



Wellness Forum Health

**not just *different* healthcare,
but healthcare that *makes a difference!***

The Informed Medical Consumer Series Part IV Class V Musculoskeletal Issues

presented by Eileen Kopsaftis, BS, PT, CAFS, CMI, CHE

www.havelifelongwellbeing.com

National Institutes of Health: Pain

- Pain affects more Americans than diabetes, heart disease, and cancer combined
- #1 reason to seek medical care
- Costs over \$100 billion each year
- 1 in 3 chronic pain & 2/3 for over 5 years
- 100 million in US living w/ chronic pain

American Pain Society

2nd leading cause of medically related loss of work time ~ over 50 million lost work days/year

National Sleep Foundation

1 in 3 loses more than 20 hours of sleep per month due to chronic pain

Back Pain Statistics

- About 80% of the population is affected by back pain at some time
- \$56 billion is spent annually treating back pain

Back Pain Statistics

2010 Global Burden of Disease Study estimated that LBP is among the top 10 diseases and injuries that account for the highest number of YLD (years lived w/disability) worldwide.

Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*, 2012, 380(9859):2163- 96. doi: 10.1016/S0140-6736(12)61729-2. Erratum in: *Lancet*, 2013, 381(9867):628. Al Mazroa, Mohammad A

- 50% of the U.S. population develop DJD or OA
- OA is leading cause of chronic disability in the U.S.

- **Current Medical Care for Pain & Injuries is Misguided**
- **Current Studies of Efficacy: Is it Working?**
- **What Does Work for Pain?**
- **How to Access Quality Treatment for Pain**

Current Medical Care for Pain & Injuries is Misguided

- Medications are shown to be ineffective with many negative health effects
- Medical imaging is often not representative of the problem
- Surgery is often not effective and can add to the problem

Common Treatment for Pain

- Acetaminophen (analgesic & antipyretic)
- NSAIDS (anti-inflammatory, analgesic, and antipyretic)
- Antidepressants
- Nerve Block Therapies
- Epidural Steroid Injections

Acetaminophen is Useless for LBP

2014 randomized placebo-controlled trial looking at the efficacy of acetaminophen (Tylenol & Excedrin)

- No pain relief
- No improved healing speed
- No positive impact with any factor of LBP: disability, function, global symptoms change, sleep quality or quality of life.

"The results suggest we need to reconsider the universal recommendation to provide paracetamol as a first-line treatment for low-back pain."

Williams C, Maher C, McLachlan A et al. "Efficacy of paracetamol for acute low-back pain: a double-blind, randomized controlled trial." Lancet Nov 2014;384(9954):L1586-1596

Koes B, Enthoven W, "Do patients with acute low-back pain need paracetamol?" Lancet Nov 1 2014;384(9954):1556-1557

Acetaminophen is Useless for LBP

1652 patients with acute LBP randomly assigned to one of three groups:

- one group took paracetamol 3 times per day
- second group took paracetamol only as needed (prn)
- third group took placebo

The median time for recovery was 17 days in the regular and prn groups, and 16 days in the placebo group.

The patients who took drugs were *no better off* than the patients who took placebo.

Researchers concluded that "advice and reassurance rather than analgesics, should be the focus of first-line care."

Williams C, Maher C, McLachlan A et al. "Efficacy of paracetamol for acute low-back pain: a double-blind, randomised controlled trial." *Lancet* Nov 2014;384(9954):L1586-1596

Koes B, Enthoven W, "Do patients with acute low-back pain need paracetamol?" *Lancet* Nov 1 2014;384(9954):1556-1557

Acetaminophen Toxicity

- nausea, upper stomach pain, itching, loss of appetite
- dark urine, clay-colored stools
- jaundice (yellowing of the skin or eyes)
- associated with cases of acute liver failure, at times resulting in liver transplant and death.

Acetaminophen Toxicity

- most of the cases of liver injury are associated with doses that exceed 4,000 milligrams per day, and often involve more than one acetaminophen-containing product.
- most common drug ingredient in America
- in more than 600 medicines, including over-the-counter (OTC) and prescription (Rx) medicines

Ultracet is Only 15% Effective for Pain

336 patients [pain visual analog scale (VAS) scores \geq 40/100] received tramadol/APAP (n = 167) or placebo (n = 169).

- Mean baseline pain VAS score was 67.8.
- Analysis reported significantly better (?) mean final pain VAS scores (47.4 ultracet vs 62.9 placebo)
- **15.5% less pain than placebo**
- Side effects: nausea, dizziness, constipation

Peloso PM1, Fortin L, Beaulieu A, Kamin M, Rosenthal N; Protocol TRP-CAN-1 Study Group. "Analgesic efficacy and safety of tramadol/acetaminophen combination tablets (Ultracet) in treatment of chronic low back pain: a multicenter, outpatient, randomized, double blind, placebo controlled trial". J Rheumatol. 2004 Dec;31(12):2454-63.

Conventional Treatment of LBP: NIH

NSAIDS: Long-term use associated with

- stomach irritation, ulcers, heartburn, diarrhea, fluid retention, kidney dysfunction and cardiovascular disease
- alter the way the body processes or eliminates other medications.

2015 Cochrane Review

Although often considered to be lacking adequate evidence, nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used in the management of neuropathic pain.

Goal: To assess the analgesic efficacy of oral NSAIDs for chronic neuropathic pain in adults

2015 Cochrane Review

Findings: There was no indication of any significant pain reduction with NSAIDs.

Authors conclusion: There is no evidence to support or refute the use of oral NSAIDs to treat neuropathic pain conditions.

Moore RA, Chi CC, Wiffen PJ, Derry S, Rice AS Oral nonsteroidal anti-inflammatory drugs for neuropathic pain. Cochrane Database Syst Rev. 2015 Oct 5;10:CD010902. [Epub ahead of print]

NSAIDs: Risks

16,500 deaths annually as a result of NSAID-induced GI bleeding.

Singh G, Triadafilopoulos G. Epidemiology of NSAID induced gastrointestinal complications. J Rheumatol. 1999;26(Suppl 56):18-24.

NSAIDs: Risks

3,200 deaths annually as a result of NSAID-induced GI bleeding based on US mortality data reported in the 1990s.

Tarone RE, Blot WJ, McLaughlin JK. Nonselective nonaspirin nonsteroidal anti-inflammatory drugs and gastrointestinal bleeding: relative and absolute risk estimates from recent epidemiologic studies. *Am J Ther.* 2004;11(1):17-25

NSAIDs: Risks

A new study shows that NSAID use increases the risk of Atrial fibrillation, the most common arrhythmia.

A meta-analysis showed that NSAID use was associated with a 12% increased risk of Atrial fibrillation; new users had a 53% increased risk of developing A-fib.

Liu G, Yan Y, Zheng X, Xu Y, Lu J, Hui R. " Meta-Analysis of Nonsteroidal Anti-Inflammatory Drug Use and Risk of Atrial Fibrillation." Am J Cardiol November 15 2014;114(1):1523-1529

NSAIDs: Risks

Data have linked COX-2 inhibitors with serious cardiovascular and/or cardiorenal effects and/or serious cutaneous adverse reactions (SCARs).

COX-2 inhibitors and non-selective NSAIDs should now be used with increased caution in patients at increased cardiovascular and/or cardiorenal risk, e.g., patients with congestive heart failure, **hypertension**, etc.

Schnitzer TJ. Update on guidelines for the treatment of chronic musculoskeletal pain. Clin Rheumatol. 2006;25 Suppl 1:S22-9. Epub 2006 Jun 2.

Opioids

A study comparing the relative safety of analgesic medications in older patients with arthritis identified all-cause mortality for Medicare beneficiaries with a diagnosis of rheumatoid arthritis or osteoarthritis who were receiving a non-selective NSAID, a selective cyclooxygenase-2 (COX-2) inhibitor, or an opioid.

Opioids

All-cause mortality was higher in patients receiving opioids than other analgesics. An overall mortality incidence rate of 48/1,000 person-years was reported for patients taking non-selective NSAIDs compared with 75/1,000 person-years with opioids.

