

Welcome:

This course is approved for 4 History & Examination – Diagnosing Whiplash for the Chiropractic Board of Examiners for the state of California.

There is no time element to this course, take it at your leisure. If you read slow or fast or if you read it all at once or a little at a time it does not matter.

How it works:

1. **Helpful Hint: Print exam only and read through notes on computer screen and answer as you read.**
2. **Printing notes will use a ton of printer ink, so not advised.**
3. **Read thru course materials.**
4. **Take exam; e-mail letter answers in a NUMBERED vertical column to marcusstrutzdc@gmail.com.**
5. **If you pass exam (70%), I will email you a certificate, **within 24 hrs**, if you do not pass, you must repeat the exam. If you do not pass the second time then you must retake and pay again.**
6. **If you are taking the course for DC license renewal you must complete the course by the end of your birthday month for it to count towards renewing your license. I strongly advise to take it well before the end of your birthday month so you can send in your renewal form early.**
7. **Upon passing, your Certificate will be e-mailed to you for your records.**
8. **DO NOT send the state board this certificate.**
9. **I will retain a record of all your CE courses. If you get audited and lost your records, I have a copy.**

The Board of Chiropractic Examiners requires that you complete all of your required CE hours BEFORE you submit your chiropractic license renewal form and fee.

NOTE: It is solely your responsibility to complete the course by then, no refunds will be given for lack of completion.

Enjoy,

Marcus Strutz DC
CE Provider
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4 History & Examination – Diagnosing Whiplash

Presented by Steven C Eggleston, DC, Esq.

Objectives

The course will teach how to consult, examine and diagnose whiplash injuries and the most common injuries associated with whiplash injuries. They will be taught how a thorough and proper history and examination will lead to the correct diagnosis the first time and that they owe that to their patients. The chiropractor will understand that there are far more injuries that patients have during whiplash and that they are professionally responsible under section 317(w) to recognize, diagnose and refer out these injuries.

Hour 1

The Chiropractor will be instructed why one-third of car accident patients heal completely with only chiropractic care in less than three to four months. They will learn statistics from the National Institutes of Health on the incidence of PTSD in trauma patients as well as various studies that show 24% of concussion patients develop sleep apnea and 80% of concussion patients have low testosterone which slows down healing.

Hour 2

There will be a discussion of simple muscle injuries that should heal in six to twelve weeks versus torn tendons and ligaments which never heal and usually require a referral in order that the Chiropractor does not violate Section 317(w) of the California Board Rules and Regulations. The Chiropractor will be instructed on ligament referred (sclerogenic) referred pain based on the work of Janet Travell, MD, who was President John F. Kennedy's personal physician and wrote the book on trigger point therapy.

Hour 3

The Chiropractor will be instructed how X-ray findings correlate with clinical symptoms, the formation of degenerative arthritis in traumatized joints and to understand the best treatment options for patients that have torn spine ligaments. There is a discussion of making referrals for Prolotherapy, PRP and Stem Cell treatments when the treating chiropractor discovers the X-ray finds that are pathognomonic of torn spine ligaments.

Hour 4

The chiropractor will be taught how to consult with a trauma patient with torn spine (or other) ligaments. How to examine the patient radiologically and which x-ray films are most diagnostic for these injuries. The most respected tests with courts and jurors are demonstrated and the Chiropractor is taught how to better utilize these tests in order to know exactly what is wrong with the patient.

As the name implies, Whiplash is a syndrome of various and different injuries that are associated with car accidents. It can include neck and spine injuries, brain concussion, post-traumatic stress disorder (PTSD), torn ligaments in the joints of your arms, legs or spine, nerve damage, inner ear damage, irregular heartbeats, damage to internal organs, broken bones, broken teeth, cuts, scrapes, bruises and many other physical and mental injuries.

In my experience as a chiropractor for thirty years and as a personal injury lawyer for ten years, only about one-third of patients fully recover after a car accident. It is difficult to predict those that will get completely well. It is easier to determine which patient will not get well in the first few weeks after an accident. The Chiropractor should be able to accurately predict within the first 2 weeks whether a patient will recover completely with chiropractic care, whether the patient will need injections, whether the patient will need surgery and whether the patient will not recover completely. This course you figure out as quickly as possible what is wrong with your patient.

Many are surprised to learn that anxiety is the most common symptom after a car accident. It is even more common than neck pain. Seat belts and shoulder belts can cause injuries to your heart and you won't find out for weeks or months or years later. A study published in 2007 found that people under 50 years of age who are in car accidents have a 400% higher chance of getting some kind of heart dysrhythmia or irregular heartbeat. People over 50 only have a 200% higher chance of having these heart problems after a car accident. *Only 200% higher...*

The National Institutes of Health states that car accidents are a common cause of PTSD. 40-50% of car accident victims have a brain concussion. 24% of patients with a brain concussion will develop sleep apnea. 80% of patient with a brain concussion will have low testosterone within one year of the concussion so they will not heal well because they lack the repair and tissue regeneration function of testosterone when they need it most.

