Back To Chiropractic Continuing Education Seminars
Chiropractic Adjusting Online

Welcome: This course counts as 6 Hours of CE for the Chiropractic Board of Examiners for the state of California. Course must be completed by the end of your birthday month to count for CE.

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

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, just complete it before the above deadlines.

Directions:

1. **Read through the course material**
2. **Download the exam from: backtochiropractic.net**
3. **Complete exam and e-mail the answers to: marcusstrutzdc@gmail.com**
4. **75% or higher is required to pass, if you do not pass you must retake the course. (Yes that means paying again)**
5. **Upon passing, a Certificate will be e-mailed to you for your records. You DO NOT need to send the state board anything, I will always retain a record of your CE courses if you are audited and lost your records.**

Enjoy,
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Chiropractic Adjusting

BJ Palmer ~ 1881-1961 Last Printed Words

Time always has and always will perpetuate those methods which better serve mankind. Chiropractic is no exception to that rule. My illustrious father placed this trust in my keeping, to keep it pure and unsullied or defamed. I pass it on to you unstained, to protect as he would have you do. As he passed on, so will I. We admonish you to keep this principle and practice unadulterated and unmixed. Humanity needed then what he gave us. You need now what we give you. Out there in those great open spaces are multitudes seeking what you possess. The burdens are heavy; responsibilities are many; obligations are providential; but the satisfaction of traveling the populated highways and byways, relieving suffering and adding millions of years to lives of millions of suffering people, will bring forth satisfaction and glories with greater blessings than you think. Time is of the essence. May God flow from above-down his bounteous strengths, courage's and understanding to carry on; and may your innate's receive and act on that free flow of wisdom from above-down, inside-out…for you have in your possession a sacred trust. Guard it well.

How Well Educated Are We?

Chiropractic Education VS Medical Education

Chiropractors go through an immense amount of schooling to receive a "Doctor of Chiropractic" degree (also known as a D.C.). Their collegiate agenda is as follows:

- Graduate from a four year college.
- Completing at least two years undergraduate study, with a focus on the sciences.
- Four years of Chiropractic Education.
- Take mandatory internships.
- At least 900 hours of work in a Chiropractic Clinic.
- After graduating, pass written and oral board exams, at national and state levels.

A Chiropractor may opt to choose to advance their degree in an area of specialty. These areas include: Chiropractic neurology, radiology, sports medicine, as well as many other fields.

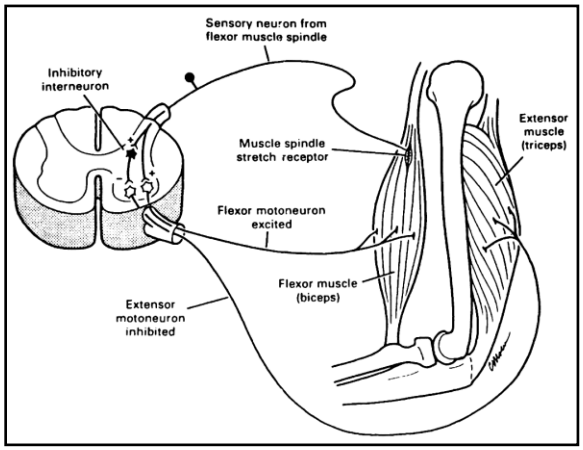
Chiropractic Class Hours	Subject	Medical Class Hours
520	Anatomy	508
420	Physiology	326
271	Pathology	335
300	Chemistry	325
114	Bacteriology	130
370	Diagnosis	374
320	Neurology	112
217	X-Ray	148
65	Psychiatry	144
65	Obstetrics & Gynecology	198
225	Orthopedics	156
2,887	TOTAL HOURS	2,756
Subjects related to their specialty.	Other required subjects for doctors of medicine/doctors of chiropractic	Subjects related to their specialty.
4,485	TOTAL CLASS HOURS	4,248

Preparing The Patient For The Adjustment

Key Thought: One of the most important things to do is "prepare" the patient for the adjustment.

1. Explain the physiology and benefits of the adjustment
2. Explain the audible
3. Relax the soft tissue (deep tissue work, PNF)

Proprioceptive Neuromuscular Facilitation Stretching



Proprioceptive Neuromuscular Facilitation Stretching Protocols

PNF Reciprocal Inhibition: Take muscle to be stretched to tension. Have patient contract antagonist muscle. This inhibits the agonist. Excellent for take home stretches.
Contract antagonist & hold stretch for 15-30 seconds or less based on patient tolerance/comfort.
Repeat 3-5x or less based on patient tolerance/comfort or need.
Allow 30-60 second rest between repetitions.

PNF Contract-Relax-Passive:
Contract agonist for 5-10 seconds.
Relax for 1-2 seconds, while patient takes a slow deep breath.
Passively stretch agonist & hold stretch for 15-30 seconds or less based on patient tolerance/comfort.
Repeat 3-5x or less based on patient tolerance/comfort or need.
Allow 30-60 second rest between repetitions.

PNF Contract-Relax-Contract Stretch:
Contract agonist for 5-10 secs.
Relax for 1-2 secs, pt takes a slow deep breath.
Contract antagonist & hold stretch for 15-30 secs or less based on pt tolerance/comfort.
Repeat 3-5x or less based on patient tolerance/comfort or need.
Allow 30-60 sec rest between repetitions.

Reciprocal Inhibition.

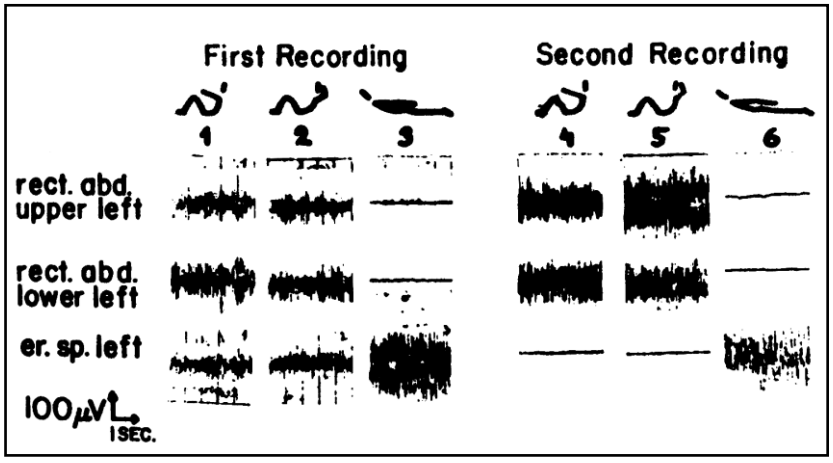
The Rules of Reciprocal Inhibition

1. Anterior muscles work opposite posterior muscles
2. Left lateral muscles work opposite right lateral muscles
3. Left rotation muscles work opposite right rotation muscles

The best way to remember this is the position of walking.
You can use these rules in a rehab situation or working out in the gym.

Cross Cord Training

If you hold an isometric contraction with the triceps, the biceps performance will improve 10-20%. Looking to the triceps side elicits the posterior tonic neck reflex, which will also improve performance.



EMG Before & After Stretching
Korr IM, Neurobiologic Mechanisms in Manipulative Therapy, 1978

Before Stretching
Above in "First Recording" in position 1 and 2 the abdominals are inhibited because the patient has short overly contracting low back muscles. Thus even when the patient contracts their abdominals the low back muscles DO NOT turn off completely. In position 3 the patient has overly contracting low back muscles.

Application 1: Before strengthening the abdominals the low back muscles should be stretched. Before strengthening the posterior thoracic cage muscles the pectoralis muscles should be stretched.

Application 2: Before adjusting the low back muscles should be "turned off" or at least dampened. Always have the patient contract the muscles you are about to adjust into first to help them relax

After Stretching
Above in "Second Recording" in position 4 and 5 the abdominals are now functioning normally because the patient has normalized the low back muscles.

Big Idea: The more we can get the patients muscles to relax BEFORE the adjustment the easier the adjustment will be and the better the results.

Try This:
1. Sit on the floor.
2. Extend your legs and try touching your toes.
3. Now take a long slow deep breath and try to touch your toes again. You should stretch easier.
4. Now contract your calf muscles for 2-5 seconds. Take a long slow deep breath and try to touch your toes again. You should stretch easier.
5. Now contract your quad muscles for 2-5 seconds, and then contract your calf muscles for 2-5 seconds. Take a long slow deep breath and try to touch your toes again. You should stretch easier.

As you can tell these procedures instantly relax the muscle. Now we have a tool to apply this to all of our adjustments. And it only takes 2-5 seconds.

Best Results: Strengthening
1. Always stretch the agonist & antagonist before strengthening.
    Ex 1: If strengthening the upper back muscles, first stretch the chest muscles & then the upper back muscles to optimize muscle firing.
    Ex 2: If strengthening the abdominals, first stretch the low back muscles & then the abdominals to optimize muscle firing.

Best Results: Stretching
1. Always contract the antagonist & then the agonist muscle before stretching.
2. or simply contract the agonist muscle & then stretch.
    Ex 1: If stretching the hamstrings, contract the quads & then the hamstrings, then go into the stretch.
    Ex 2: If stretching the calves, dorsi-flex your foot & then plantar-flex your foot, then stretch the calves.