Solomon DH, Rassen JA, Glynn RJ, Lee J, Levin R, Schneeweiss S. The comparative safety of analgesics in older adults with arthritis. *Arch Intern Med.* 2010;170(22):1968-1976.

Opioids

- Oxycodone
- Hydrocodone
- Hydromorphone

Similar to opiates morphine and codeine

Antidepressants

Antidepressants are perhaps the least well-known in terms of analgesic mechanism of action, despite their extensive use in pain treatment.

Antidepressants have become... common drugs for the treatment of chronic, mainly neuropathic pain, even though their efficacy is limited.

Juan A. Mico´, Denis Ardid, Esther Berrocoso, Alain Eschalier.
“Antidepressants and pain.” TRENDS in Pharmacological Sciences Vol.27
No.7 July 2006

Antidepressants: Side Effects

- Nausea
- Increased appetite and weight gain
- Sexual dysfunction
- Fatigue/drowsiness
- Dry mouth
- Blurred vision
- Constipation
- Diarrhea
- Dizziness
- Agitation
- Irritability
- Anxiety

Antidepressants: Side Effects

“Weight gain and loss of sexual interest and performance are the main things I hear about. The new drugs typically claim to have fewer side effects, but I don’t know that the data supports that. Sometimes there are pretty striking weight gains.”

Myrna Weissman, PhD, a clinician and epidemiologist at Columbia University

Meds and Fibromyalgia

- A meta analysis of available therapies concluded there was no advantage from taking drugs for fibromyalgia.
- National Data Bank on Rheumatic Disease, contains data on 3123 adults with fibromyalgia who were followed for 11 years.
- Drugs resulted in no improvement in fatigue and functional status, and improvement in pain was very small (0.2 on a 10-point scale).

Meds and Fibromyalgia

- When asked to list the top 10 most beneficial treatments for fibromyalgia; none of them were drugs.
- When asked to list the 10 most harmful therapies, patients listed only FDA-approved drugs.

European League Against Rheumatism (EULAR) Congress 2013: Abstract SP0061. Presented June 13, 2014.

Nuesch E, Hauser W, Bernardy K, Barth J, Juni P. "Comparative efficacy of pharmacological and non-pharmacological interventions in fibromyalgia syndrome: network meta-analysis." *Ann Rheum Dis* 2013;72:955-962

Lauche R, Hauser W, Jung E et al. "Patient-related predictors of treatment satisfaction of patients with fibromyalgia syndrome: results of a cross-sectional survey." *J Clin Exp Rheumatol* 2013 Vol.31, N°6 ,Suppl.79 - PI 0034, PF 0040

Nerve block therapies

Injections of local anesthetics, botulinum toxin, or steroids into affected soft tissues or joints to more complex nerve root blocks and spinal cord stimulation.

When extreme pain is involved, low doses of drugs may be administered by catheter directly into the spinal cord.

The success of a nerve block approach depends on the ability of a practitioner to locate and inject precisely the correct nerve.

Chronic use of steroid injections may lead to increased functional impairment.

http://www.ninds.nih.gov/disorders/backpain/detail_backpain.htm#290533102

Epidural Steroid Injections

Commonly used for treating LBP and sciatica associated with inflammation.

Pain relief tends to be temporary and the injections are not advised for long-term use.

Epidural Steroid Injections

An NIH-funded randomized controlled trial assessing its benefit for chronic LBP associated with spinal stenosis showed that long-term outcomes were **worse** among those people who received the injections compared with those who did not.

http://www.ninds.nih.gov/disorders/backpain/detail_backpain.htm#290533102

Imaging & Tests

- X-rays
- MRI's
- CT Scans

Medical imaging is often not representative of the problem

Diagnostic Tests Can Be Misleading

- MRI's often identify small tears in the meniscus and assume this is the cause of knee pain
- Researchers scanned 991 people; some with knee pain and some without
- Meniscal tears were as common in those with **no** pain as they were in those with pain

Englund M, et al. Incidental Meniscal Findings on Knee MRI in Middle-Aged Elderly Persons." *NEJM* September 11, 2008 vol 35 (11):1108-1115

Diagnostic Tests Can Be Misleading

- 20-25% of people who have **no** back pain have a herniated disc.
- 60% of adults with **no** back pain have degenerative changes in their spine.

Jensen, M et al. "Magnetic Resonance Imaging of the Lumbar Spine in People Without Back Pain." NEJM July 14 1994 vol 331(2):69-73

Diagnostic Tests Can Be Misleading

Dr. M. Modic at the Cleveland Clinic ordered MRI for patients complaining of back pain or leg pain:

- 13% of patients showed worsening of herniated discs in 6 weeks
- Herniated discs disappeared in 15% of patients
- There was no relationship between pain and images: some patients experienced pain after their herniated discs disappeared, while others said they felt better even though the discs had gotten larger

Gina Kolata "The Pain May Be Real, but the Scan is Deceiving." New York Times Dec 8, 2008

Diagnostic Tests Can Be Misleading

- lack of correlation between imaging results and low back pain is well known
- Chronic low back pain often blamed on degenerative changes
- X-rays, CT scans, and MRI's consistently show the presence of bulged/herniated discs, spondylolisthesis, scoliosis, osteoarthritis, pinched nerves, etc. appears unrelated to whether or not someone experiences chronic pain.

Ong A, Anderson J, Roche J. A pilot study of the prevalence of lumbar disc degeneration in elite athletes with lower back pain at the Sydney 2000 Olympic Games. *Br J Sports Med.* 2003 Jun;37(3):263-6.

Borenstein DG, O'Mara JW Jr, Boden SD, Lauerman WC, Jacobson A, Platenberg C, Schellinger D, Wiesel SW. The value of magnetic resonance imaging of the lumbar spine to predict low-back pain in asymptomatic subjects : a seven-year follow-up study. *J Bone Joint Surg Am.* 2001 Sep;83-A(9):1306-11.

Beattie PF, Meyers SP. Magnetic resonance imaging in low back pain: general principles and clinical issues. *Phys Ther.* 1998 Jul;78(7):738-53.

Weishaupt D, Zanetti M, Hodler J, Boos N. MR imaging of the lumbar spine: prevalence of intervertebral disk extrusion and sequestration, nerve root compression, end plate abnormalities, and osteoarthritis of the facet joints in asymptomatic volunteers. *Radiology.* 1998 Dec;209(3):661-6.

Diagnostic Tests Can Be Misleading

Conclusion from a systematic review and meta-analysis:

In the long run, patients who receive an MRI fare no better with their back pain.

Chou R, Fu R, Carrino JA, Deyo RA. Imaging strategies for low-back pain: systematic review and meta-analysis. *Lancet*. 2009 Feb 7;373(9662):463-72.

Surgeries

Surgery is often not effective
and can add to the problem.

Knee Surgery: NEJM

- 2013 study looked at people with meniscal tears and compared those who had surgery vs those who did not.
- Participants had one or more symptoms of meniscal tears for at least a month that persisted after treatment with pain pills, exercise or limiting movement and a diagnosis of mild-to-moderate osteoarthritis was confirmed with imaging.
- Patients were randomized to receive either arthroscopic partial meniscectomy followed by physical therapy or a 6-week physical therapy program.

Katz J, Brophy B, Chaisson C et al. "Surgery vs physical therapy for a meniscal tear and osteoarthritis." NEJM March 19 2013 doi:10.1056/NEJMoa1301408.

Knee Surgery: NEJM

The results were about the same for both groups. The researchers concluded that the differences between the two groups were neither "clinically important nor statistically significant."

*Katz J, Brophy B, Chaisson C et al. "Surgery vs physical therapy for a meniscal tear and osteoarthritis." NEJM March 19 2013
doi:10.1056/NEJMoa1301408.*

Knee Surgery: NEJM

- every year there are hundreds of thousands of knee surgeries performed in the U.S.
- most of these surgeries are useless; no better than sham surgery according to a study published in the *New England Journal of Medicine*.

Knee Surgery: NEJM

The study estimated that 700,000 unnecessary arthroscopic knee surgeries are performed every year in the U.S. at a cost of close to \$4 billion.