All of these and more can be your symptoms if you get Whiplash Syndrome in a car accident. It is a mistake to think that car accidents only cause neck injuries. I will introduce you to many of the various symptoms and injuries that are part of Whiplash Syndrome after a car accident.

Simple Muscle Injuries

Claim adjusters are taught to believe that all "soft tissue" injuries heal in three to six weeks (even without any treatment.) What they are not taught by their employers is that only *one* of the many types of soft tissues will actually heal as they were taught. Muscles are the "soft tissues" that heal in three to six weeks. Muscles have a great blood supply, are extremely pliable and flexible, and most injuries to muscle will heal (as these

insurance adjusters are taught) in about three to six weeks and often without any treatment at all.

The problem begins where insurance companies have taken this basic medical fact that *muscles* heal quickly and have brainwashed their claim adjusters (who have no medical training) to believe that all soft tissues including tendons, ligaments, nerves and brain tissues also heal very quickly. Structures such as ligaments, tendons, nerves and brains definitely do not heal in three to six weeks as the insurance industry has indoctrinated their claim adjusters to believe. In this chapter I will explain the difference between a muscle and a ligament and why this message from insurance companies is medically incorrect.

First of all, the “hard tissues” of the human body are the bones and the teeth. Everything else in the human body is, by comparison, softer than the bones and teeth. There are four of these “soft tissues” from an orthopedic point of view. One of them is the muscles and the other three *soft tissues* are nerves, ligaments, tendons. The ligaments, tendons, and nerves unequivocally do *not* heal in three to six weeks. In many cases, they never heal and you could have a lifetime of pain and suffering if any of these *other* three soft tissues are injured.

Brain injuries (concussions) are a type of soft tissue injury since the nerves inside your brain are soft. Ligament injuries are also a type of soft tissue injury since ligaments are not as hard as the bones. Both nerve and ligament injuries often leave you with permanent impairments and a lifetime of pain and suffering. Tendon injuries can be caused by long term, repeated small injuries (such as tennis elbow) or by one single, sudden trauma such as a car accident or throwing a baseball too hard. Torn tendons and rotator cuff injuries almost always require surgery to repair them and, still, they are never really the same. They can end the athlete’s season or career.

Football players talk about a “blown out” knee which is slang for torn knee ligaments that end that player’s season or career. Football and baseball injuries occur in only one joint but car accidents can tear ligaments and/or tendons in many joints at the same time. Your neck, back, shoulders, elbows, wrists, hands, hips, knees, ankles, feet and jaw are the most commonly injured joints in car accidents.

The insurance company mantra, “It’s only soft tissue injuries” is designed to manipulate the uneducated so that you do not receive the reasonable value of the damage these injuries cause to your body. You should be a doctor that can explain the difference between muscle injuries and the much more serious ones like torn tendons and ligaments.

The car insurance companies have been successful in confusing jury members and even plaintiff lawyers (the ones representing the injured people) regarding these “other” soft

tissues. The primary reason they are getting away with this hoax is that doctors have traditionally done a very poor job documenting them.

In car insurance company language, “non-demonstrable” injuries are those which cannot be shown on an x-ray or MRI. Remember that you must “demonstrate” the injuries to non-doctors on the jury and in the claim adjuster’s office

Tests such as stress x-rays, video fluoroscopy, and MRI are well respected in court and can demonstrate these injuries. When the proper test is simply not done, the jury cannot “see” the injury and the patient cannot prove their case. The medical reality is that muscle injuries are the only true non-demonstrable soft tissue injuries. Tendon and ligament injuries are easily demonstrable if you, the doctor, perform the proper test.

Thus, if all you have is a simple muscle injury, you should heal in three to six weeks and feel 100% better (just as good as you did before the accident.) Your simple muscle injury cannot be demonstrated in an MRI, on x-rays, or even on video fluoroscopy. Your case should be settled quickly and for very little compensation. That is actually good news for you. You got all better and can move on with your normal life.

However, if you do not feel 100% better within three months after a car accident, you absolutely do not have just a simple muscle injury. The patient who is not 100% better after 3 months MUST have a doctor who does the right testing to find the torn tendon or torn ligament that has not healed. If you, the doctor fail the patient, they do not get better AND they do not receive the proper compensation.

Simple Muscle Strains v. Complicated Torn Ligaments

Let me give you a brief summary of whiplash injuries. If you have been injured and have only muscle injuries (sprains), you can expect to heal completely in three to six weeks and feel just as good as you did before the accident for the rest of your life. However, if you injured your ligaments, too, you will not heal in six weeks, six months, or six years.

While a diagnosis of partial ligament tear is bad news for your health, you will at least know what is really wrong with you when your doctor properly diagnoses it. Modern technology allows ligament soft tissue injuries to be visually demonstrated just as obviously as a broken bone on an x-ray. Good doctors can now accurately predict exactly how long it will take for you to heal after the very first examination! All you need is a good doctor to examine you properly. There are modern treatments for torn tendons and ligaments (sometimes without having surgery) that give significant and lasting relief. If your doctor accurately diagnoses your injury and gives you the proper treatment for a permanent ligament or nerve injury, the only other thing you will need is a good attorney that understands these injuries and can explain them for you to a jury or a claim adjuster.