Stretching Images Pre-Adjusting

All stretches should be done with a big breath and held for 15-30 seconds

Lateral Flexion

Neck Extension Stretch

Fulcrum neck over fingers of all vertebrae. Stretches anterior tissues & mobilizes the neck.

Right Lateral Flexion

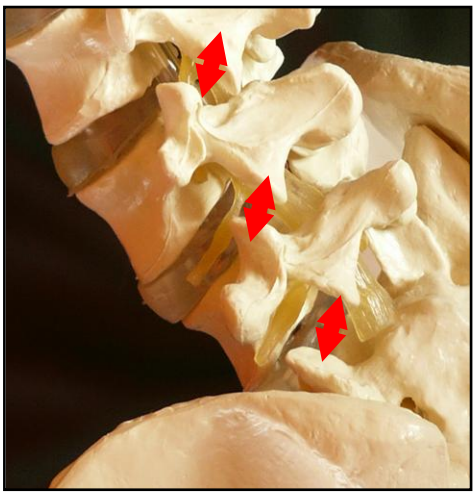
Left Lateral Flexion

Right Neck Rotation

Left Neck Rotation

Low Back Seated Stretches ~ Pt is seated, joints are jammed

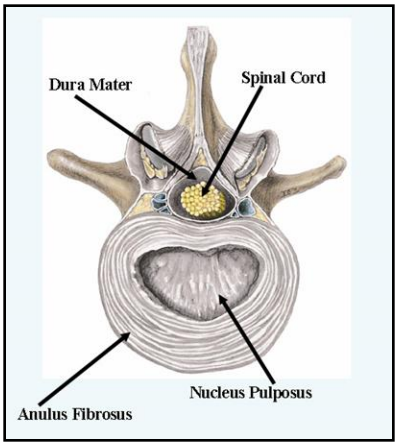
Low Back Side Stretch ~ Pt is on their side & rotated, the joints open.

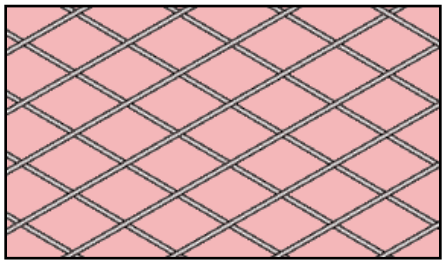


Bad Stretching

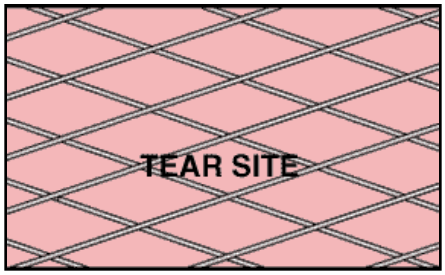
Bad stretching position.
No isolation & leaning over is always hard work for the back.

Demonstration: Take two rubber bands of different thicknesses and loop them together. The thicker band is the tighter muscle. As you pull the bands apart the thicker band will stretch the least. This is why we must isolate each muscle group as we stretch.





Annular Fibers: Relaxed



Annular Fibers: Under Stress

The annular fibers are at a 30° angle, as you lean forward & rotate only half the fibers hold, making them susceptible to injury.

Note: Patients have all learned in high school or the gym to stretch with standing toe touches and/or "windmill" bending & twisting motions. We must confront and change these misconceptions.

Stretching Images Pre-Adjusting

Shoulder Traction While Lying Down

Traction move for frozen shoulder.

Shoulder ~ Pendulum Exercises
Allow arm to dangle & have pt move shoulder through all ROM's or spell the alphabet. Great for frozen shoulders.

Shoulder & Scapular Stretch

Chest Stretch ~ Lean through doorway supporting your body. Great stretch for pec major & pec minor, allowing for better breathing.

PMS Cramping - Works great for cramps. Cross stretch held at 45 degrees, no thrust. Add a hot pack across the cramping region. Adjust after stretching.

Soft Tissue ~ TMJ

Using thumb in a downward motion, work thru the adhesions in the SCM & scalenes

Using thumb in a downward motion, work thru the adhesions in the masseter muscle.

The idea is to break up the adhesions & cause inflammation;
thus starting the healing process in the muscle.

Soft Tissue - Forearm
For most wrist, elbow & forearm conditions, deep adhesions have formed & need to be broken up. This is aggressive & the pt will be sore afterwards. No ice, we want the inflammation and fluid flow.

Wrist - Radial/Ulnar Sheath Shimmy
The sheath between the ulna & radius can also form adhesions. Aggressively shaking the bones up & down will assist in mobilizing the tissue.

Wrist - Open Hand Stretches
Great stretch for flexor muscles & tendons. Hand is splayed on wall with shoulders perpendicular to wall. Rotate head away to help stretch neck as well.

Popliteus Release

Working the popliteus muscle behind the knee can give relief for radiating pain & locking knees.

Soft Tissue - Calves Calf adhesions can be broken up using thumbs or forearm. Always push toward the heart.

Calf - Stretch: Dorsiflexion while raising your bottom off the table & pulling your toes toward your body will stretch the calf.

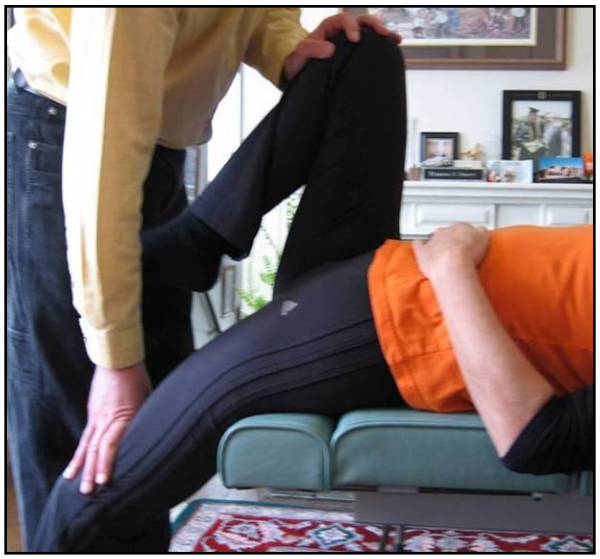
Feet - Stretching
Squatting on toe tips can provide a stretch for the plantar fascia.

Soft Tissue - Feet
For Plantar fasciitis dig aggressively through the bottom of the foot with a tennis ball. This breaks up adhesions & causes inflammation helping the tissue heal. No ice afterwards.

Soft Tissue - Feet
For Plantar fasciitis dig aggressively through the bottom of the foot. This breaks up adhesions & causes inflammation, helping the tissue heal. No ice afterwards.

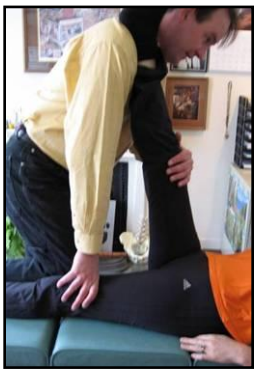
Iliopsoas Stretch: Various positions to perform the iliopsoas stretch. Use PNF protocol, works well with many low back cases.

Iliopsoas Stretch: Stretch done off the side or end of the table.



Quad Hip Flexor Stretch: Lean back to stretch quadriceps.

Hamstring Stretch: Use PNF protocol to stretch the hamstrings. Works well in cases with radiating pain.



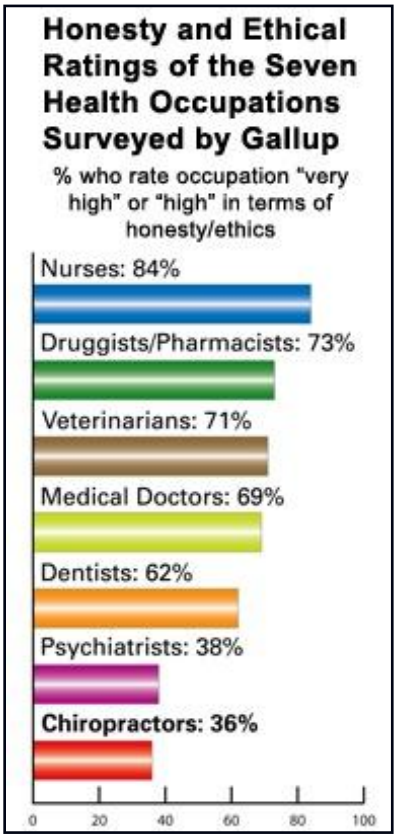
Chiropractic Adjusting

Big Idea: As a profession we must be able to explain chiropractic and the benefits of chiropractic care, as the public has little to no idea what we do.

What Is The Public Perception?

