured party means when they make a complaint of a strain. Usually you will see this term associated with lower back and neck areas. They are commonly associated with deceleration type injuries. In the neck area, "whiplash", a form of deceleration injury to the neck, often results in "cervical neck strains".

Sprains

There is a lot of overlap and confusion between the terminology of strains and sprains. However, the term sprain when used correctly implies trauma to a support structure, usually a ligament. Attorneys most commonly see this in the ankle, but they are also prone to occur in the back as well. Be aware that a true back sprain can be quite serious. The ligaments that run up and down the spinal column are designed to hold each vertebra in alignment with the next one. If they are damaged or

stretched you can get something called spondylolisthesis. This is a complicated, unpronounceable word which basically means misaligned spinal column. This can often necessitate fusion if the spinal cord is compromised or nerve roots are compromised by misalignment.

Diagnosing sprains is generally more complex than that for strains. In fact, more serious sprains can actually be diagnosed on scans. In the ankle, sprains are graded I through IV. For Grades III and IV, the attorney should look to see if an MRI was done. Often the ligaments in question are swollen because of the trauma. A good radiologist might read that and report. This gives you an objective finding to support claims that are often nothing more than a subjective complaint.

Treatment

The treatment of sprains is usually conservative and non-operative. Grades I and II are usually treated with nothing more than rest and local therapies such as rest, heat, cold and massage. More serious sprains in the III and IV categories often involve placing the joint in a non-weight-bearing fashion. This means that your client can be told to walk with crutches and stay off the affected extremity for a period of time. If you have a client with a diagnosed grade IV sprain, you should keep an eye out because some of these may end up in surgery to repair ligaments. Do not settle a case with this kind of a sprain early on because you may find yourself with a client that needs surgery in a settled case.

2. How are back injuries diagnosed?

Obviously, injuries to the spine generally involve more complex medicine and larger damages. The workup of a client with a potential spinal injury consists mostly of the following:

Neurological examination

I cannot stress enough how much information is contained in a good neurologic examination. It is unusual for a neurologist to be involved with a traumatic spinal injury, but if one is pay special attention to the neurological examination. Neurosurgeons do a much better job than orthopedic surgeons, but the availability of objective studies has minimized the importance of a good examination to physicians. You should watch out for the occasional doctor that remembers how to do one. A lot of information can be gleaned from such an examination.

Plain X-Rays

The most common studies performed initially are plain x-rays. You need to be aware that on occasion, an emergency room doctor may initially clear your client as not having a fracture, only for your client to be called back days later because a radiologist has “over read” the emergency room films and noted something that was missed by the emergency physician. This is not as unusual as it seems. You should never rely solely on the written emergency physician report of an x-ray. Always refer to or wait for the formal report from the radiologist. Most hospitals have specific over read programs to make sure that their emergency room physicians do not miss fractures, among other things.

CT

As discussed previously, CT scanning involves the use of x-rays. Therefore, it is particularly useful in looking at the spine. The vertebral bodies are bone and therefore show up particularly well on CT scans. However, CT scanning is not particularly good for soft tissues. For example, on the CT scan, pictures of the spinal cord within the vertebral column can be seen, but are of limited diagnostic usefulness.

MRI

A MRI of the spine is more frequently used today. For most spinal trauma the issue is not whether there is a transverse process fracture, but whether the transverse process fracture has impinged on a nerve root. Therefore, the MRI is far superior in analyzing the nerve roots and spinal cord. Most orthopedists and neurosurgeons will not operate without one.

These studies are excellent for determining whether there is something pressing on a nerve root or the spinal cord itself. They are not useful for determining what causes or has caused the reason for the pressure. It is often done, but radiologists are poor testifiers concerning causation.

MRI reports often contain a lot of medical jargon. Usually, a specific finding can be described in a number of ways using a number of different terms. When reviewing an MRI report, the attorney should look for areas of neurologic compromise, i.e. something is pressing on something that shouldn't be pressed on. Often, that is the salient point from an MRI report. Occasionally, you may see the radiologist make comments correlating the radiologic finding with whatever history they have. That is often useful. For example, the radiologist might note that the nerve roots at C3 and C4 are narrowed consistent with the patients reporting of arm weakness. Look for these.