Strain vs. Sprain

Muscles are *strained*. Ligaments are *sprained*.

You should be able to accurately predict after your very first examination and x-rays whether your injuries will heal in three weeks (muscle injury only) or will hurt the rest of your life (ligament injury). A patient should expect his/her doctor to show them the x-ray films and point out whether the ligaments are intact or partially torn. If you are not discussing this with your patients at the report of findings, you are lucky you are taking this online course.

If you still have pain more than six months after a car accident, a "good" doctor will take a look at you, look at the radiology report, look at all the treatments you have received, and then wonder, "What has everybody missed?" He or she may personally look at your x-ray, MRI, or CT films or have another radiologist read them again and discover that the first radiologist missed your true injury.

While the patient is happy that somebody has finally figured out what is wrong, there are two problems. First, a lot of time has passed. This sometimes means that the patient's body healed incorrectly. It can also mean that months or years of getting the wrong treatments will make it so that the patient will never heal properly. The second problem is that the insurance companies will cry foul. They will say that all the doctors who initially treated you were correct and that the latest doctor (who actually is correct) is just making up a new injury to help your lawyer get you more money. You should get it right the first time. You owe that to your patients.

What Can You Do With Incorrect Radiology Reports?

If your patient has neck pain that lasts longer than six weeks, he/she likely has injuries to soft tissues other than just the muscles. The patient probably has torn ligaments and/or tendons. The same is true for back pain or pain in any joint after a car accident. If the radiologist wrote "normal study" but the patient still hurts after six to twelve weeks, take another good long look at the patient and figure out what you missed.

Only some x-ray films will show the effects of torn ligaments. These are called "stress" views and include spine flexion, spine extension and stress APOM views. The last two are special x-rays taken in lieu of a single non-stress APOM view where the doctor has you tilt your head to the left to take one view and then to the right to take the other view.

These two views are especially useful if the patient still has headaches, lightheadedness or dizziness after a car accident. If these stress views were never taken, take them after 6-12 weeks if the patient is not 100% well. If they were taken at the beginning, look at them again and have a good DACBR read them for you.

The Bottom Line Regarding Simple Muscle Injuries

Strained (aka *pulled*) muscles heal by themselves in six weeks (or twelve weeks at the most.) I tell my personal injury law clients, "If your pain lasts longer than this and your doctors cannot explain why you continue to have pain in your neck or other joints, I suggest you find a new doctor that knows more." Be the "doctor who knows more" so your patients receive the best care.

There is no reason that a doctor cannot change his or her opinion if you do not heal in six to twelve weeks. It is common for doctors to state, "I may have underestimated the nature and extent of this patient's injuries. I have re-examined, re-evaluated, and ordered additional tests which now reveal a more accurate picture of my patient's actual injuries. Here is what I now believe is wrong with my patient..."

Pain that lasts longer than six to twelve weeks is not a simple muscle injury but rather involves injured tendons, ligaments, and/or nerves.

Ligaments: The Other Soft Tissue

A torn ligament *never* heals. It leaves your joint permanently unstable. Sure, you can have fusion surgery to fuse your neck bones so they never move again. You can have knee surgery to repair a torn knee ligament but football players are "out for the season" when that happens. You can have surgery on torn ligaments in your spine, shoulders, elbows, wrists, hands, hips, knees, ankles and even feet. Or you can just "live with the pain" as many people do.

Prolotherapy

One very promising treatment that is less invasive than surgery is Prolotherapy which studies have shown can tighten up the torn ligaments by as much as 50%. The doctor injects 5% to 25% dextrose solution into the area of the torn ligament. The dextrose causes scar tissue to form and can actually heal the torn ligament or tendon.

PRP (Platelet Rich Plasma)

Another type of injection that came out of the experience of Prolotherapy doctors is called PRP (Platelet Rich Plasma). The patient has about 6 vials of blood taken from a vein and they centrifuge the blood to separate the plasma and the plates. They reinject it into the joint and the patient's own self-healing mechanisms use their own plasma to heal their injured joint.

Stem Cell Injections

Perhaps the best treatment for torn tendons or ligaments to help patients avoid surgery is stem cell injections. The doctor can use either the patient's own stem cells or can buy them and inject them into the patient. Either way, this treatment has shown extremely good success at healing torn ligaments and tendons.

When you (the doctor) take stress x-rays and find torn ligaments, refer the patient for Prolotherapy, PRP or Stem Cell Injections.

Torn Ligaments Cause Loose Joints

Most of your joints are designed to *glide, not slide*. Ligaments *stabilize* your joints. Ligaments are injured by *tearing the ligament fibers*. Ligaments rip and tear from the *sudden* force that is applied to them as your head whips around and your body flies around inside the car.