Chiropractors perform many exams that pts have not seen, be sure to explain as you go! (**verbalize** your routine spinal assessment ~ AK, leg checks, palpation etc)

62% of US adults used complementary & alternative medicine CDC National Health Statistics, 2004
24.4% prayer by other's for one's own health, 18.9% natural products, 11.6% deep breathing exercises, 7.6% meditation, **7.5% chiropractic care**, 5.1% yoga, 5.0% massage, 3.5% diet-based therapies



college teachers 58%
clergy 58%
policemen 54%
journalists 26%
business executives 18%
lawyers 18%
stockbrokers 17%
senators 15%
insurance salesmen 13%
HMO managers 12%
car salesmen 7%
Gallup poll 1,009 US adults, Dec 2006

Survey Says: They Love Us For Back Pain 88% who tried chiropractic said it helped a lot!
Completely or very satisfied:
Chiropractor 59%
Physical Therapist 55%
Acupuncturist 53%
Physician, specialist 44%
Physician, primary-care doctor 34%
Asked to rate satisfaction on a 10 point scale, 87% gave chiropractic an 8 or higher.
56% rated their chiropractor with a perfect 10.
Consumer Reports ~ May 2009

Subluxation:
1. Myopathophysiology 2. Neuropathophysiology 3. Kinesiopathophysiology
4. Histochemical Changes 5. Pathophysiology

Subluxation Not Defined The original chiropractic hypothesis was: "subluxation is the cause of dis-ease." Modern day chiropractic associations have expanded this statement for the public, but in reality this remains the backbone of chiropractic education & practice to this day. "Subluxation" has never been defined by chiropractors to have universal acceptance within the profession. National Association Chiropractic Medicine

Patient Education: (public has no idea what we are selling)

How Many Visits Does It Take To Shift The Patient's Paradigm?

Give the patient choices. Most come in with pain, so this needs to be addressed first.
Below is an example of care options

Chiropractic... Choosing The Right Type Of Care For You

Choosing the type of care that fits your needs at this point in your life is one of the most important decisions you can make. Your health is your responsibility and I am excited to serve you however you see fit.
My main goal is to help you to make educated choices in regard to the different types of health care available in the office. There are three types of care:
* Do Nothing Right Now
* Relief/Band-Aid Care
* Life Enhancement/Corrective Care

Do Nothing Right Now
Although "Do Nothing At All Now Care" reflects a "save it for a rainy day" attitude, most people understand that the problem will most likely get worse with time. Maybe the symptoms will go away, but the underlying problem still needs to be addressed. I trust that you received important information about your body and your health for future decisions.

Relief/Band-Aid Care
This type of care is designed for people who want to focus only on relieving immediate symptoms. This is similar to taking an aspirin for low back pain. The pain may temporarily go away but it does nothing to address the underlying cause.
Ignoring the cause often leads to more serious problems. In the same way, pressure on the spine and the nervous system can alter physical and chemical structures, possibly leading to dysfunction and degeneration of the soft tissue, nerves, muscles, ligaments, disc and bone. The problem will most likely return again and again, often becoming worse. I am glad to address relief for your immediate symptoms and I will be here for you if you choose to later address and correct the underlying problems.

Life Enhancement/Corrective Care
Life Enhancement/Corrective Care is what Chiropractic is really all about. This care helps you get the most out of your body for the rest of your life. It goes beyond providing immediate relief and addresses the underlying cause of your problem. Correcting vertebral subluxations, removes the interference in your spine and allows the nervous system to function properly, thus realizing the highest level of health. This level of care is designed to bring about stabilization and healing.
This process takes Time, Repetition and Energy. Once your nervous system has started the healing process and functions closer to 100%, it pays you back many times over. You may than develop a stronger immune system, higher energy levels, better sleep patterns, clearer mental focus and a higher quality of Life.
My goal is to give you the information and support to make an informed decision about your health care.
The choice is yours.

Demonstrations: Try these

Patient Education ~ Subjective Range of Motion: Neck
Have your pt go through all 6 neck motions. Ask them if they move symmetrically, smooth, with no obstructions or pain. Let the pt know that all chiropractors want to get adjusted even when they pass all these tests! Why? Maintain or improve proper motion & prevent pain!

Patient Education ~ Subjective Range of Motion: Low Back
Have pt go through all 6 low back motions. Ask them if they move symmetrically, smooth, with no obstructions or pain. Let the pt know that all chiropractors want to get adjusted even when they pass all these tests! Why? Maintain or improve proper motion & prevent pain!

Patient Education ~ Respiration
Have your pt sit-up straight & breathe. Then have them hunch over & breathe. Ask them the difference - it's obvious. Let them know chiropractic helps maintain proper breathing through better posture & explain the importance of oxygen. You can also perform a pre/post adjustment breathing test, or use a spirometer.

Patient Education ~ Cardiovascular System
Have your pt hunch over. Ask them if this position compresses their heart. Ask if this increases their blood pressure. Ask if this high blood pressure is good or bad. Let them know chiropractic helps maintain proper cardiovascular function through better posture & decreased blood pressure. You can also perform a pre/post blood pressure exam.

Patient Education ~ Blood Flow
Squeeze your forearm & let go. Ask the pt why the skin turns white. Ask your pt what they think happens when their muscles are tight. That's right - decreased blood flow.

Posture is #1 Posture affects & moderates: spinal pain, headache**,** mood, blood pressure, pulse**,** respiration, sympathetic function**,** homeostasis**,** autonomic regulation, breathing**,** hormone production.
American Journal of Pain Management, 1994

Sit-up Straight! Loss of proper joint structure & function (due to poor posture) ⇑ adhesion formation in spinal soft tissue. Grieve, Common Vertebral Jt Problems, 1988

Don't Believe Me? Take A Look Have your pts observe the posture of people over 50.
Typically people with good posture appear healthy & people with bad posture look ill.

Patient Education ~ AK Posture Check Better nerve function ~ Stand up straight & put your arm out at 90° to your side then have someone push down on it. It should be strong. Now slump over (anterior head translation & flexion) with bad posture & push down again, your arm should be weak. Your brain communicates with your body via the spinal cord - with bad posture it shuts off not only your shoulder muscle and causes your vital organs to function poorly. With chiropractic adjustments you can maintain your posture, allowing your nervous system to function at a higher level, which includes your immune system.

Patient Education Question: Why Don't You Die When You Sleep? Autonomic Nervous System

Patient Education ~ Combo Example Have your pt roll their shoulders forward & have anterior head translation. Then attempt posterior head translation, they can't! This demonstrates the combination effect of how bad posture shuts down both the respiratory, cardiovascular & nervous systems.

Myth Buster ~ I don't need a Chiropractor, my pain is gone. Pain is often the first thing to go in the healing process; think broken arm. Cancer can develop for 7 yrs before you're aware of symptoms. If you're feeling good couldn't you feel even better? Think dental care, oil change & proactive health!

Patient Education ~ Pain Relief Decrease pain ~ Grab your wrist again, this lack of blood flow is due to constriction. As muscles & joints become tight they trap inflammatory chemicals causing pain & more constriction. In 5 days adhesions begin to form, causing more tightness & more trapped chemicals - chiropractic adjustments let muscles & joints move freely allowing these chemicals to be pumped out while healthy new chemicals flow in.

Patient Education: Sprained Ankle Patients often have a hard time understanding a sprained low back or neck, so use a sprained ankle as an example. Remember they think these 2 things are different.

Patient Education ~ Urinary Bladder Analogy Think about your urinary bladder for a moment. If you DON'T have to pee, is there urine in your bladder? Probably, but just not enough to give you that urge. This is true for inflammatory chemicals in your muscles as well. Your tissue always has some build-up of chemicals, but often not enough to cause pain or muscle tightness. To prevent excessive build-up, maintain proper fluid flow with an adjustment.

Pt Education: It may hurt!
Inform pt after an adjustment they may be sore regardless of the stage of healing. This can last 1-3 days & is NORMAL. Why? During the acute stage due to ⇑ inflammation, during the chronic stage by releasing trapped chemicals & starting new inflammation. This chemical flow (old-out, new-in) is essential for tissue healing. If you don't explain this, pts will leave thinking you hurt them.

No Frankenstein! Watch for patients guarding after an adjustment as they may think "it will go back out"! Don't "freeze" the body after an adjustment. Our goal is to: increase or maintain motion

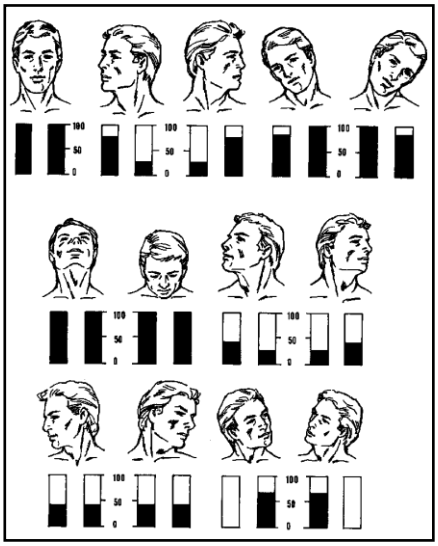
Patient Education ~ Repetitive Micro-trauma Demonstrations Low Back Tension Have your pt palpate your low back with a wide open hand as you pretend to: drive, cook brush your teeth, use a mouse, lift a trash can, mop, etc. They will feel the tension. Then ask them how long and often they do the various "activities of daily living". Probably for years and this build-up of tension IS the cause of their low back problems.