Myelography

Myelography involves putting dye into the spine and taking x-rays. Usually the dye is put into the epidural space. It is allowed to flow upwards as the patient is tilted. (The dye is denser than cerebrospinal fluid.) The dye can provide contrast of the spinal cord and nerve roots. It is a very sensitive study for spinal cord and nerve root compression. Because it is invasive and involves putting a needle into the back, it is not frequently used anymore in favor of MRI. There are still some older neurosurgeons that won't operate without one, but this test is rarely done today.

Electromyogram and NCS

Electromyography is a test which evaluates the communication between a nerve and muscle. Nerve conduction studies measure the speed at which a nerve impulse is transmitted down nerve, both peripheral and spinal. These tests are commonly performed together. You may see the terminology EMG/NCS. Tests are usually performed and interpreted by a neurologist. They can give extremely sensitive and accurate information concerning nerve function and anatomy. For example, a patient with right lower extremity weakness clinically may have these studies done. They can demonstrate delayed conduction down the sciatic nerve, and point to lower lumbar nerve roots. These tests can provide a significant objective diagnoses and accurate data that assist you in connecting a subjective report of weakness to a spinal lesion. Do not overlook them and do not underestimate them.

Types of Lumbar Spine Injuries

Disc Herniations

Lumbar spinal injuries separate into two general categories (excluding fractures). The first category involves the discs that sit between the vertebral bodies and the second involves movement of one spinal vertebra on another.

The subject of disc herniation is fairly complex, but most of the complexity involves fixing the problem. Think of the disc itself as a very strong fibrous bed with a thick gelatin core. The disc acts as a shock absorber and flexible joint between the vertebral bodies. As we age, it is normal for the discs to become degenerated. (More on this below.)

Sudden forces applied to the spinal column can result in the bag of gelatin being squeezed too hard and some of the goo in the middle thereby being squeezed out. Almost any sudden movement of the spine can cause a herniation. Do not accept from the defense that just because it was a low velocity collision there could not have been a herniation. Usually one thinks of herniations caused in the lumbar spine by forward and backward movement during deceleration. However, when looking at a motor vehicle wreck, the attorney should keep in mind that axial forces (twisting) can also cause disc herniations. The term in medical records used for the goo in the middle is “nucleus pulposis.”

When part of the “nucleus pulposis” goo is pushed out through a crack in the tougher exterior, it can impinge on structures. This is a herniated disc. You may also see the terminology “HNP” in medical records, which means nothing more than a herniated nucleus pulposis. Same thing.

When the extruded HNP goes posterior, it can impinge on the spinal cord itself. If it goes lateral or posterolateral, it can impinge on a nerve root. Be careful to NOT confuse the two. They are distinctly different problems and have distinctly different effects on your client. Disc material pressing on a nerve root affects only that nerve root. Disc material pressing on the spinal cord can affect every function mediated by the spinal cord below that level. The vast majority of ruptured discs occur lateral and posterolateral, so it is much more likely to see nerve root impingement than the spinal cord itself being affected.

1. Signs and Symptoms

The signs and symptoms of nerve root compression directly correlate with the nerve roots being compressed. For example, a left L3 L4 nerve root compression can cause weakness in extending the knee because it affects the quadriceps muscle. Understanding the part of the body affected can provide a map to where the lesion is. If a client takes three weeks to have such a ruptured disc diagnosed, the clues can be connected by looking at the emergency room records and finding out that he was complaining of weakness in the quadriceps from the get-go.

The signs and symptoms of spinal cord compression syndromes are related to the level at which the compression occurs. The clinical syndrome is much more extensive than for a nerve root compression because every function mediated by the court below that level is likely to be abrogated. Because of the anatomy, direct posterior herniations are unusual. And because the spinal cord has

cerebrospinal fluid around it, it is usually much more tolerant of impingement by disc material than a nerve root.