Ligaments are very strong. Any torn ligament makes a joint unstable (loose.) There are different severities of ligament injury. Doctor, you can call them stretched, a partial tear or a complete tear. Stretched really means the same thing as a partial tear, so we are really dealing with a ligament that is either partially torn or completely torn.

A completely torn ligament is usually quite obvious on physical examination and the MRI films. It requires immediate surgery most of the time. The orthopedic surgeon re-attaches the torn part of the tendon or ligament to the bone by putting a screw through the tendon or ligament and screwing it into the bone to hold it. This type of surgery works in a shoulder or knee but not in the neck. There are so many ligaments holding your neck bones together that surgery is only necessary sometimes. The decision to fuse neck joints is usually made when the bones are "sliding" into the spinal cord or spinal nerves during certain neck movements.

A partially torn ligament is not as obvious and so it is often missed by doctors who are not trained in reading trauma MRI films or x-rays. MRI studies can miss them because part of the ligament is still attached to the bone. The MRI study is not detailed enough to be able to see when only *some* of the ligament fibers are torn. Partially torn ligaments sometimes need surgery (but not always.) Surgery to fuse your neck vertebra is a major surgery that leaves scars on your body, stiffness in your neck and has risks.

Because of these risks, patients often choose to live with their pain (and use pain management like chiropractors and/or drugs) rather than have neck surgery. There are, after all, *some* ligament fibers still intact that are still partially holding your bones together. Numerous studies show that a joint with a ligament partial tear will become

arthritic within just a few years. The arthritis is usually bad enough within seven years to be visible on a plain x-ray film.

Referring the patient to have Prolotherapy, PRP or Stem Cell injections is the most natural and least invasive way of healing torn tendons and ligaments. If those fail, surgery is the next option.

What a Partial Ligament Tear Feels Like

Ligament injuries in your neck often cause a *clunk* sound when you move your neck. This clunk is from the sliding of your joint (instead of the smooth glide it did before the ligament was torn.) Ligament partial tears cause two types of pain. The first is from the partially torn ligament fibers themselves. Ligaments have pain nerves in them so tearing ligament fibers is quite painful. It is a ligament that holds your tooth in place. Remember how painful it was when you were trying to "pull a baby tooth?" You were essentially tearing the ligament that was holding the bony tooth in place.

Tearing a ligament is very, very painful in the beginning and for several months after the accident. Even after the initial torn ligament pain subsides, the secondary type of pain is *referred ligament pain*. This type of pain pattern confuses many doctors and is still misunderstood even by some reasonably good doctors.

For example, injured neck ligaments *refer* pain to the shoulder on the side of the neck where the ligament is partially torn. You may feel the *referred ligament pain* in your shoulder (not your neck) so you may tell your doctor about your shoulder pain. The doctor examines your shoulder and finds nothing wrong with it and, naively, tells you there is nothing wrong with your shoulder. You are extremely frustrated because you know that your shoulder hurts and that there is something wrong. In this example, the doctor is wrong.

The doctor is incorrect to tell the patient, "There is nothing wrong." The doctor would be correct to tell the patient, "I cannot find the problem." Most doctors will not admit that they do not know enough to find the problem so they arrogantly tell you there is "nothing wrong with *you*."

Referred Ligament (Sclerogenic) Pain

Referred ligament pain *aches*. It does not follow the traditional nerve dermatome patterns. It is generally there all the time (unless you take medicine to stop the pain or get some chiropractic or physical therapy treatment to the aching area.) Referred ligament pain feels like a vague, deep, dull pain. One of the most reliable signs that your pain is a referred ligament pain is that the area feels better *temporarily* after you have had some physical therapy or chiropractic treatment to that area. This temporary relief lasts

only a few hours or as much as a day or two but *seldom longer than two days*. You are so happy just after the treatment because you feel a little (or a lot) better. Unfortunately, the pain always comes back within 48 hours.