Patient Education ~ Repetitive Micro-trauma Demonstrations Trapezius Tension Have your pt palpate your traps as you pretend to: drive, cook, brush your teeth, use a mouse, read, etc. They will feel the tension. Then ask them how long and often they do the various "activities of daily living". Probably for years and this build-up of tension IS the cause of their neck and shoulder problems.

Patient Education 10 lb demo. Fact: the average head weighs 10-12 lbs. For every inch of anterior translation your muscles hold an additional 10-12 lbs. **Demo:** have your pt palpate your bicep as you move the weight from over your shoulder to our in front of you. The bicep will go from loose to tight. This is the same as the trapezius muscle which holds your head upright all day.

Myth Buster ~ I can crack my own spine so I don't need to go? When you self adjust you're moving the joints that are easy to move or hypermobile. Typically you aren't adjusting the correct joint, it feels good for a moment (endorphins release & muscles relax) but you'll have to repeat the process multiple times in a day. **Fact:** DC's choose to get adjusted by another DC instead of doing it themselves. Also how many DC's can adjust their own T2 or atlas? Probably none.

Stroke Risk Rotational manipulation of the upper cervical spine is most likely to cause a stroke.



Vertebral Artery Obstruction
Lateral flexion, flexion & extension maintain patency best.
Avoid rotating the nose away from the midline, as this decreases vertebral artery patency.

What are the risks of neck adjustments?
The risk of death due to stroke caused by cervical spinal manipulation is 1 per 4 million.
40-50 strokes occur in the US per year & a dozen deaths.

Is It Safe? Canadian Medical Association Journal, 2001
The likelihood that a chiropractor will be made aware of an arterial dissection following cervical manipulation:
1 in 8.06 million office visits
1 in 5.85 million cervical manipulations
1 in 1430 chiropractic practice years
1 in 48 chiropractic practice careers
This is significantly less than the estimates of 1 in 500,000-1 million cervical manipulations calculated from surveys of neurologists.

What Insurance Companies Say 20 strokes per 43,000,000 office visits or one stroke per 2.15 million cervical manipulations. NCMIC 1994

What are the risks? The increased risk of VBA stroke associated with chiropractic & PCP visits is likely due to pts with headache & neck pain from VBA dissection seeking care before their stroke. There is no evidence of excess risk of VBA stroke associated with chiropractic care when compared to primary care. Spine 2008

Risky Business
30% ADE in hospitalized pts
.00002 - .00008% Death due to lightening in US
.00001 - .00003% Serious neural complications due to cervical adjustment
Cauda equina lumbar SM 1 in 100,000,000
Death plane crash 425 miles 1 in 4,000,000
Death MVA driving 14.5 miles 1 in 4,000,000
Stroke/serious neurological injury from CSM
1 in 1-5,000,000Tx 1 in 100,000 Pts

Cause of Death Lifetime Odds

Heart Disease	1-in-5
Cancer	1-in-7
Stroke	1-in-23
Accidental Injury	1-in-36
Motor Vehicle Accident	1-in-100
Falling Down	1-in-246
Assault by Firearm	1-in-325
Drowning	1-in-8,942
Air Travel Accident	1-in-20,000
Legal Execution	1-in-58,618
Venomous Bite or Sting	1-in-100,000
Fireworks	1-in-615,488

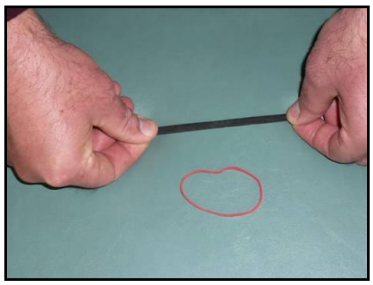
Risk	**Risk of Death/Person/Year**
Struck by car	1-in-20,000
Tornado (Midwest)	1-in-455,000
Earthquake (California)	1-in-588,000
Nuclear power plant	1-in-10 million
Meteorite	1-in-100 billion

If you adjust 100 pts/wk or 5000/yr, it would take 80 practice years (using 1 in 400,000) to cause a stroke & 800 practice years (using 1 in 4 million) to cause a single death.
This is why chiropractic malpractice insurance is so low.

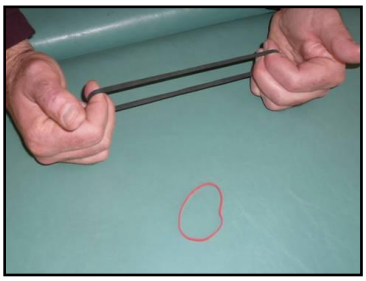
Blood Flow & The Adjustment Cerebellar hypoperfusion may occur after an adjustment, explaining why certain people experience headache, dizziness or nausea. Erik Barbaix, MD; Rudi Dierckx, MD, PhD

Tissue Properties of The Joint Complex

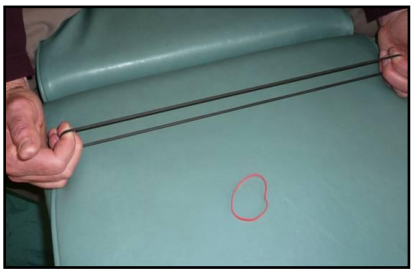
Rubber Band Demonstration



Relaxed, no tension



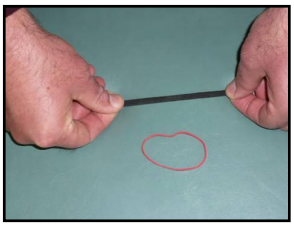
Normal tension



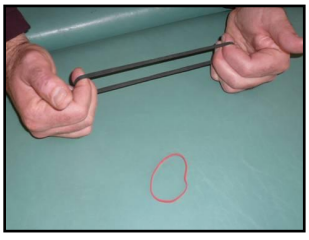
Excessive tension, band will fatigue & become lax

Elasticity: the springiness or resilient property of a tissue that causes it to resist deformation by recovering the original shape & size without permanent deformation.
Ask your patient what happens when you pull the rubber band apart and let go once vs 1,000 times.

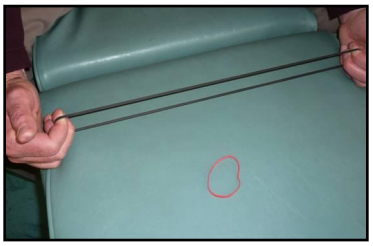
Plasticity is the property of a tissue that allows it to maintain elastic properties, but is not able to return to its' normal length. Permanent deformation has occurred.



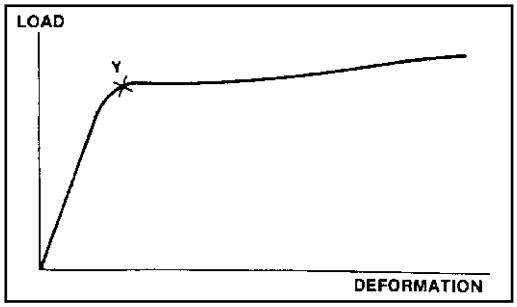
Neutral Zone



Elastic Zone

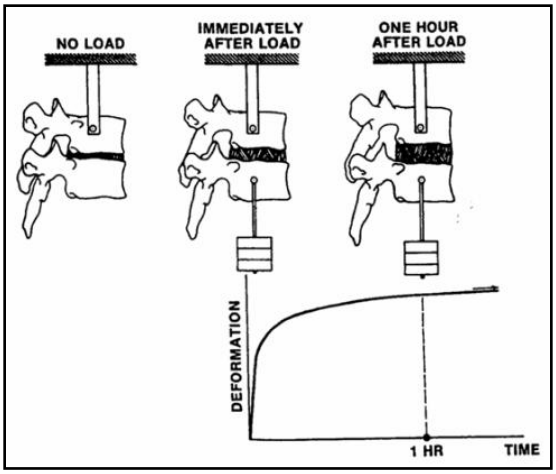


Plastic Zone



Yield Stress the point where the curve becomes nearly horizontal, after that the damage is permanent (plastic deformation).

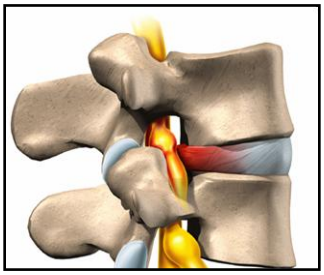
Tension elongates tissue. When a rubber band is stretched, tension is applied. When the spine is flexed, ligaments & muscles posterior to the instantaneous axis of rotation are under tension.



Viscoelasticity is a time dependent property of tissue sensitive to loading rate. All tissues (bone, ligaments, discs, tendons & passive muscles) have a loading rate where a slow, gradual pull will produce considerable deformation before fracture. **Great for pt education as they can easily see with time that the tissue will lengthen and endure stress.**

Fatigue occurs when tissue is subjected to repetitive cycles. Use the Sidewalk Analogy.

I was lifting the couch and…. Logic will prevail. If you lift a couch 100 times & your back goes "out" once, then it can't be from lifting the couch - it would happen every time. Also your friend would have been hurt. So what did happen? The tissue in your back was slowly fatiguing from all of your activities & then the tissue gave way. It's the old "straw that broke the camel's back". Also when they bent over to "tie their shoe" and they injured their back, remember that if this were the sole cause, then they would injure their back every time they laced their shoes.