One special note should be mentioned. An infrequent but very serious complication of spinal surgery is an epidural hematoma in the spine. The spinal cord, like the brain, is surrounded by a fluid in which it floats. That is the same cerebrospinal fluid that circulates around the brain. But, like the brain, the cord is surrounded by a bony structure which is inflexible. If an epidural hematoma forms as a complication of surgery it can very quickly compress the spinal cord. In the lumbar level, this can result in something called cauda equina syndrome. In the lumbar back, the spinal cord actually ends usually at L1 or L2, but all of the nerve roots are still within the spinal canal and surrounded by bone. They travel down inside the spinal canal and exit at their appropriate levels. Diagrammatically this looks like a horse's tail, hence cauda equina. You need to be aware of this because as a known complication of lumbar final surgery, it is likely you will see this in your career. There is a very narrow window to relieve this pressure. If it is not, your client may be left with bilateral low extremity weakness and loss of bowel and bladder control. If you should see this, you should probably call your local medical malpractice specialist to review the case.

2. Central vs. Posterolateral (Cord and Stenosis vs. Nerve Root)

Most traumatic disc ruptures occur posterolaterally. Therefore, if they cause an impingement syndrome, it is usually derivative of the nerve root defined by the level above the lesion. Not all disc ruptures will cause an impingement syndrome. This can lead to a difficult litigation question. If there is a disc rupture and the extruded disc material is near the nerve root but not impinging, is that a compensable injury? I don't think there's a hard and fast answer but I think that if you can show that the rupture is new, it should be. And what the attorney needs to be aware of is that anytime there is disc material outside of the disc, the patient is at enhanced risk for impingement syndrome. Disc material can move!

When the disc ruptures posteriorly, it presses on the dura and narrows the spinal canal. You will often see this described in an MRI as a protrusion into the canal which does or does not make contact with the cord. Making contact with the cord is the threshold for the creation of an impingement syndrome. A term frequently used for such a narrowing caused by a ruptured disc is effacement. Akin to extruded disc material that does not yet impinge on a nerve root, it is up to the attorney to try to prove that such a narrowing caused by an acutely ruptured disc is a compensable injury. Obviously, posterior disc rupture which compresses the cord is a surgical emergency.

3. Spondylolisthesis

Occasionally, trauma can result in one vertebral body moving on the other. This can be caused by disruption of the ligaments which keep the vertebral bodies in alignment. In diagnostic studies you will often see this as an "anterolisthesis" or "retrolisthesis" or "anterior/posterior movement" of one level on another. The clinical importance of such a finding is that the spinal canal to find by the bony structures surrounding it. When a spondylolisthesis occurs, the spinal canal is often narrowed, or stenosed. If the movement is extreme, the cord itself can be compromised as the anatomy of the canal is no longer linear. Occasionally this can be a surgical emergency requiring repositioning the vertebral segments to relieve the pressure and fusing them.

4. Fractures

Fractures are an unusual finding in wrecks, but can be devastating. The topic is too complex for this particular presentation, but there is one particular kind of fracture for which the car wreck lawyer should look out. Vertebral compression fractures occur in trauma. The vertebral body actually compacts on itself. It is a true fracture. It is extremely painful for your client and, if there are adjacent compressions, can compromise the cord. The pain is usually acute and temporally related to the wreck itself. This is a lesion which should not be difficult to causally relate to the wreck. They are usually repaired by injecting bone cement at high pressure into the vertebral body to restore its height.

5. Predisposition

There are a number of factors which can predispose your client to spinal injuries in a car wreck. You should be aware of them because they can arise in several different contexts, the most important for you being the eggshell plaintiff.

- Age

Age is probably the least understood of the predisposing factors for spinal injury in a wreck. As a general principle, it is true that the older population has more of a propensity for spinal injuries in car wrecks than the younger. But it is not a rule and you should never let the defense argue that your client was young so they could not have been injured in your wreck.