Svonon R, Paavola M, Malmivaara A et al. "Arthroscopic Partial Meniscectomy versus Sham Surgery for a Degenerative Meniscal Tear." *NEJM* 2013;369:2515-2524

Surgery vs. No Surgery: JAMA

Patients with pain from herniated discs from 13 spine clinics in 11 states were followed

Patients who did not have surgery had physical therapy, CBT counseling, and some took anti-inflammatory drugs

40% of those assigned to have surgery did **not** because they improved while waiting

Surgery vs. No Surgery: JAMA

- After 3-6 months, patients in both groups reported significant improvement
- After two years, patients in both groups reported “major improvement” in pain levels
- Patients who opted not to have surgery were no worse off as a result of not having surgery

Weinstein J, Tosteson T, Lurie, J et al. “Surgery vs. Non-operative Treatment for Lumbar Disk Herniation. The Spine Patient Outcomes Trial (Sport): A Randomized Trial *JAMA* 2006;296:2441-2450

Spinal Fusion: BMJ

- There is no difference in outcomes for patients who have spinal fusion surgery vs. patients who undergo intense rehabilitation
- There are complications from spinal fusion; none from rehab

Fairbank J, Frost H, Wilson-MacDonald J, et al. Randomized controlled trial to compare surgical stabilization of the lumbar spine with an intensive rehabilitation program for patients with chronic low back pain: the MRC spine stabilization trial. *BMJ*. 2005;330:1233-1239.

Rivero-Arias O, Campbell H, Gray A, et al. Surgical stabilization of the spine compared with a program of intensive rehabilitation for the management of patients with chronic low back pain: cost utility analysis based on a randomized controlled trial. *BMJ*. 2005;330:1239-1245.

What Does Work for Pain?

- Diet to reduce inflammation
- Exercise
- Weight
- Treating the *cause* of the pain vs the symptom
- Restoring functional strength and movement

Stanford University School of Medicine

The primary cause of joint damage is not compression, or wear and tear.

It is *chronic inflammation*.

Common Inflammatory Conditions

- Rheumatoid arthritis
- Shoulder tendonitis or bursitis
- Gouty arthritis
- Lupus
- Osteoarthritis
- Fibromyalgia
- Muscular low back pain
- Muscular neck pain

Symptoms of Inflammation

- Redness
- Swollen joints
- Joint pain
- Joint stiffness
- Loss of joint function
- Generalized pain
- Muscular pain

#1 Cause of Chronic Inflammation?

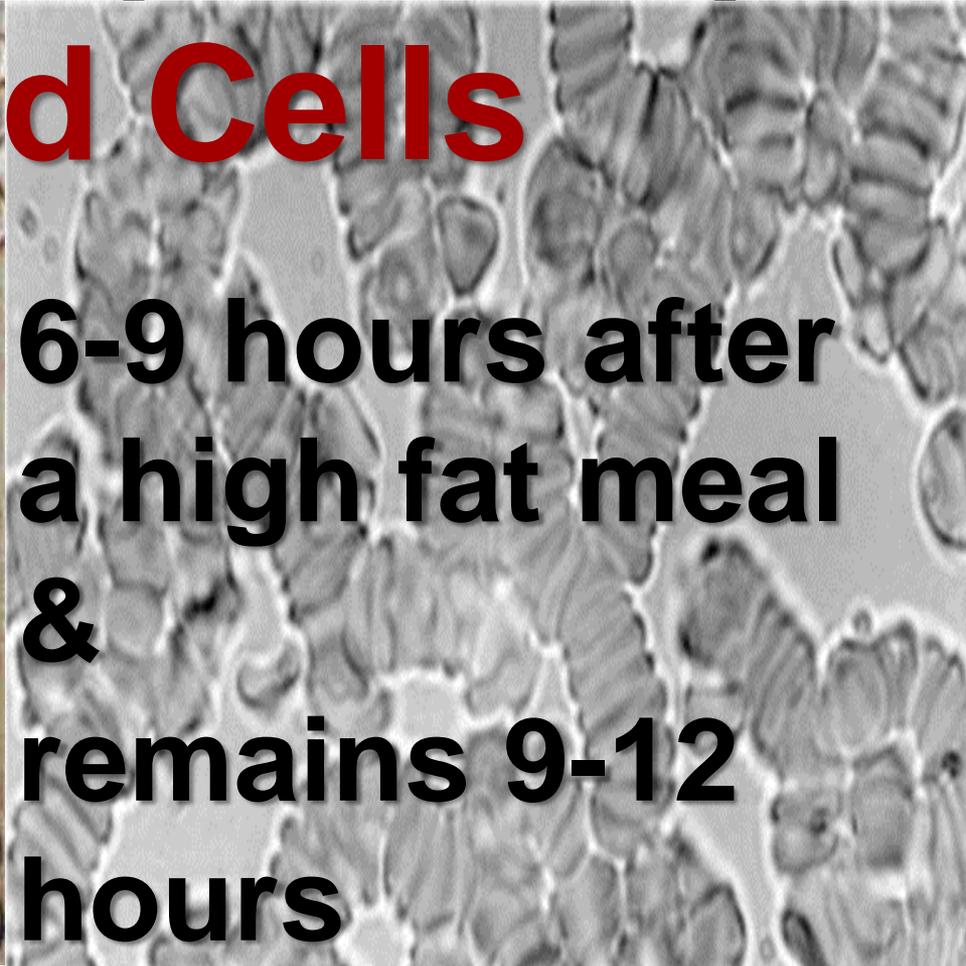
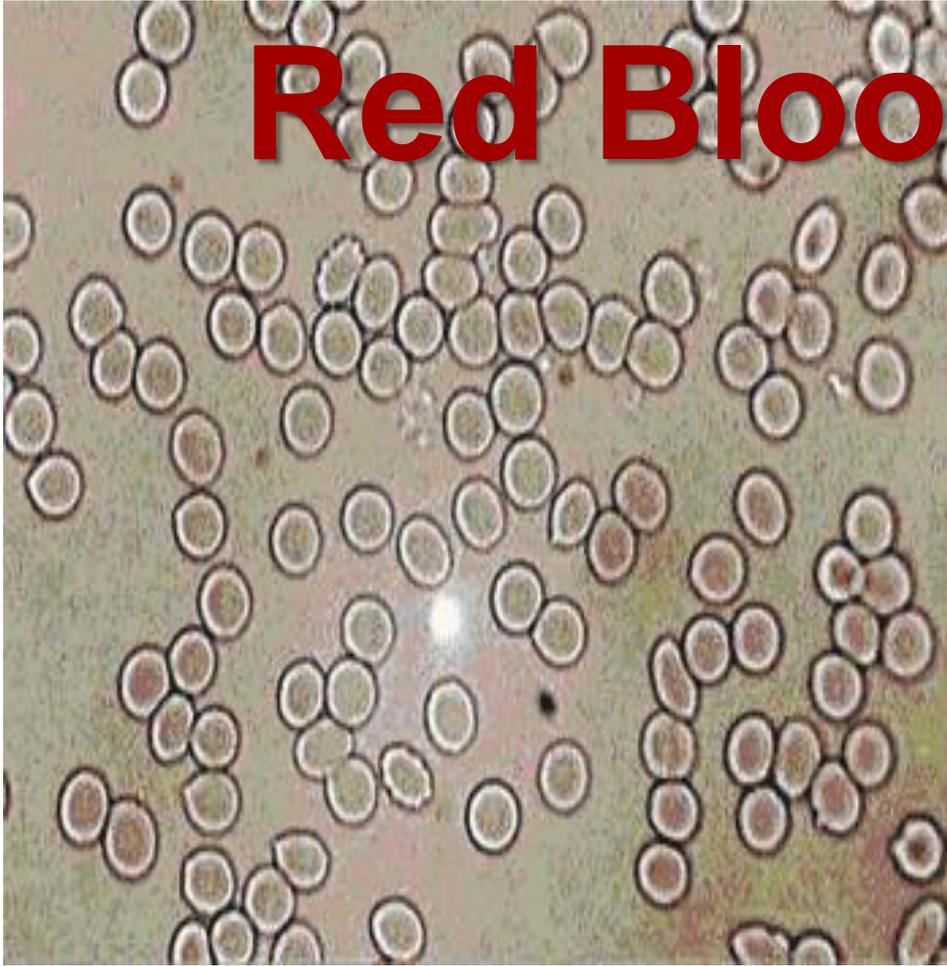


STANDARD
AMERICAN
DIET!