Compression is a force that pushes tissues together.
The disc is the main compression-carrying component of the spine.

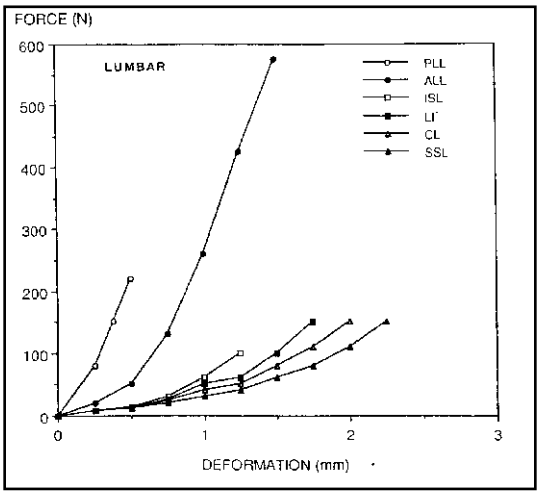
Patient Education: Water Balloons Pretend the water balloon is the disc or joint capsule. As it inflames it will restrict motion & ⇑ pressure on all surrounding structures, including nerves. The soft tissue will then constrict ⇓ motion. A chiropractic adjustment is an excellent way to ⇓ the inflammation.

Patient Education: The Sponge
A dried-up & wet sponge are good examples of fluid flow & dehydration of the disc. Have the pt push on the dry sponge, then the wet one.

Big Idea: Why do we get shorter as we get older? Disc dehydration is the major factor.

Imbibition for the Discs Swaying back & forth is great to prevent back stiffness & pumps the discs.

Myth Buster ~ My back is out, can't you just put it in? NO!
Backs *DO NOT* go in & out. Chiropractors don't realign the spine, we increase the range-of-motion. An x-ray would show your spine in the exact same place before & after an adjustment. Why? The spine is held together with strong ligaments - without them you could easily become paralyzed by a simple fall. Chiropractors adjust "stuck" joints - which allows them to move through a free range-of-motion.



Force-deformation curve of the spinal ligaments
Forces exerted during an adjustment, (short duration) are not sufficient to cause a change in the viscoelastic component of the ligaments. To do this requires sustained forces: muscle tone, gravity or traction.

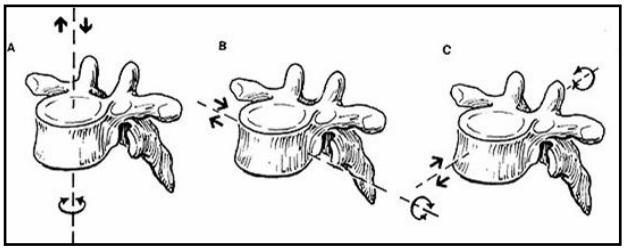
The closer a ligament is to the axis of rotation (PLL, ALL) the less elastin fibers it has. The supra-spinous ligament is the most elastic as it is the furthest from the axis of rotation

Are All Ligaments Created Equal?
Big Idea: Not all ligaments have the same elastic properties, as different ligaments have different functions.

NFL Players X-rays are identical before & after games!

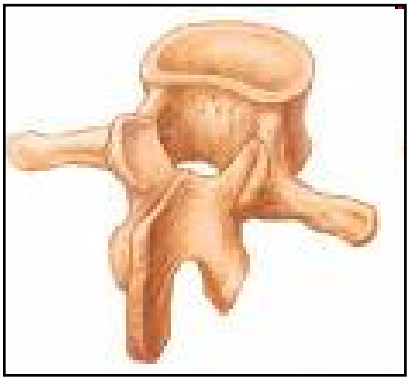
Bend Your Finger & Then Let Go, Does It Stay Misaligned? Why Not?

Examples of Axis of Rotation



How Long Does It Take To Lengthen A Ligament? Or For You To Do The Splits?
Or to straighten your teeth?

Motion Studies Why are motion studies performed after a MVA? Because even with macro-trauma the bones are not pushed out of place.



Motion vs Realignment Are we moving the bone?
If we adjust this vertebra to the right what happens?
1. It stays to the right
2. It goes to neutral, (realigned)
3. It returns to where it started

It depends on what's causing the misalignment:
1. Shortened ligaments 2. Chronic muscle contraction
3. Inflammation 4. Acute muscle contraction 5. All four
* Pathologies can also cause the misalignment

If the misalignment is only caused by shortened ligaments, then the vertebra will return to the original position due to the viscoelastic properties of the ligaments. It takes a sustained adjustment (traction) to change the length of ligaments, according to the Harrison's research 20 mins/day for 3 months. An example of this is scoliosis.
If the misalignment is caused by a chronic muscle contraction, then the vertebra is less likely to return to normal as the muscle will have adhesions in & around it. The ligaments probably have shortened.

If the misalignment is caused by acute inflammation (swollen disc, joint capsule, muscles, etc.) the vertebra can return to a neutral position once the swelling is gone.

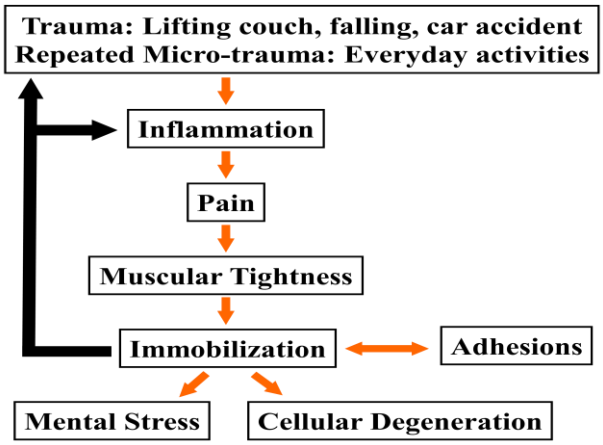
If the misalignment is caused by an acute muscle contraction, then the vertebra can return to a neutral position & be "realigned". A good example of this is acute torticollis. The pt is obviously misaligned due to the sudden onset of a muscular spasm. Once that muscle relaxes then the neck realigns.

Acute Muscle Spasm Protocol Acute Torticollis
1. History, X-ray & exam to rule out fracture & torn tissue (make sure it is a muscle spasm only)
2. O'Donoghue's Test to DDX muscle vs ligament, also to calm pt down
3. Ice, spray & stretch, ischemic compression on attachment site away from pain
4. PNF stretching
5. Adjustment (don't miss)

Upper Cervical Techniques? We can see realignments on upper cervical films because the tissue is often in acute spasm. The upper cervical ligaments are more elastic than the rest of the spine due to a higher concentration of elastin fibers. They are designed to allow more motion relative to the rest of the spine.

Unstable Spondy? In this case we have lax ligaments that allow the vertebra to shift and a non-ossified pars defect. Muscles can easily go into spasm causing pain & other symptoms. This vertebra will move on film, similar to a flexion-extension x-ray study of a whiplash pt.

Physiological Response To A Chiropractic Adjustment



Benefits of Chiropractic in Asymptomatic Pts
Studies reported improvements in neurocognitive function, visual field blind spot analysis, visual acuity, salivary cortisol levels, muscle strength & savings in health care costs.

Improved: ROM, muscle strength, surface EMG, immune response, endorphin levels, BP, heart rate & spirometry.

Significant changes: agility, balance, kinesthetic perception, power & speed reaction in asymptomatic athletes.

Benefits of Chiropractic in Patients with Symptoms or Pathology
Studies found: Journal of Vertebral Subluxation Research, April 2004

- ⇑ in immunoglobulins
- ⇑ CD4 cell counts in HIV+ subjects
- ⇓ triglyceride levels
- ⇓ BP
- improved cardiac function
- remission of duodenal ulcers confirmed by endoscopy

Big Idea: Your condition is common but NOT normal. Normal is NOT common.

Myth Busters ~ Once you go, do you have to go forever? NO! ~ Only as long as you want the benefits of Chiropractic. Analogies: exercise, diet, dental care, tune-up your car. Chiropractic isn't just about eliminating symptoms, it's about maintaining health.

Patient Education: Water Balloons & Wellness Care
Get 3 balloons: one green, one yellow, one red. Add water to each making the green the smallest, the yellow the middle size and the red the largest. Explanation:

Green: Tissue is normal, relaxed & no swelling.
Yellow: Inflammation has gathered, but not enough to cause pain.
This is where maintenance care comes in, to prevent excess chemical build-up.
Red: Excess build-up of chemicals.
Inflammation is so bad that it causes pain.
Put your phone number on the red balloon as this is when most people call.

Hypomobility results in degenerative changes & adhesions around the facet joints.
Adjusting gaps the joint & breaks up adhesions, re-establishing joint motion. JMPT, 2004

Fibrin deposits result in chronic inflammatory conditions. Spine, 1987
Scattered toothpicks are a simple example of the pattern of adhesion formation.
Shrink wrap around a joint or muscle is another simple explanation.
Spider web wrapping around a joint or muscle is another simple explanation.