The context in which age arises most often concerns acute disc herniations. As we age, the fibrous bed containing the disc material begins to degenerate. That means it gets more fragile. You will often see on MRIs of older folks the term “degenerative disc disease.” A typical defense argument is that because your client had degenerative disc disease, that is what caused the herniation and not the car wreck.

You will often see degenerative disease associated with the bony structures of the spine itself. I try to think of these arguments more as fragile plaintiff arguments than arguments of causation for the defense. However, much litigation concerning back injuries in car wrecks concerns whether your client with degenerative back disease was injured by the car wreck or in fact by his own body.

- Osteoporosis

Osteoporosis is nothing more than a loss of calcium in the bone. It decreases the tensile strength of the bone and makes the bone more susceptible to traumatic disruption. It can even lead to collapses of the vertebral bodies themselves. This is often described as loss of height on x-rays. An osteoporotic spine is an invitation for a defense lawyer to argue that the injury was pre-existing.

- Prior conditions or injuries

Obviously if your client has had prior pre-existing back conditions and or injuries, a car wreck can be a nightmare. The topic is way too extensive to discuss in this presentation, but the principles of

diagnosis are the same.

- Eggshell plaintiff

A theme which has infused this discussion concerns the eggshell plaintiff. We all get old. Many of us get osteoporotic. But that does not mean that if such a person is injured in a car wreck, that the injury was due to the underlying, pre-existing condition. Instead of allowing the defense to argue that the pre-existing condition caused the damage, every effort should be made to describe the pre-existing condition as something which made your client more susceptible to being injured. This is also true in a much more fact sensitive context in those clients with prior conditions or injuries.

6. Treatment

The treatment of acute disc herniations depends a lot on the physician. In a case where the pressure caused by the herniation is obviously acute, intervention is almost always indicated.

- Physical Therapy

The least invasive treatment involves physical therapy. This can be done by physical therapists or chiropractors, but consists mostly of strengthening exercises. The theory is that such exercises and strengthening will prevent the herniation from having a significant effect on your client. Sometimes it works, sometimes it doesn't. The science on physical therapy relieving pressure from an extruded disc pressing on a nerve root is not good, but it is common.

- Epidural injections

Epidural steroid injections involve usually an anesthesiologist and occasionally an orthopedist injecting a combination of anesthetics and steroids into the epidural space near the nerve root compression. The theory in this procedure is that the anesthetic provides some immediate relief and the steroids reduce inflammatory response and swelling, thereby giving the nerve root more space to live. These are frequently very helpful. Occasionally there are curative, and more frequently they are temporizing. The current literature strongly suggests that no more than three epidural steroid injections should be done at the same level. The defense will commonly look for extended strings of such injections and rightfully object. Generally if three injections have not provided long-term relief, surgery should be considered.

- When/if to operate

If the patient is not responsive to therapeutic interventions at all, surgery will generally be considered. The aim of the surgery is to relieve the pressure on the nerve root created by the extruded disc material. You will see terms such as laminectomy, laminotomy, foramenotomy, facetotomy, facetectomy, etc. Do not get tied up in the nomenclature. All the procedures are designed to remove the offending disc material from off of the spinal nerve root.

There are a couple of special notes to remember. As was explained above, only the offending disc

material pressing on the nerve root or spinal cord is removed during a discectomy. ***The disc itself is not removed ever.*** This gives rise to the potential for recurrent disc herniations. These occur at the same level of a prior herniation. They are not uncommon and they should not be unexpected by the practitioner. The setting is commonly someone has a discectomy in year one, and five years later is in an accident and has another herniation at that same level. The fact they had a discectomy at that level does not mean they can't get another one.

- Fusions

A spinal fusion is nothing more than connecting one vertebral body to another. There are various ways of doing it and various approaches that are used. Fusions are usually utilized when the physician believes it is necessary to prevent movement of one vertebra near another. Settings include recurrent disc herniations, some first-time disc herniations, spondylolisthesis, spinal canal stenosis and others. A few aspects of spinal fusions need to be understood.