Trapezius Pain vs. Ligament (Sclerogenic) Referred Pain

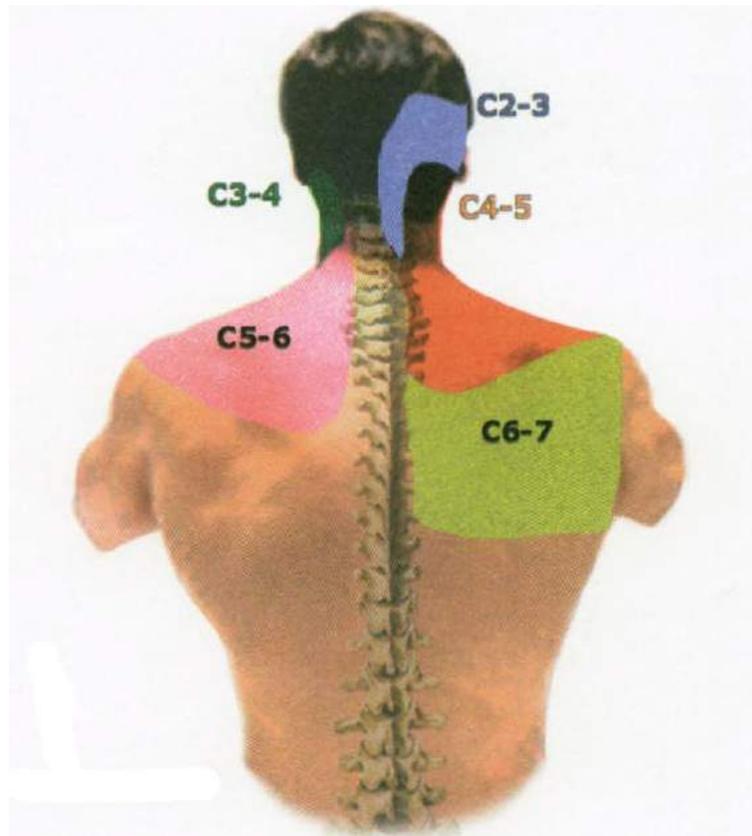
Chiropractors frequently misunderstand ligament sclerogenic referred pain. Torn C4-5 and torn C5-6 facet capsules caused aching in the middle trapezius. Chiropractors often “treat” the middle trapezius with muscle stimulation, ultrasound, massage or laser with a mistaken belief that the trapezius is the injured area. **If the trapezius pain is not completely gone in six weeks, the patient most likely has a torn facet capsule.**

Since the only relief the patient can get is by going to the chiropractor, they keep going for treatments to get the temporary relief for a day or two. The pattern is one of feeling some relief for a short time followed by a return to the pain at the same intensity as before. **There is no gradual improvement over time** as would be expected in normal healing. The patient hurts, the chiropractic treatment helps them feel better for a few hours or days and then the pain returns to the same level of intensity as before. This cycle continues for months or years after the accident.

This pattern is common where the chiropractor has failed to initially make the correct diagnosis of torn neck ligaments and thinks he or she can "fix" you. The correct course of action is for the doctor to accurately diagnose the patient in the beginning. The chiropractor can do you a lot of good for the first three or four months after the accident. After four months, move on to Prolotherapy, PRP or Stem Cell Injections.

Ligament Referred Pain Patterns

Doctors have mapped out the typical pain patterns from torn neck ligaments and they are very precise. If you have torn any ligaments in your neck, the most common areas for referred ligament pain are: (1) The back of your head; (2) the side of your neck; (3) the shoulder area where your neck attaches to your body; (4) the scapula (wing) area of your upper back; and (5) the middle back. The location of your referred pain depends on which of your neck ligaments is torn.



Torn Neck Ligament Referred Pain – Figure 1

Referred pain does not progressively improve. If the patient has an actual injury to their trapezius and you apply the proper conservative treatments, the patient should feel a little better the first month, even better the second month, and still better the third month (e.g. progressive improvement.) However, if the patient has referred pain as shown on this diagram, all the treatment in the world to the trapezius will not cause progressive improvement. The truth is that the doctor misdiagnosed the injuries and is treating the wrong thing.

Ligament partial tears in the neck cause sclerogenic referred pain in patterns originally mapped out by President John Kennedy's personal physician, Janet Travell, M.D. She called these "trigger points" in 1942 and pioneered the work that explains how pain can be triggered in an uninjured area of the body that really comes from an injured area. The pain pattern does not follow any neurological pattern and causes many doctors to be confused and believe that you have a shoulder injury from the accident when, in reality, you have pain that radiates from your injured neck ligaments to your neck, shoulders, upper back, and/or the back of your head.

The pain “triggered” in another area is a vague (non-specific) ache. As I stated before, it feels better for a few hours or days after getting a treatment by your chiropractor or physical therapist, but the pain comes back. Here is a chart explaining it in a different way:

Ligament Where You Feel Pain For This Injury

C2-3	Back of head, base of skull, central neck
C3-4	Side of neck
C4-5	Lower neck, shoulder (upper trapezius)
C5-6	Shoulder, upper and middle trapezius
C6-7	Shoulder blade, middle back

You should be able to do the tests necessary to determine where that pain is coming from. As I said before, good doctors do not give up until they find out what is wrong with the patient (or refer you to a specialist that can figure it out.)