Myth Buster Isn't that "popping" sound bad? Synovial fluid in your jts contains oxygen, nitrogen & carbon dioxide. When you adjust a jt you stretch the jt capsule, ⇑ the volume by 15-20%. This creates a partial vacuum & the gas rapidly releases due to the pressure change. (Boyle's Law, 1662) The gas is about 80% carbon dioxide & takes about 20 mins to return to the synovial fluid. There are no studies that suggest "cracking" your knuckles will cause arthritis.

Watch Your Language! Patients easily get confused if we say: "I got it", "it moved", "it's in". All these imply that the bone moved from here to there. Remember we have put motion into the segment, so it can now go through a more complete range of motion. And even though we moved the bone for a moment it has not moved to a new location.

The Missed Adjustment Pts feel like you failed if the joint was not gapped far enough to cavitate. Not only did they not hear the "pop" they also did not get their free high from endorphins being released. Let them know the joint still "moved", increasing the joint range of motion & muscles did relax. Typically a simple active ROM exam will demonstrate this. Also remember when we use drop or activator we do not get a "pop" but they both still work.

Critical Factor: Speed A fast stretch of sufficient speed fires GTOs inhibiting alpha motor neurons ipsilaterally. Insufficient speed fires low threshold muscle spindles resulting in excited alpha motor neurons, perpetuating ⇑ muscle tone.

Cavitation, activator & drop table all add enough speed to result in high threshold GTO discharge.
Dan Murphy, DC, DABCO AM J of Clin Chiro, 1997

Speed Drills! Using your drop table, simply pop it up & thrust quickly to simulate an adjustment.
Do 10-20 a day with your left & right hand.

Osseous vs Activator

Factors	Osseous	Activator
Speed		✓
Gapping of Jt	✓	
Specificity		✓
Pt Comfort		✓
Adhesions Broken	✓	
Muscles Inhibited	✓	
Safety		✓
Ease on DCs Body		✓
Hardest To Do	✓	

Benefits of Chiropractic Adjustments Malik Slosberg DC
1. Restore motion - both symmetry & ROM
2. Normalize biomechanics & load distribution
3. Pump out waste products & edematous fluid
4. Improves nutrition to discs & articular cartilage
5. Relax tight muscles
6. Normalize proprioception - position sense & kinesthesia
7. Stimulate sensory - motor reflexes which improve dynamic muscular stabilization of joints
8. Accelerate healing - as movement:
A. ⇑ metabolic rate
B. ⇑ collagen & protein production
9. Improves the alignment of new connective tissue

Negative Effects of Immobilization-Deconditioning Syndrome Craig Liebenson, JMPT 1992
Begins as soon as 4 hours of immobilization Chiropractic helps reverse all of these processes:

Muscle Weakness	**Muscle Incoordination**
⇓ flexibility	⇓ oxidative potential
⇓ muscle mass	⇓ cross-sectional area
⇓ mitochondrial content	⇑ connective tissue fibrosis
Type I & II muscle atrophy	20% loss of muscle strength per week

Joint Immobilization Irreversible changes after 8 weeks
Bone demineralization
Capsular adhesions
⇓ ligamentous tolerance (includes annular disc weakness)
Shrinks joint capsule
⇑ compressive loading

Disk Biochemistry	**Cardiopulmonary**	**Nervous System**
⇓ oxygen	⇓ in VQ2 max	⇓ proprioception
⇓ glucose	⇑ maximal heart rate	⇓ central neuromotor control or movement & posture
⇓ sulfate		
⇑ lactate concentration		
⇓proteoglycan content		

Note: Chiropractic is similar to physical therapy in that it takes multiple sessions to re-educate and alter the physiology of the tissue, especially in a chronic condition.

Chiropractic Research Foundation of National Chiropractic Association, Committee on Research of the International Chiropractic Association & Parker Chiropractic Research Foundation. The majority of these cases were previously diagnosed & cared for by practitioners other than Chiropractors, Nov 2006				
Conditions	Much Improved	Slightly Improved	Percent Same	Percent Worsened
Allergies	87.2%	10.3%	2.5%	0.0%
Arm/Leg Pain	88.2%	5.2%	6.0%	0.6%
Arthritis	73.3%	16.8%	9.4%	0.5%
Asthma	80.5%	12.1%	6.5%	0.9%
General Back	81.75%	17.3%	0.95%	0.0%
Bursitis	89.3%	7.1%	3.6%	0.0%
Chest Pain	91.0%	7.1%	1.9%	0.0%
Dizziness	86.3%	7.8%	5.9%	0.0%
Gall Bladder	80.9%	11.3%	5.8%	2.0%
Tension	72.9%	16.5%	8.8%	2.2%
Hay Fever	81.6%	13.4%	5.0%	0.0%
Headaches	83.2%	11.1%	5.1%	0.6%
Herniated Disc	88.2%	7.9%	3.5%	0.4%
High BP	73.0%	19.3%	6.4%	1.3%
Joint Pain	82.2%	9.7%	8.1%	0.0%
Low Back	87.3%	8.0%	4.2%	0.5%
Low BP	73.6%	17.6%	7.8%	1.0%
Migraines	86.6%	8.1%	2.9%	2.4%
Nausea	87.2%	10.3%	2.5%	0.0%
Nervousness	80.8%	12.8%	5.3%	1.1%
Neuralgia	80.1%	14.2%	5.7%	0.0%
Neuritis	86.4%	6.4%	7.2%	0.0%
Numbness Hands/Feet	86.5%	8.0%	5.5%	1.0%
Rheumatism	77.2%	14.7%	8.1%	0.0%
SI Disorders	81.8%	17.2%	1.0%	0.0%
Sciatica	85.0%	9.4%	5.1%	0.5%
Sinusitis	83.2%	11.8%	4.7%	0.3%
Spinal Curves	82.9%	5.7%	8.6%	2.8%
Stiff Necks	93.2%	4.4%	2.4%	0.0%
Stomach	82.5%	13.1%	3.7%	0.7%

The Chiropractic Experience
Corrects the cause, doesn't just treat symptoms
Improves immunity, overall body function & overall health
Relief from pain & symptoms
Quicker recovery & back to work faster
Can prevent surgery
Safe, painless & affordable health care
Natural, no drugs or needles
Restores normal nerve supply
Normalizes blood flow
Slows spinal degeneration & improves disk health
Improves posture & restores mobility
Relieves stress, tension & increases energy
Slows the aging process
Improves athletic performance
Allows better sleep

Your Results May Vary! Share this with your patients.
Due to:
1. Severity of the injury.
2. How long you have had the injury.
3. Your age.
4. Your overall health & ability to recover.
5. Your compliance with care.
6. Ability to avoid activities that perpetuate the injury.

Research $ Harvard University will receive $700 million from the NIH this year for medical research. Chiropractic research has received less than $20 million in 100 years!

Back Pain & Health Costs
- 80% of adults have back pain at some point
- $30.3 billion spent
- $4.5 billion spent on prescriptions
- For those with any expense for back pain, per person cost was $1,589

Agency For Healthcare Research & Quality, 2010

Insurance Says Chiropractic Helps JMPT, 2005
For low back & neck pain, using chiropractic benefits resulted in reduced rates of:
inpatient car, surgery advanced imaging & plain-film x-rays

Medical vs Chiropractic Management JMPT, 2007
Chiropractic care decreases: in-hospital admissions 60%, hospital days 59%,
outpatient surgeries & procedures 62%, pharmaceutical costs 83%

Muscle Relaxants Spine, 2004
- 63% of pts who saw an MD took a muscle relaxant for back pain as compared to only 23% of DC pts
- Pts using muscle relaxants recovery time was 2x as long: 32.4 days

<u>Technique</u> Turn The Power On! Adjust (be able to do it)

"Practice Does Not Make Perfect. Perfect Practice Makes Perfect!"~ Vince Lombardi

Light Touch: Demonstration Touch your forearm, the first time palpate firmly, the second time palpate lightly. Which way can you feel the most detail? Remember the hair in the phone book drill.
Now try that with your spinal palpation skills!

Contact: Demonstration Light contact as if you are touching a child. Your hands should be hovering around the neck instead of a firm contact. No digging as the pt will become tense!

Broad Non-Specific Contact vs. Specific Contact With a broad contact the pt does not tighten up. As you go to adjust simply move your hands so you have a specific contact.


No Specificity? As you give the adjustment your hands shift from a non-specific to a specific contact.


Tissue Pull: Demonstration Just move the loose tissue out of the way. No digging as the pt will become tense! We're NOT trying to get bone-on-bone contact! It is not possible as the bones are deep in the soft tissue.

For a light touch in the neck: move your contact hand away from the bone & midline. On set up, use slight traction & then drape the neck over your contact point rather than pushing in, as this jams the joint.

Reading the joint! Which way do you adjust, the way the bone moves the easiest or the hardest? If the vertebra is subluxated or fixed on the left. We would adjust from the left. What is our line of drive? It has to be with the plane line of the facets, which is the direction that allows the most glide. Push in several times so you can "feel or read" that glide. This is especially important on a flexible pt & on that first adjustment.