How does diet promote chronic inflammation and pain?

Fat consumption impairs circulation in your body.

Red Blood Cells



**6-9 hours after
a high fat meal
&
remains 9-12
hours**

Oils and Circulation

University of Maryland: bread dipped in olive oil reduced dilation in the brachial artery, indicating injury to the endothelial cells that line the blood vessels and impairment of nitric oxide production.

Vogel, R. et al, "The Postprandial Effect of Components of the Mediterranean Diet on Endothelial Function." *J Am Coll Card* 2000

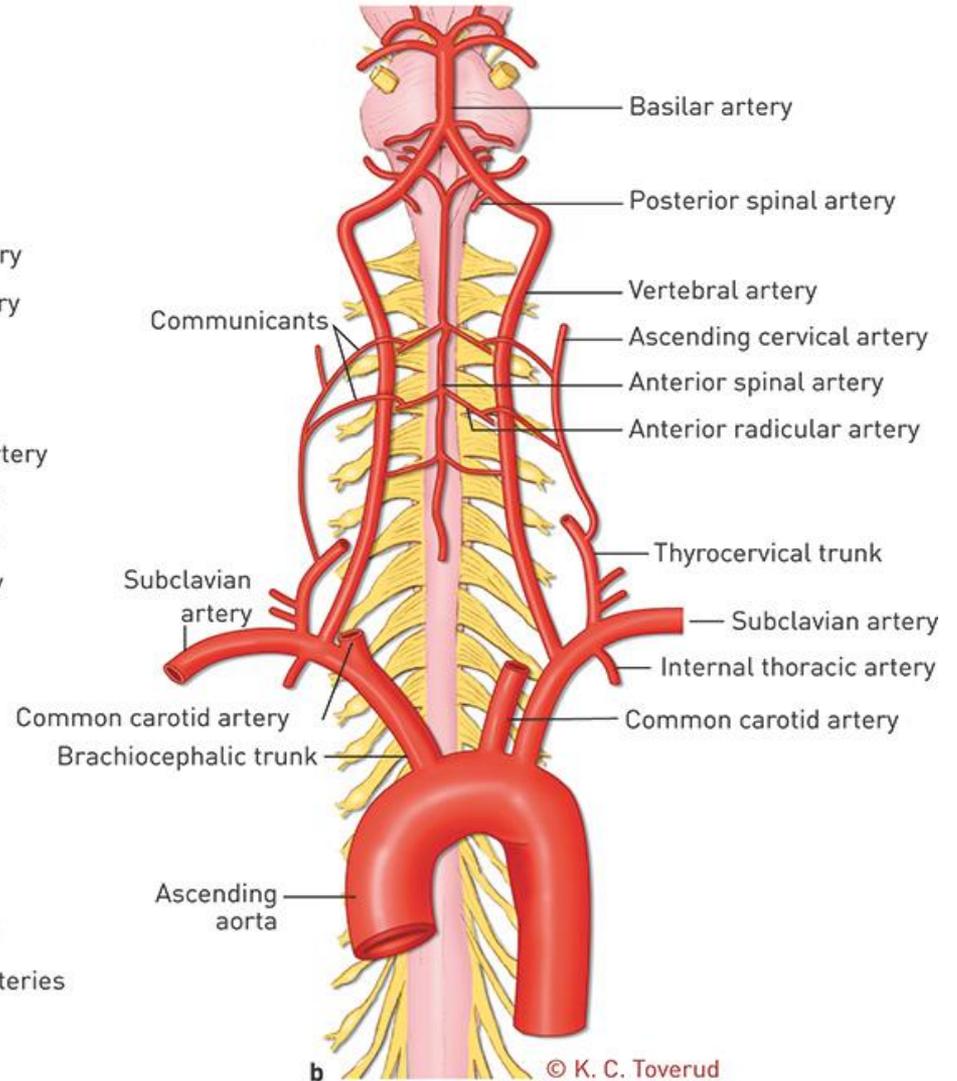
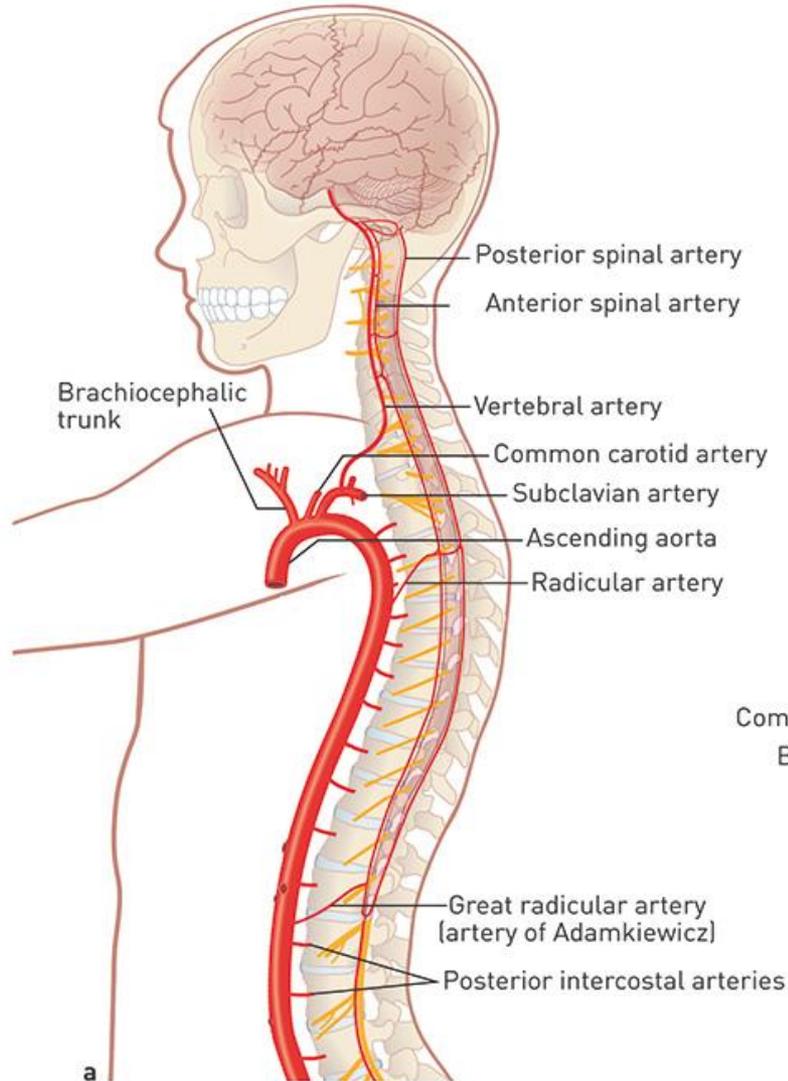
Oils and Circulation

Both omega-3 and omega-6 contribute to the development of plaques, damaging the arteries.