First, the surgical approach can be from the front or the back and occasionally both. These are known as 360s. The specifics of technique depend on where in the spine and are not the subject of this paper. Fusions sort themselves into two general categories: instrumented and non-instrumented. Non instrumented fusions involve placing bony graft material between the vertebral bodies and allowing them to grow together into a single unit. Non instrumented fusions are rare in today's world. Instrumented fusions use devices to help stabilize the two vertebral bodies, usually while the bone graft completes the fusion. From the anterior approach, you often see plates used. From the posterior approach, pedicle screws are often used. In both cases the devices are used to hold the vertebral bodies in place while the permanent bony fusion forms.

A special note for attorneys concerning fusions involves the phenomena of adjacent disc disease. Whenever one of your clients has a fusion, a component of your future damages should be the invocation of adjacent disc disease. This is a well documented phenomenon because discs are really joints. They are designed to move. Fusions remove that capability. And this affects discs both above and below the fusion and accelerates their degeneration. You should always seek to elicit testimony concerning adjacent disc disease from treaters and or experts were commenting on your clients fusion.

- Special issues

There are a few special issues which probably need to be mentioned.

Occasionally your client may have a prior study demonstrating that the damages from the wreck were in fact not present before the wreck. This is always fortuitous but can cut in both directions. An MRI six months before the accident of the affected area showing perfectly healthy discs makes it more difficult for the defense to argue that the herniation was not due to the car wreck. The closer the timing of the study to the wreck, the easier it is to deflect the argument. Finding such a pre-wreck study is unusual and more often than not, such a study in fact does not help you because it shows pre-existing disease.

As discussed above, we all get old. This leads to physiologic and anatomic changes which can predispose us to being injured in a car wreck. The defense will always argue that the injury was

pre-existing. It is up to the plaintiff's attorney to scour the medical record for indications that it was not. Typically, the defense wants extended periods of medical records and is looking for "back pain" anywhere in those records to suggest the injury was pre-existing. The dynamic is obvious. The plaintiff's attorney knows that few people get into their latter years without having had some back pain. That back pain is probably unrelated to the car wreck. You should scour the records very carefully for historical indicators that demonstrate your client was fully functional without pain prior to the accident. This can be drudgery, but it is important when you try to establish that the car wreck resulted in your client's condition, not some other speculative nonsense. The attorney should do their best to limit the production of such records as non-relevant.

A suggestion is to focus on all the evidence describing your client's function. It is difficult for the defense to argue that a complaint of back pain seven years old ago resulted in your client's current condition if the medical record has 20 intervening physician contacts without any complaint of back pain. It's sort of like proving a negative, but it can be done. It just requires a careful and thorough examination of the medical records.

Another practical note concerns using orthopedic surgeons as testifiers. Many treating orthopedic surgeons will not even accept car wreck patients. Others will treat but will charge exorbitant amounts of money to offer testimony on the half of your client, and their patient. Testifying experts can get \$2000 an hour. I personally believe you can increase the likelihood of a treater offering testimony on behalf of your client if you have a thorough knowledge of the medical records and can present an argument for their participation based on the treater's own records. Attorneys should be aware that using such deposition testimony can increase costs significantly.

Cervical Injuries

I have not specifically discussed cervical and thoracic spinal injuries because they are not significantly different than those that occur in the lumbar region. The damages, of course, are still determined by the nerve structure that is compromised, but the terminology, operative procedures, and outcomes are similar.

There are some special circumstances deserving mention.

First, cervical spinal injuries are usually handled by neurosurgeons, though not always. This is because the structures in the cervical spine are much smaller than in the lumbar spine. Also, the training of the neurosurgeon is much more specific for structures in the neck than that of the orthopedic surgeon. There is a lot that can get screwed up pretty easily in the neck and a lot of orthopedic surgeons simply don't want to mess with it.

Remember that a cord injury in the neck will affect every part of the body distal to the injury. Where an acute L5 disc level may only result in bowel and bladder dysfunction and lower extremity weakness, a high cervical level can result in quadriplegia.