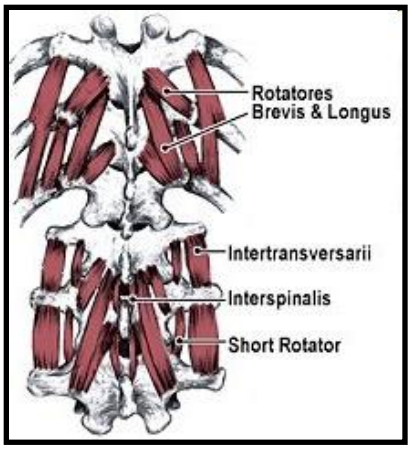
Coupled Motion of the Neck: Demo
Try all 3 possibilities, see which one you like best!
1. first rotate and then laterally flex
2. first laterally flex and then rotate
3. rotate & laterally flex simultaneously
The neck moves easiest when both motions are done at the same time, try it.

Coupled Motion ~ Proper Position

Have the nose centered in line with the sternum, which allows for maximum patency of the vertebrobasilar artery & better facet motion!

Multiple Vectors & Torque

The more vectors and/or torque you can include in your adjustment the easier the joint will release. This is true because of the biomechanics of the bony joint & that the muscle fiber angles vary for a given joint. Multiple directions maximizes GTO firing in the highest number of muscle fibers.



Visualize!

You should see in "your mind's eye"
the mechanics of the spine.
Practice setting up without looking.
Does the pts head end up in the proper position?
Your eyes & brain will only distract you from what you are feeling.

Please No Neck Rotation



Raise The Head Piece!
To keep flexion in the adjustment without having the pt strain their neck muscles, raise the head piece or put a wedge or pillow under the head.

The Car Wash For The Guarding Pt. Your pt wants to move their head & won't relax. Tap their face & ask the pt to bring their ear into your hand - they get to move their head. Use your hands as "guide rails", pushing them into coupled motion. Once the neck reaches the end ROM the pt stops contracting. At that instant you adjust. This is PNF; the pt contracts & then relaxes. This works great!

Mock Thrusts To distract the pt pretend to adjust & give a fake or mock thrust. The pt thinks the adjustment is over & once you feel them relax, then thrust. This move turns off the muscle via GTO firing.

Double Thrusts If you adjust & "miss", don't set-up again, just thrust again immediately. This can work well as the tissue is now inhibited & you will likely catch the pt off-guard.

Occipital Bridge

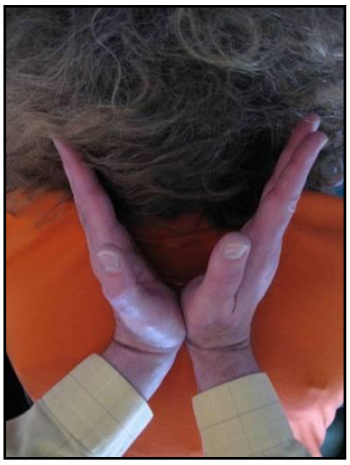
Press finger tips into sub-occipital triangle muscles at the base of the skull & allow the patient's head to fall into your hands as the muscles relax.

Straight Tug A short quick tug can help release a facet joint. Keep the neck in slight extension. The distance that you tug should be short as you can tear meningeal fibers.

The Shimmy-Shake, Breath Mint Adjustment For the pt who tightens up at the last second. Find the segment you want to adjust & take your tissue pull. Once you have the contact point, move & shake your hands around to distract the pt. This also fires the GTO's, inhibiting the involved muscles. The pt will have a much smoother, more comfortable adjustment.

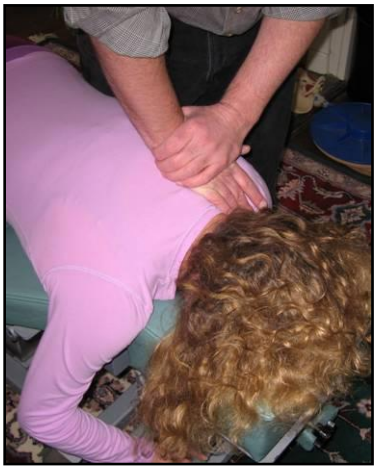
The 6' 4" Adjustment
Try not contacting the pt until they have taken a breath. This decreases pt tightening & low back stress for the Doc!

Thoracic Spine ~ Knife Edge Curl Fingers
Curl fingers throughout thoracic region, especially effective in upper thoracics.

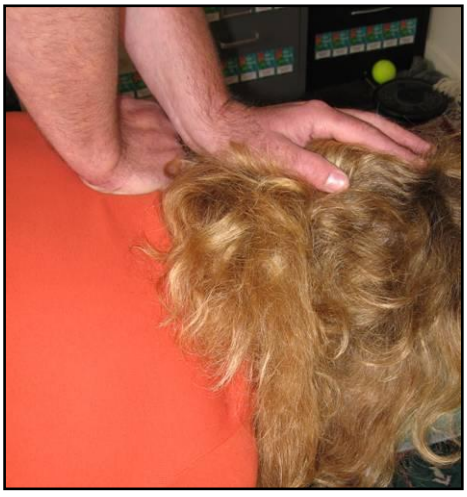


“V” Hands at T1-T3
Helps avoid the occiput during the thrust.

Thoracics ~ Single Hand Works well from T1-T3, for deep sets.



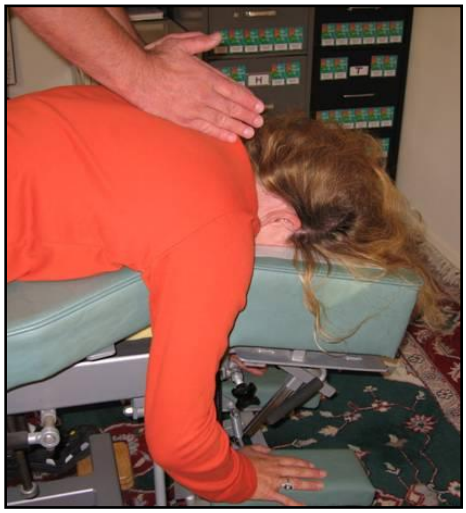
Thoracics ~ Single Hand
Tilt The Head & Traction Neck ~ Works well from T1-T3



Thoracics ~ Thumb Move ~ Works well from T1-T3

Thoracics ~ Tilt Headpiece or Raise Drop

Works well from T1-T3

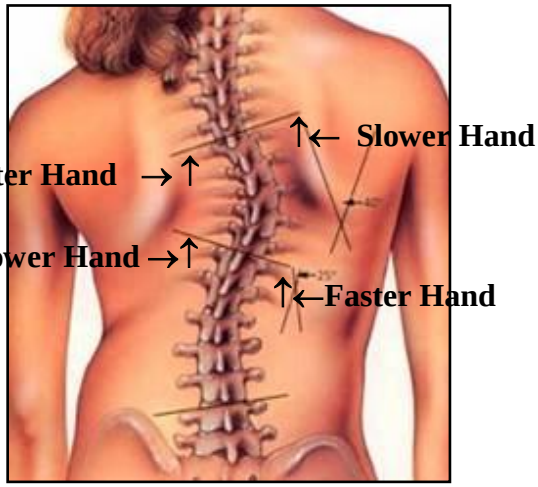


The Pickle Jar Adjustment Which way to adjust? Can we adjust opposite the listing? The vertebra will not stay in that position. Ligaments are causing the misalignment & adjusting the wrong way may ⇑ the motion. Think of loosening a jar lid, if you twist the wrong way first it may help loosen the lid. Gained motion far outweighs any aberrant neurological input.

PNF Adjusting Thoracic Spine Before you adjust have the patient squeeze their scapulae together for 2-5 seconds and then relax. Then have them look up for 2-3 seconds. This will allow the muscles of the upper thoracic region and lower cervical spine region to relax.

Torque Move For Scoliosis: Torque upward on the concave side of the curve.

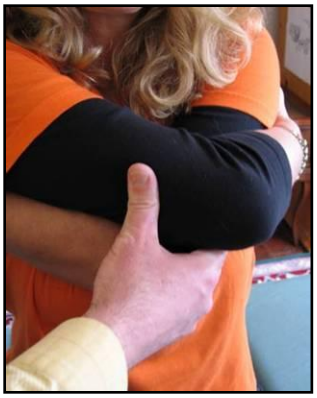
Riverboat Adjustment: (relative motion) Instead of using torque on a rotated vertebra, thrust straight I-S & P-A using a double knife edge contact. On the side the vertebra is rotated "I" have that hand travel fastest & furthest. The other hand on the side rotated "S" will travel slower & not as far. This takes the rotation out & opens the joint I-S & P-A.



Lower Transitionals

Have the pt push their pelvis downward. Pt takes a breath & holds it, then you apply a quick short thrust. Lock the drop piece, the pelvis rotates posteriorly, opening the transitional area. Works well in the T10-L2 region.