Felton C. et al. "Dietary polyunsaturated fatty acids and composition of human aortic plaques" *Lancet*, 1994, 344:1195

B Hennig and BA Watkins "Linoleic acid and linolenic acid: effect on permeability properties of cultured endothelial cell monolayers." *Am J Clin Nutr* 1989 49: 301-305

Spinal Blood Supply and Pain



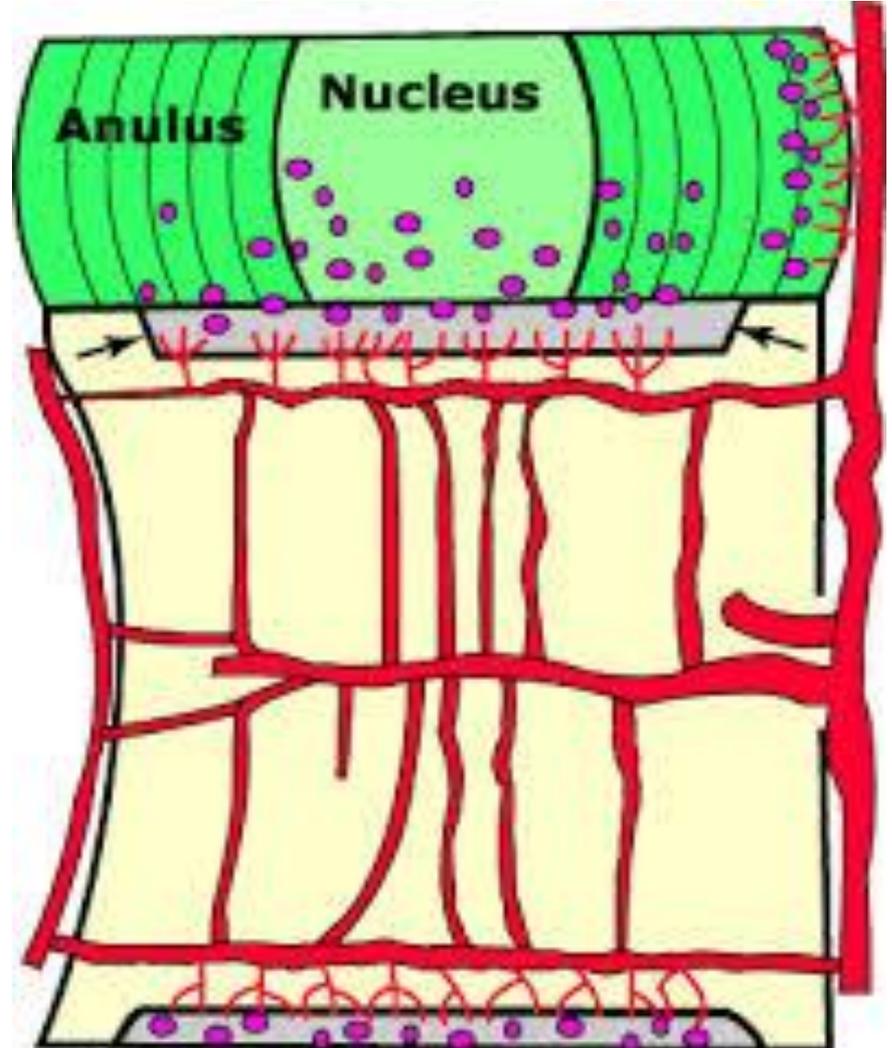
© K. C. Toverud

Lumbar Artery Disease & Pain

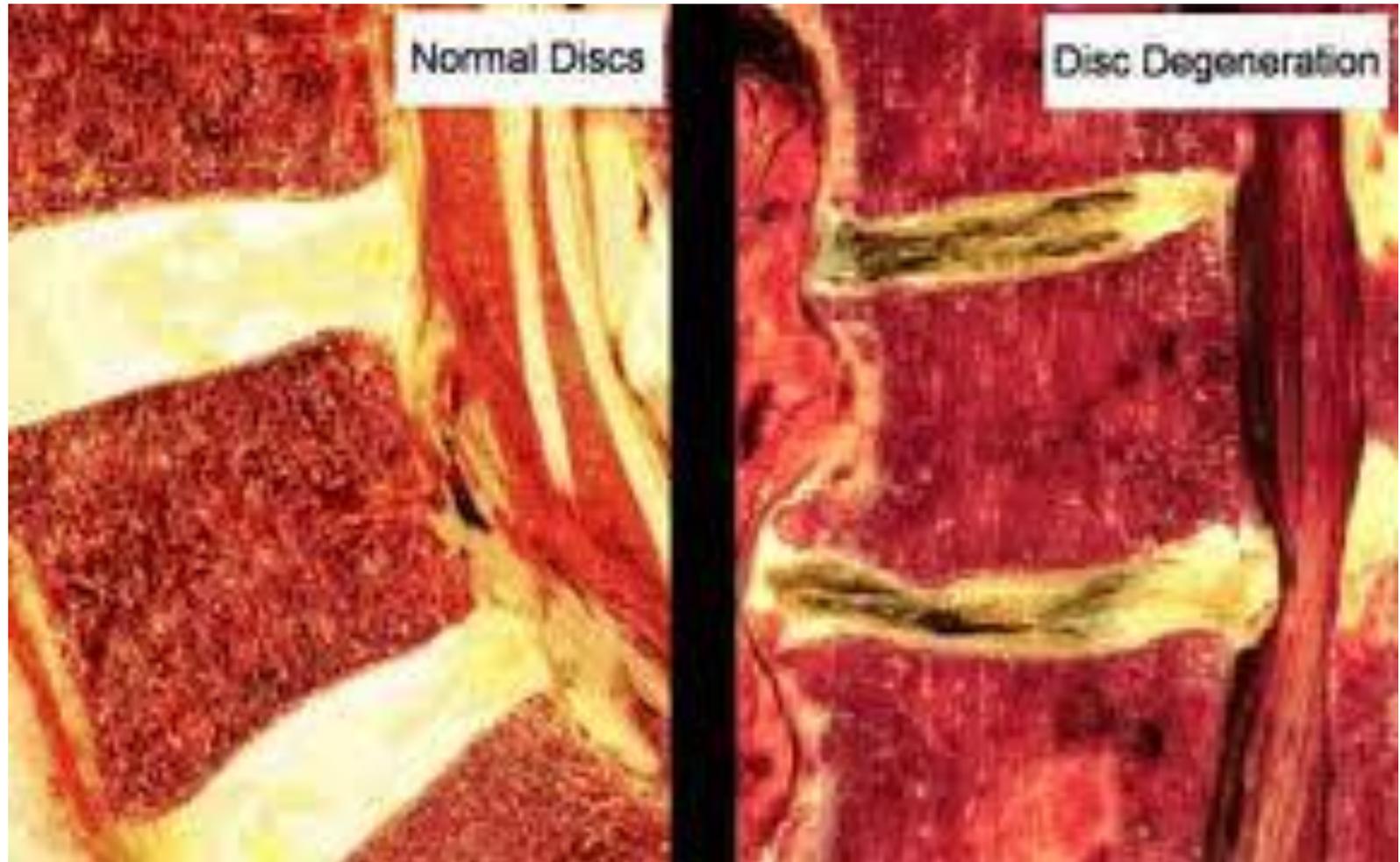
- Atherosclerotic by age 10
- 10% advanced blockages by age 20
- Occurs at the opening of the lumbar arteries
- Greater blockage = greater disc degeneration

Kaupila LI. Can low-back pain be due to lumbar artery disease? Lancet 1995;346:888-89

Spinal Blood Supply and Pain



Spinal Blood Supply and Pain



Dietary Causes: Chronic Inflammation

Animal foods contain high amounts of arachidonic acid which contributes to inflammation



Arachidonic Acid

- stimulates production of pro-inflammatory prostaglandins and leukotrienes
- Too much leads the body to over-respond with inflammation during the healing and repair process.
- when the body is overloaded, the inflammatory process is more difficult to shunt, or reverse.

Arachidonic Acid

USDA's Standard 13 and 16 databases:

- animal meats/oily fish (salmon) produce highest amounts of AA in the body.
- Fruits, vegetables, grains, and legumes (beans/lentils) produce little or no AA.
- Processed baked goods produce a moderate amount.

Dietary Causes: Chronic Inflammation

Fat cells produce inflammatory cytokines.

Excess weight promotes inflammation.

Inflammatory Cytokines

- Proteins that serve as messengers between cells
- Bind to target immune cells triggering immune response
- Excess can lead to inflammation and tissue destruction (rheumatoid arthritis)

**Diet, exercise, and weight loss
can reduce or eliminate pain.**

Dietary Excellence™ and Optimal Habits

A Wellness Forum Health style diet (low-fat, whole food, plant-based, no dairy, no added oils, and water as the primary beverage) is seen to reduce chronic inflammation and pain.

Diet and Inflammation

- Blood markers for inflammation were measured in 1005 middle aged Chinese women who were an average of 58 years old.
- They were divided into 5 groups according to their daily intake of cruciferous vegetables.
- The average intake was about 1 cup per day, and those in the lowest quintile ate about half that amount.
- Women in the top quintile ate about 1½ cups per day.