Another aspect of spinal injuries in the neck concerns the surrounding structures. Whenever you are operating in the neck there is risk to some very important parts of your body such as the carotid arteries, jugular veins, cranial nerves and a host of very sensitive structures that must be avoided. A special note is that high cervical neck surgery can on occasion compromise your client's breathing.

This is because the phrenic nerve, the nerve which innervates the diaphragm, arises from C3, 4 and 5.

One cervical injury commonly encountered in car wrecks is whiplash. This occurs in a sudden deceleration because the head is unrestrained. The head “whips” forward, reaches the end of its extension or the car, and then “lashes” backward. This can occur as a “bouncing” several times. In the worst-case scenario this can result in contracoup subdural hematomas. However, whiplash can also result in a lot of other symptoms such as neck pain and stiffness, headaches, pain in the shoulder or between the shoulder blades, low back pain, pain or numbness in the arm and/or hand, dizziness, difficulty concentrating or remembering, irritability, sleep disturbances, or fatigue. Whiplash is a real injury and is well documented.

Joint Injuries

Any joint can be affected in a car wreck. The specific injuries and treatments are beyond the scope of this presentation. However, the most commonly large joints injured are knees, shoulders, hips, and ankles.

There are a few specific points I'd like to mention that attorneys should know. The advent of arthroscopic surgery and increased accuracy of MRIs has led to an increase in the diagnosis and treatment of several injuries frequently seen in car wrecks.

The first one is the SLAP tear of the shoulder. SLAP stands for Superior Labral Tear Anterior to Posterior. Think of the shoulder as a ball and socket joint. The upper arm bone, the humerus, has a ball on it. This ball fits into a cup in the shoulder called the glenoid. The problem is that only the very bottom of the cup is bone. The surrounding edges, called the labrum, are made of a tough cartilage. The shoulder is another joint with exceedingly difficult anatomy. There is also a lot of arcane nomenclature. It can be difficult to get shoulder surgeons to reduce their testimony to something a jury can understand. You can lead your treator by suggesting the ball and cup image and hopefully he will keep it simple.

SLAP tears in car wrecks usually occur when the arm is extended to brace for a deceleration and is suddenly pushed backward. The edge of the cup breaks off. Major symptom of the SLAP tear is pain and limited motion. SLAP tears can be very significant for clients, especially if they are in the dominant arm and the client is active. Physical therapy is often used, and they can improve, but surgery is usually required to reconstruct the cup. The vast majority of these procedures are done arthroscopically and the damage to the cup is repaired. Again, there can be a long delay between the car wreck and the actual diagnosis of SLAP tear so this is an issue for attorneys.

A similar injury can occur in the hip. When the knee is pushed backwards upon deceleration, the posterior rim of the socket, also called the labrum, can be knocked off. Again, the symptoms are pain and limitation of motion. These repairs also are usually done arthroscopically.

Whenever there is a significant joint injury, the attorney should always query the health care provider to determine whether a joint replacement is in your client's future. Even an increased chance of needing a joint replacement as a result of damage caused in the wreck should be a component of the client's future damages.

As with back injuries the issue of “acute” or “chronic” injury often makes its appearance. Dealing with this issue is usually easier than for back injuries, but still requires a careful and complete analysis of the client’s prior medical history. In any case, a prior history of joint damage should always be addressed in the context of an eggshell plaintiff.

One aspect of joint injuries that is often overlooked is known as post traumatic arthritis. Injury to joints from car wrecks can damage the articular surfaces of the joint and lead to increased rapidity of the joint degenerating. Often this damage is to the articular cartilage. This should always be a consideration in future damages when analyzing your cases. Do not ever let the defense tried to convince you that post traumatic arthritis is a bogus condition. When obtaining reports from or deposing your treaters, always get them to comment on the likelihood of accelerated arthritis in the affected joint due to the car wreck. Try to have your client asked the treater during a routine visit. This will set the idea up in the treater’s mind and he will likely repeat what he told your client in his report or his deposition.

Diagnosing an injury suffered in a car wreck is tricky – remember to look at the story the medical records tell and to use this as a tool against defense attorneys during litigation.