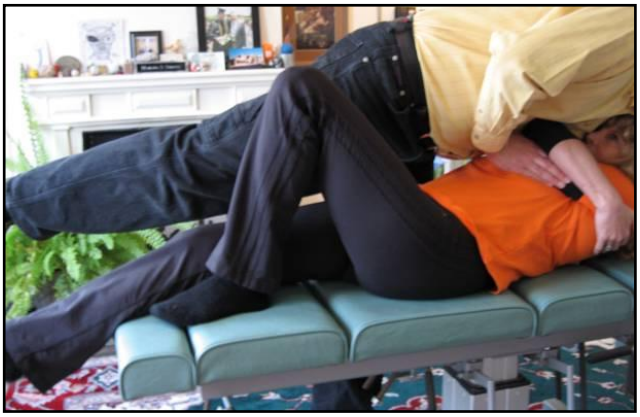
Anterior Dorsals




Anterior Dorsals Push elbows in opposite direction to tighten the spine. Make sure pt tucks chin thru the entire adjustment to tighten the thoracic spine.

Anterior Dorsals Can be done in the thoracic or lumbar spine.


Anterior Dorsals Lower pt keeping them rolled & chin tucked.

Anterior Dorsals
To get more leverage swing your back leg up as you rock the pt back.

Anterior Dorsals Upper Thoracics
Have the pt lift their pelvis off the table. This helps direct the force into that region.

Low Back Warm-up Cross stretches before & after an adjustment.





Lumbar Spine Rotational Stretches Have stabilization hand on the same side of the spine as the stretching hand. Can be used for long & short lever stretching.

Lumbar Spine ~ Side Posture: PNF Stretch

Use PNF protocols to help pt relax back before and/or after an adjustment.

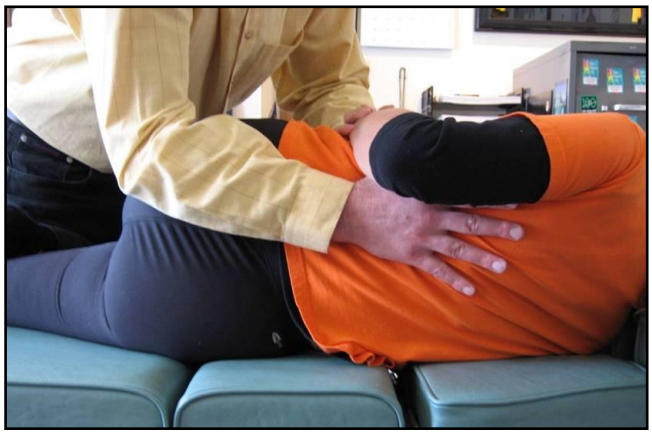
Lumbar Spine
Side Posture: PNF Stretch
This position uses a longer lever.

Lumbar Spine ~ Seated PNF Release
Have pt extend back into your hands providing resistance. Works well to shut off spasms before or after an adjustment. Have pt go through a full ROM if possible.

Lumbar Spine
Side posture: use the drop piece to provide more energy.

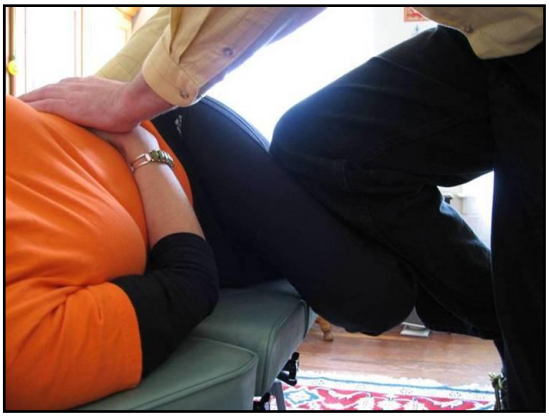
Lumbar Spine
Have pt place their bottom hand up.
This allows the pt to roll.

Lumbar Spine
Lift back leg
& use as a long lever.
DCs thigh should be up against pts thigh.



Lumbar Spine
Side posture: forearm move.
Use your entire forearm to traction the pelvis down & around. Then use your regular drop. Works well on tough to adjust patients & for general mobilization.

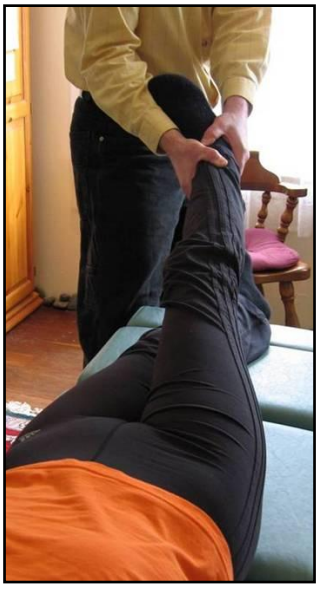
Fire Hydrant ~ Kick Move
Grab the back of the pts thigh with the inside of your thigh to get the proper lumbar spinal flexion & pelvic rotation.



Lumbar Spine
Side posture: modified kick.
Slide your knee down the patient's thigh to increase your leverage.

Lumbar Spine
Crawl up on table & use your chest to adjust. Easier on DC's back & easier to control. Please debrief pt on this one.

Lumbar Spine
Easy way to traction out the low back & can be used to relieve a pt with an anterior spondy.



Hip Tugs: Internal Rotation & Straight
Great for hip joint & piriformis release.

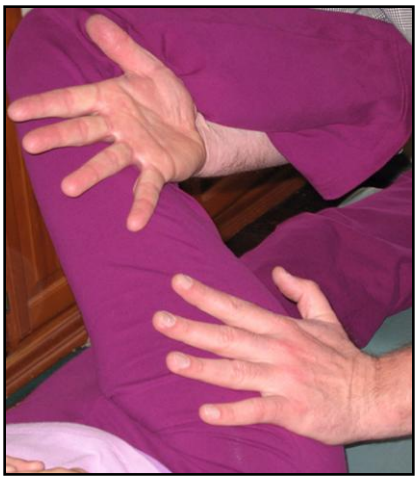
Hip Thigh Tugs: Int/Ext Rotation, Straight
Grasp around upper thigh, can tug in any direction.
Great for hip, SI joint & low back.

External Rotators

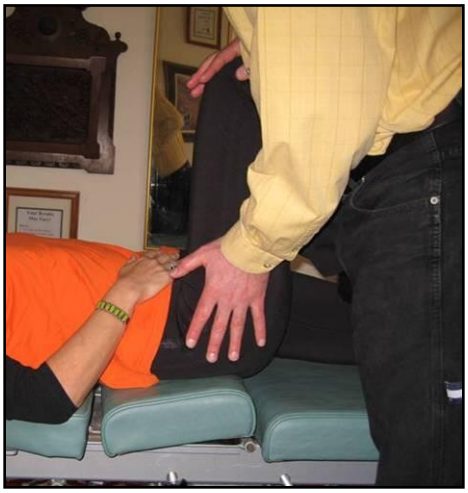
Hip - Slide Moves

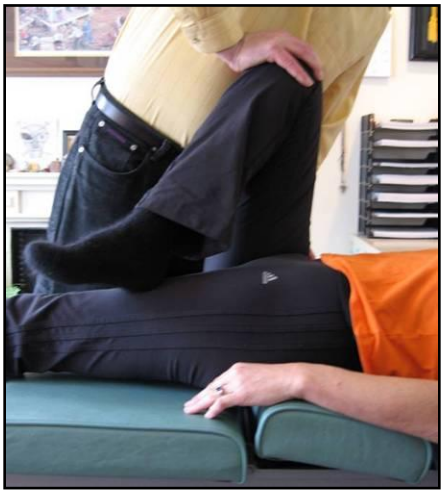
Gentle hip joint release for hip rotators.
Hand on hip joint slides off trochanter 3x.

Internal Rotators



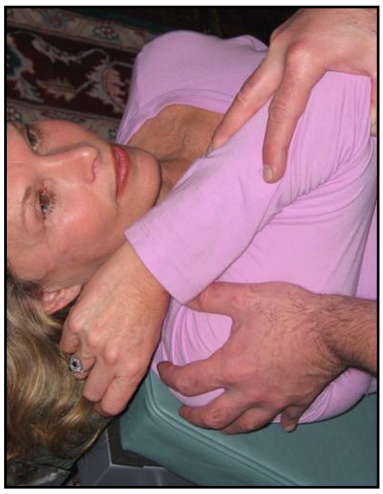
Hip - Drops Int/Ext Rotation or Straight. Use drop piece in all ROM's





Knee - Tugs & Set Rotate femur externally & tibia internally to "reset" knee joint.

Shoulder Tugs: AI-EX Moves.
Great for releasing rotator cuff & frozen shoulder.
Shoulder Drops: AI & EX Moves



Shoulder Drops "Y" Position: Pec Minor Use drop table.
Doctor pushes in direction of fibers or direction arms are hanging.

Please visit backtochiropractic.net and you can find over 45 files to download. Feel free to use them however you see fit.

Thank-You
Marcus Strutz DC
Back To Chiropractic CE Seminars
I hope you learned some new adjusting moves and ideas on how to prepare the patient for the adjustment.

Take the exam and then e-mail your answer sheet to: **marcusstrutzdc@gmail.com**