Jiang Y, Wu S, She X, et al. "Cruciferous Vegetable Intake Is Inversely Correlated with Circulating Levels of Proinflammatory Markers in Women." *Journal of the Academy of Nutrition and Dietetics* Volume 114, Issue 5 , Pages 700-708.e2, May 2014

Diet and Inflammation

Researchers then compared markers for inflammation like tumor necrosis factor (TNF) and interleukin-6 with dietary intake of cruciferous vegetables and found that these markers were 13% and 25% lower respectively in those women who ate the most as compared to those women who ate the least.

Diet and Inflammation

A study of 44 overweight or obese girls between the ages of 8 and 15 were randomized to two groups, one that added whole grains into the diet and a control group.

- whole grain group asked that half of their grain intake was from whole grains daily for 6 weeks. They were then asked to avoid whole grains for a 4-week washout period, and then crossed over to the other group for an additional 6 weeks.

Diet and Inflammation

Girls in the grain group consumed an average of 98 grams of whole grain per day while those in the control group took in 11 grams per day. Eating whole grains did not affect weight or BMI, but the whole grain girls did experience positive changes in inflammatory markers.

Diet and Inflammation

- The whole grain group had decreases of:
- 22% in levels of C-reactive protein
 - 28% in soluble intercellular adhesion molecule-1 during the 6-week intervention period.
 - the control group had **increases** of 12% and 6% respectively during the same period.

Hajihashemi P, Azadbakht L, Hashemipor M, Kelishadi R, Esmailzadeh A. "Whole grain intake favorably affects markers of systemic inflammation in obese children: A randomized controlled crossover clinical trial." *Molecular Nutrition and Food Research* published online ahead of print doi:10.1002/mnfr.201300582

Diet and Neuropathy

Dr. Neal Barnard with the Physicians Committee for Responsible Medicine and a team of researchers hypothesized that the same diet that is effective for stopping and even reversing type 2 diabetes and reducing insulin needs and comorbidity incidence in type 1 diabetes might be helpful for reducing symptoms of neuropathy.

This was the first study ever conducted on the relationship between diet and diabetic nerve pain.

Diet and Neuropathy

They randomized patients with both type 2 diabetes and diabetic neuropathy to two groups.

- One group was shown how to eat a low-fat, plant-based diet. The diet eliminated animal foods, restricted fat intake to 20-30 grams per day, and focused on fruit, vegetables, grains, and legumes.
- These patients took weekly classes and in addition to the diet, took a B12 supplement.
- The control group just took a B12 supplement, and was not given any dietary instruction.

Diet and Neuropathy

Intervention patients experienced significant improvement in pain.

Electrochemical skin conductance in the foot worsened in the control group but stayed constant in the intervention group, indicating that the diet may have slowed nerve function decline.

Diet and Neuropathy

Intervention patients experienced significant improvement in pain.

- 81% of patients in the intervention group reported **complete remission** of burning pain and improved sense of touch
- the other 19% reported some improvement in symptoms.

Crane M, Sample C. "Regression of diabetic neuropathy with total vegetarian (vegan) diet." J Nutr Med. 1994;4:431-439

Diet, Exercise, and Knee Pain

A recent study showed that patients who lost at least 10% of their body weight had improved levels of pain and better function. Those who engaged in both exercise and better diet had better outcomes than those who only improved in one area. They lost more weight, had less inflammation, more mobility, faster walking speed, and improved health-related quality of life.

Messier S, Mihalko S, Legault C et al. "Effects of Intensive Diet and Exercise on Knee Joint Loads, Inflammation, and Clinical Outcomes Among Overweight and Obese Adults With Knee Osteoarthritis The IDEA Randomized Clinical Trial." JAMA. 2013;310(12):1263-1273. doi:10.1001/jama.2013.277669.

Diet, Exercise, and Knee Pain

The more weight the patients lost, the better they got; weight loss had a dose-dependent effect. Those who lost 10% of body weight showed more improvement than those who lost between 5 and 10%; and those patients did better than those who lost only 5% of body weight.

Diet, Exercise, and Knee Pain

The dietary intervention plan was less than optimal - the patients replaced two meals per day with smoothies and had a real meal once per day with 500-700 calories. After the first 6 months, the smoothies were gradually replaced with lower calorie meals for the next 12 months. The result was a reduction of 800-1000 calories per day. Exercise consisted of aerobic walking and strength training for one hour per day three days per week.

Strength Training and Neck Pain

- 48 women with jobs that involved monotonous activity
- Randomized to participate in strength training, general fitness training or no physical activity
- During a 10-week period training load was doubled for the group participating in strength training – participants experienced a 50% drop in pain scores and muscle strength improved
- Those participating in general exercise showed a small but statistically significant drop in pain scores

Arthritis Care and Research January 2008

Exercise and Arthritis

A study reported in Arthritis Care and Research concluded that osteoarthritis patients who participated in strength training maintained more strength and less narrowing of the joint space than those performing only range of motion exercises.

Exercise and Arthritis

212 older adults with OA of the knee and LE muscle weakness were randomized to participate in strength training or range of motion exercises. The average age was 69 years.

Arthritis Care and Research October 15, 2006

Exercise and Arthritis

- patients exercised 3 x/week for 12 weeks
- strength training group consisted of warm-ups, resistance training using leg presses, curls, seated chest presses and back rows
- range of motion group used flexibility exercises targeting the same areas
- They then transitioned to home based exercise after 12 months.

Exercise and Arthritis

During the 30 month period, subjects in both groups lost strength in lower extremities, but the rate of loss was slower in the strength training than the range of motion group. Hamstring strength increased significantly more in the strength training group.

Exercise and Knee Pain

12-week exercise program for knee pain showed that a combination of exercise classes, education, a home exercise program, and information about exercise options and self-help groups improved function, pain, anxiety, depression, and changed beliefs about exercise and pain.

Hurley M, Walsh N, Bhavani B, et al. "Health beliefs before and after participation in an exercise-based rehabilitation programme for chronic knee pain: doing is believing." *BMC Musculoskeletal Disord.* 2010;11:31

Exercise and Knee Pain

The patients who benefitted most were those whose beliefs about pain and exercise changed as a result of their participation - they walked more, returned to more regular activities and reduced their medications.

Those patients who hung onto their beliefs that surgery was the best option for knee pain did not show similar improvement.

Exercise and Knee Pain

Belief systems matter. People who want to get better and believe that they will, fare better than those who do not believe that improvement is possible.

Proper education matters. Exercise performed improperly can negate improvement and cause and exacerbate injuries.

What Does Work for Pain?