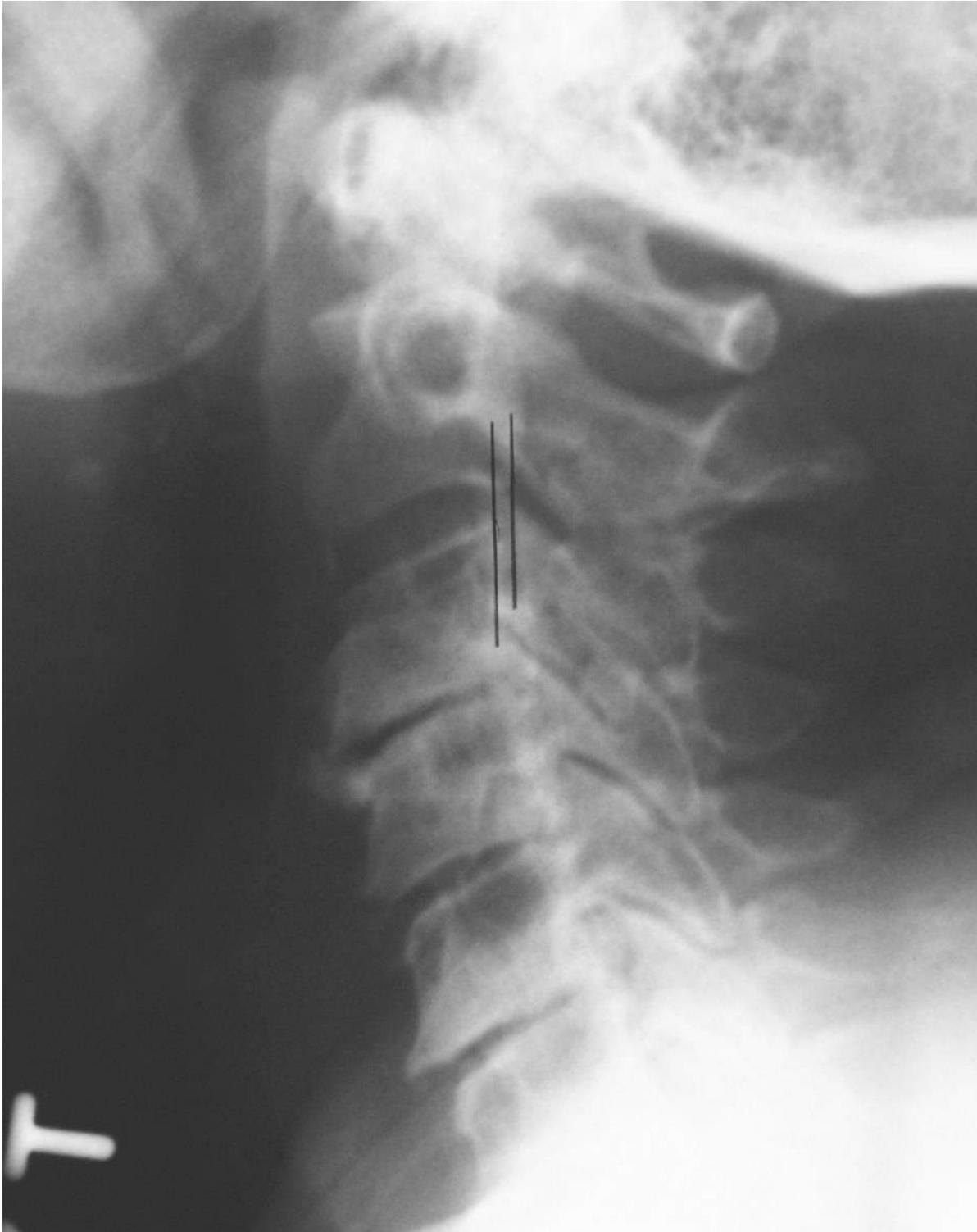
Newly Torn Ligaments or Old Torn Ligaments?

It is easy for any doctor to differentiate between *new* torn neck ligaments from your most recent car accident and *old* torn ligaments not caused by the recent car accident. Old torn ligaments heal by forming degenerative arthritis (DJD) in the joint where ligaments were torn. Where there is DJD, those joints were injured *before*, not this time.

The x-ray films on the next three pages illustrate exactly what happens when neck ligaments are torn.



Newly Torn Ligaments with Old DJD – Figure 1
72-year-old with DJD everywhere in her neck except
C2-3 where there is no DJD



Newly Torn Ligaments with Old DJD – Figure 2

This extension film demonstrates torn anterior longitudinal ligament allowing translation instability at C2-3



Newly Torn Ligaments with Old DJD – Figure 3

This flexion film demonstrates torn posterior ligaments allowing translation instability at C2-3

All of these x-ray films show significant degenerative arthritis in the middle and low neck vertebrae. C3-4 has severe DJD and C4-5, C5-6 and C6-7 all have moderate DJD. This was my patient so I know her history very well. She had two car accidents prior to the one that brought her into my office. They were twelve and seventeen years before. The DJD in her neck at all these levels is from those two prior rear end car accidents.

She was rear-ended again at the age of 72. I took these x-ray films and it was obvious that C4-7 had DJD from *old* injuries. It was just as obvious that C2-3 had a *new* injury. The posterior longitudinal ligament was torn in the new rear end car accident to a reasonable medical certainty. That joint has no arthritis at all but does have *translation* of those vertebrae on the flexion and extension x-ray films.