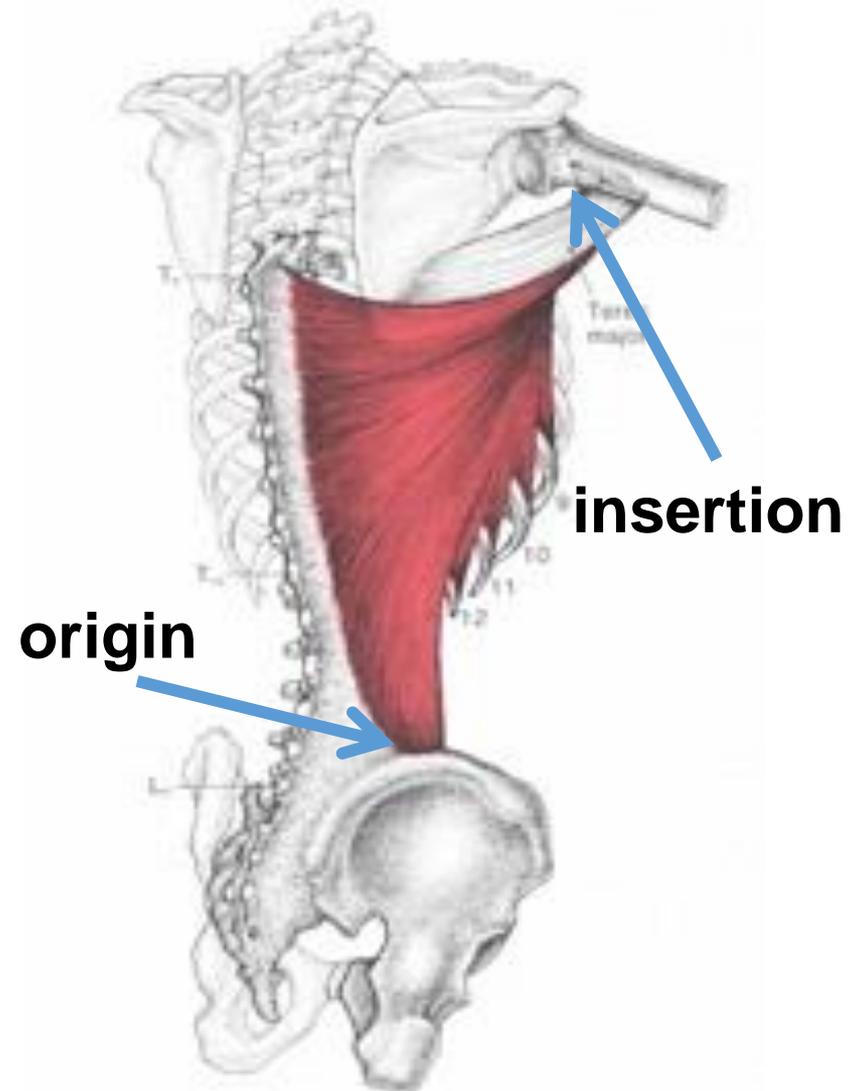
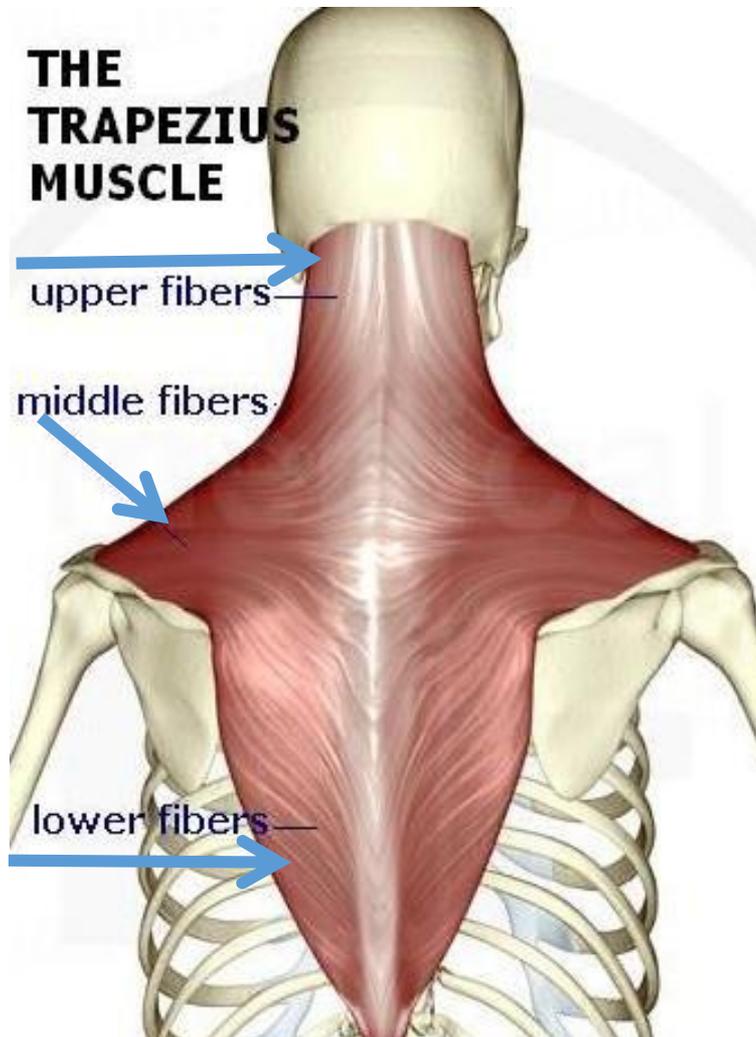
Treating the *cause* of the pain vs the symptom
and
restoring functional strength and movement.

Effective Treatment For Pain

- Patient Education
- Address Core Issue: Cause of Pain
- Improve Biomechanics
- Restore Neurofascial Efficiency
- Regain Muscle Symmetry
- Re-establish Functional Movement