Why Arthritis Forms In Joints With Injured Ligaments

The x-ray films on the previous pages show what happens to a patient in a car accident who already has degenerative arthritis (aka degenerative joint disease or DJD) in his or her neck. There is no new tearing of ligaments in the joints of this patient's neck where DJD has already formed. There is no translation instability in those joints where DJD has already formed. Bone spurs have formed to stabilize those joints that were previously injured and the joints have begun to fuse together.

The torn ligaments in this 72-year-old patient occurred at the only joint in her neck which had no DJD before this car accident. C2-3 is a beautiful and clean joint at the time of this car accident. That means the injury demonstrated at the C2-3 joint in these x-ray films was absolutely and to a reasonable medical certainty a brand new injury from this new car accident. The joint has translation instability that is measureable on these flexion and extension x-ray films. I was able to show this picture to a claim adjuster and prove that the car accident had torn her C2-3 neck ligament.

The joints at C3-4, C4-5 and C5-6 were injured in previous car accidents, had torn ligaments at that time and have now healed by forming DJD in all those joints. These joints have moderate to severe DJD so the injuries to the C3-4, C4-5, C5-6 and C6-7 joints must have occurred between ten and twenty years before these x-ray films were taken based on the severity of the DJD. I know for a fact that her two prior car accidents were twelve and seventeen years before these x-ray films were taken. Mild DJD shows on x-ray films seven to ten years after the neck ligaments are torn. Moderate DJD is visible on x-ray films after about ten years and it gets worse over time. The progression of DJD depends on how severely the ligaments are torn and how much time has passed. Torn ligaments plus fifteen years usually looks like "severe" DJD on x-ray films.

This patient's arthritic neck joints are so stiff and fused together that they were not injured in the recent car accident. The forces of the accident moved up her neck to the only remaining arthritis-free joint and her ligaments were torn at the beautiful, non-

arthritic C2-3 joint. I can state with reasonable medical certainty that the torn ligaments observed on these stress x-ray films were caused by the patient's *recent* car accident. If these ligaments had been torn before this accident, there is absolutely no way that her joint would look this pristine, clean and arthritis-free.

Any joint with partially torn ligaments is loose, moves too much, and doctors often call this *translation*. Translation in a joint means that before the normal bending of the joint begins, the bones translate on each other, or *slide* back and forth before starting to bend. This is the *slide, not glide* mechanism I wrote about earlier.

Arthritis begins forming almost immediately and takes two or three years to really make the patient notice the stiffness in the injured joints. DJD gets bad so fast that it can be observed on an MRI film within about three years and visible on plain x-ray films within about seven years.

Muscle Guarding or Splinting is Caused by Torn Ligaments

The body tries to stabilize the injured joint for several years by causing your muscles to spasm until the arthritis can fully form the bone spurs and scar tissue that eventually stiffens up your neck joints permanently. Tight muscles will partially stabilize your joint. Unfortunately, muscle spasms themselves are painful so the patient may get treatment for them.

Suppose the patient has torn neck ligaments and secondary muscle spasms in the neck. They get a treatment from you, the chiropractor (massage, ultrasound, adjustment) and your treatment relieves the muscle pain and spasms for a few hours, days or even weeks. However, once the treatment loosens up your muscles, the vertebrae begin to translate and slide excessively every time the patient moves their neck.

The patient's body senses this again and causes their muscles to tighten up again with spasms. This is the vicious cycle of translation instability and secondary muscle spasms. Eventually, degenerative arthritis gets bad, the neck joints become very stiff as they fuse together and muscle spasms are not needed as much to stabilize the neck. The patient feels somewhat better after two or three years because the arthritis has stopped the vicious cycle of muscle spasms. Unfortunately, the arthritis makes their neck stiff all the time. Then they have to keep going to the chiropractor all the time for adjustments to help their stiff neck.

Degenerative arthritis is your body's attempt to tighten up the loose joint. When the arthritis is fully developed after the whiplash, you cannot turn, bend, or twist your neck as much as you could before the accident. Stiffness is the hallmark sign of degenerative arthritis in your neck joints.

Injured Neck Ligaments

There are twenty-two major ligaments in your neck. The first test to be done for injured neck ligaments is stress x-ray films. They are cost-effective and, when read properly by someone who knows what to look for, can quickly and easily find up to six of the most commonly injured neck ligaments. Doctors are taught that a Davis Series of neck x-rays should be done after trauma. Two of the films from the Davis Series (lateral flexion and lateral extension) will assess two of the neck ligaments, namely the posterior longitudinal ligament (PLL) and the anterior longitudinal ligament (ALL).

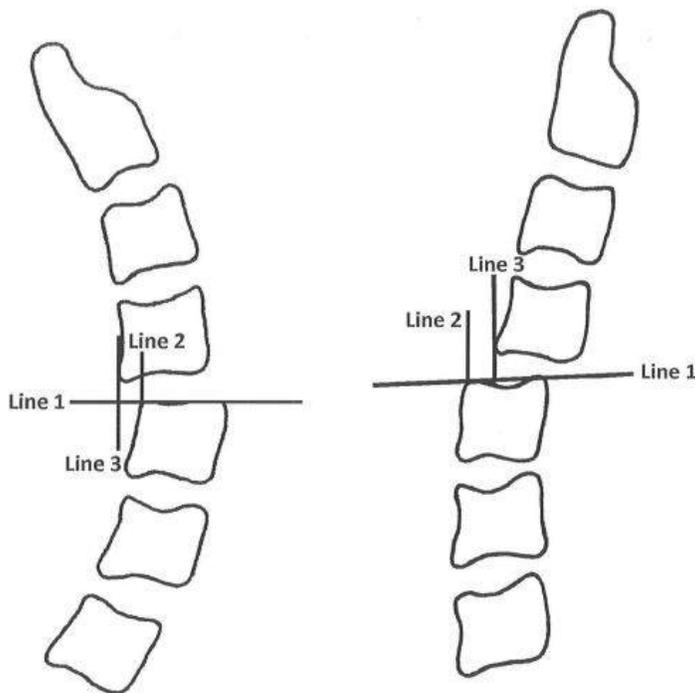


Figure 1: Extension Lateral

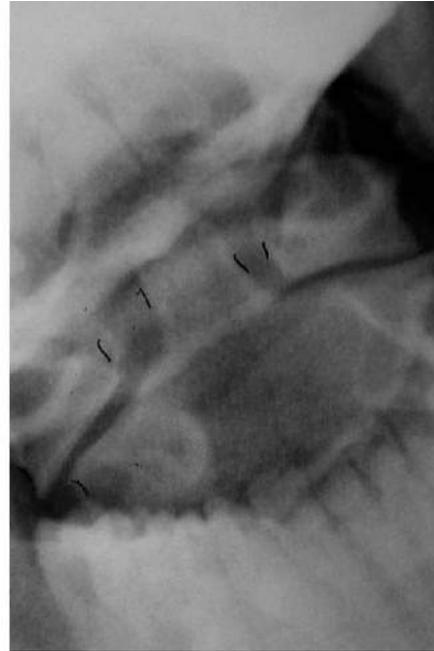
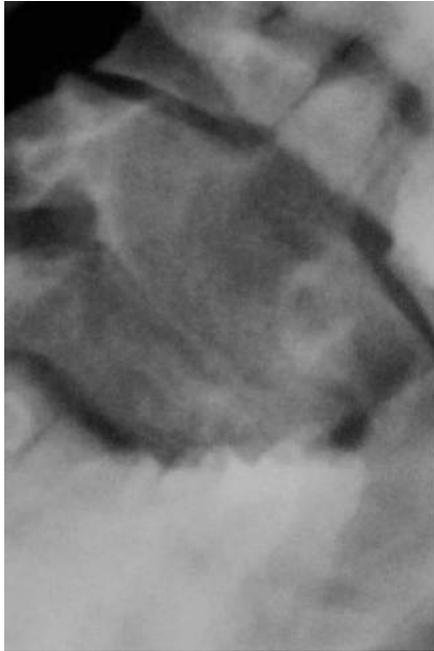
Figure 2: Flexion

Stress APOM X-Rays for Dizziness, Lightheadedness & Headaches

The Davis Series includes a film called the Anterior-Posterior Open Mouth (APOM) view. This film, however, is not a stress film and does not show injuries of the accessory and alar ligaments. **I recommend to them to replace this one neutral APOM film with two stress APOM films in certain trauma cases.**

When the patient has dizziness, lightheadedness, headaches or a woozy feeling when you move your neck into certain positions, I recommend the doctor take stress APOM x-ray films. Two APOM films are taken. One is taken with the head tilted sideways to the left and one with the head tilted sideways to the right. The cause of the patient's dizziness will sometimes be very obvious because the first and second vertebra *translate (slide)* way too much in relation to each other. The doctor will look for two things that indicate

partially torn alar and/or accessory ligaments in your neck: (1) Asymmetrical lateral Atlanto-Dental Interspace (ADI); and (2) the body of the first neck vertebra (C1) will slide sideways off the body of the second neck vertebra (C2) in one direction or the other.



Newly Torn Alar & Accessory Ligaments Stress APOM X-ray Films

If none of these six ligaments are damaged on the plain film x-rays, you can breathe a sigh of relief. Your patient is probably going to get completely well within two or three months and heal very well. However, if you find *any* of these six ligaments injured in the plain x-ray films, the next test that should be done is a Digital Motion X-ray (DMX) study. This test is sometimes called Video Fluoroscopy and it can test all twenty-two ligaments in your neck.

When the doctor looks at the plain x-ray films and finds *any* of the six ligaments partially torn, the DMX should be routinely ordered about six to twelve weeks after the accident to test your other sixteen neck ligaments. This is the only way to know what is really wrong with the patient.

I hope you enjoyed the seminar! Now take the exam and email your answers in a NUMBERED VERTICAL column to: marcusstrutzdc@gmail.com

Hope you take seminars from us in the future,
Thanks
Marcus Strutz, DC