SHOULDER PAIN

CORRECT BIOMECHANICS



SHOULDER PAIN

SI JOINT TREATMENT



SHOULDER PAIN

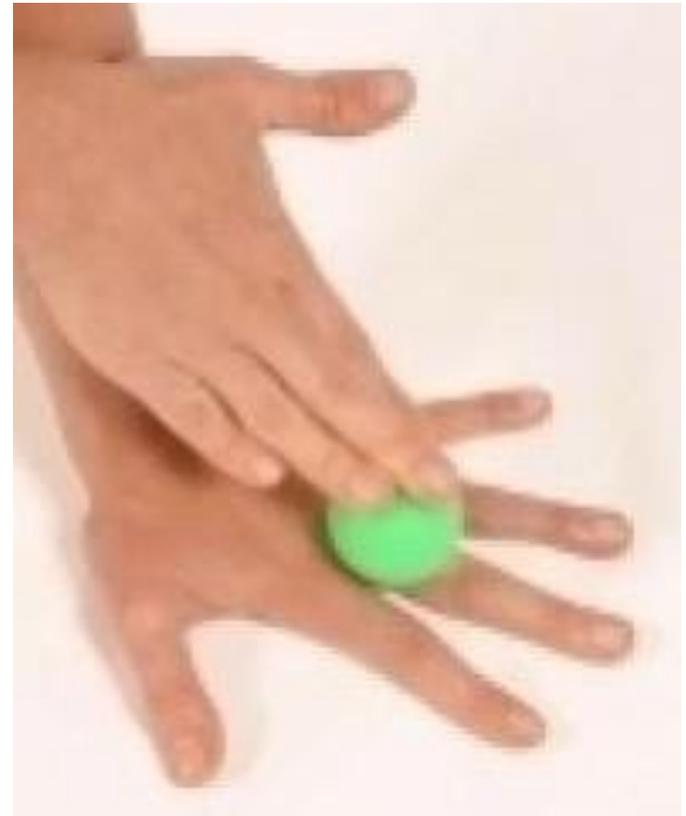
RESTORE MUSCLE FUNCTION



SHOULDER PAIN

RESTORE NEUROFASCIAL EFFICIENCY

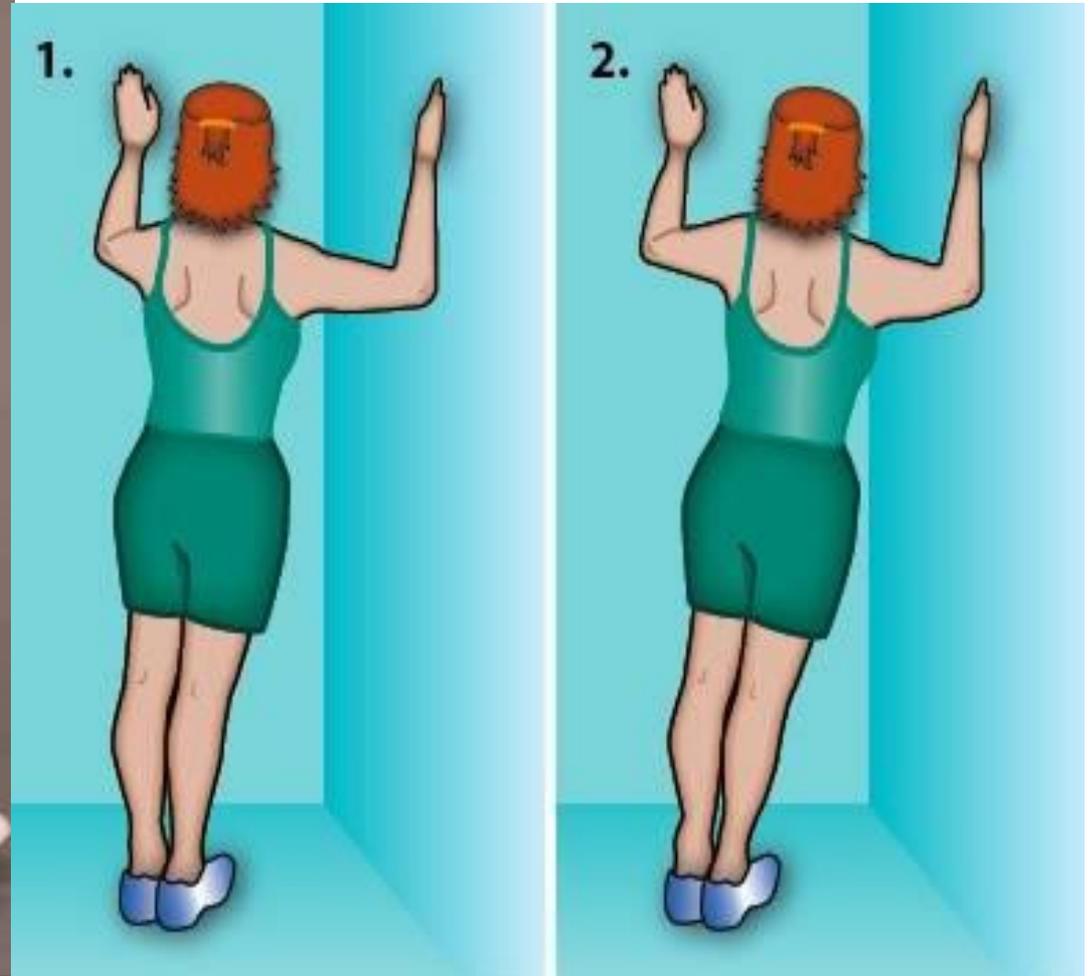
Hydrate & Lengthen connective tissue



SHOULDER PAIN



REGAIN MUSCLE SYMMETRY



SHOULDER PAIN

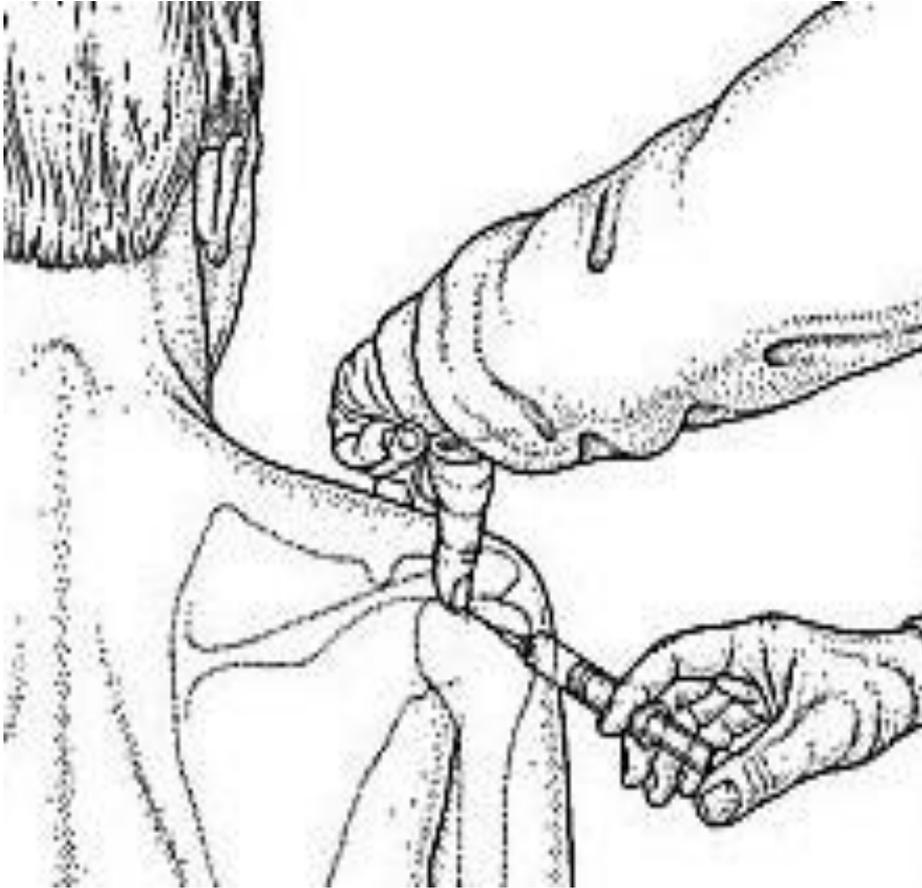
RE-ESTABLISH 3 PLANAR FUNCTION IN HIPS, RIBS, ANKLES



SHOULDER PAIN TREATMENT?

CORTICOSTEROID INJECTION

SIDE EFFECTS



- **Death of nearby bone (osteonecrosis)**
- **Joint infection**
- **Nerve damage**
- **Deterioration of cartilage**
- **Tendon weakening or rupture**
- **Thinning of nearby bone (osteoporosis)**

Corticosteroid Injections Versus Manual Physical Therapy for Treatment of Shoulder Impingement Syndrome

104 patients with symptoms of the shoulder impingement syndrome who did not have physical therapy or a corticosteroid injection within 3 months of enrolling in the study.

Ann Intern Med. 2014;161(3):l-22. doi:10.7326/P14-9024

Corticosteroid Injections vs. Manual Physical Therapy for Treatment of Shoulder Impingement

- randomly assigned to receive either manual PT 2x/week for 3 weeks or up to 3 corticosteroid injections during a one year follow up
- Questionnaires: shoulder pain and function before any treatments, during the study and 1, 3, 6, 12 months after treatment.
- whether the patients saw physicians/other health professionals or received additional procedures (radiography, physical therapy, or corticosteroid injections) for shoulder pain during the year after the study.

Ann Intern Med. 2014;161(3):l-22. doi:10.7326/P14-9024

Corticosteroid Injections vs. Manual Physical Therapy for Treatment of Shoulder Impingement

Manual Physical Therapy

- significant improvement in shoulder pain 1 month after treatment
- improvement continued for 1 year after treatment.

Corticosteroid Injections

- significant improvement in shoulder pain 1 month after treatment
- improvement continued for 1 year after treatment.
- During the 1-year follow-up, patients in they visited more physicians/health care professionals and had more procedures than the manual physical therapy group.

Manual Treatment Approach

- whole body assessment
- medical history
- accidents, falls, injuries, surgeries
- lifestyle: active vs sedentary, occupation, recreational activities
- patient education
- techniques and hep dependent on assessment not symptoms

Manual Therapy and Nutrition

- In many cases addressing the root cause of pain will resolve the issue and restore the body back to a balanced state BUT...
- What you eat has a profound effect on your body. Food can create inflammatory pain issues as well as chronic degenerative disease.

MANUAL TREATMENT APPROACH

PATIENT EDUCATION



MANUAL TREATMENT APPROACH

RESTORE FUNCTIONAL JOINT BIOMECHANICS



How to Access Quality Treatment for Pain

Locate a well trained professional:

- Physical therapist
- Massage therapist
- Athletic trainer
- Osteopathic physician
- Wellness Forum Health Network

MANUAL TECHNIQUES

- Muscle Energy Techniques
- Strain and Counterstrain
- Mobilization with Movement
- McConnell Techniques
- McKenzie Program
- Applied Functional Science:
Chain Reaction™
- Total Motion Release™
- Neurofascial Release: MELT® Method

MUSCLE ENERGY TECHNIQUES

Improve Biomechanics

- Biomechanics-based analytic diagnostic system.
- Uses precise procedures to identify and treat articular range-of-motion restriction.
- Developed ~50 years ago and is a widely performed osteopathic technique.
- Treats joint restrictions of the:
 - *spine*
 - *rib cage*
 - *pelvis*
 - *extremities*

STRAIN AND COUNTERSTRAIN

Improve Biomechanics

- Relieves false messages of continuing strain arising in dysfunctional proprioceptor reflexes.
- Applies a strain in the opposite direction of the false messages of strain.
- Passively shortening the muscle containing the false strain message stops the reporting strain.
- The body in normal positions can suffer this pain for years yet have it stopped in *ninety seconds* when placed passively in the opposite strain.

MOBILIZATION W/MOVEMENT

Improve Biomechanics

- Uses passive mobilization with active movement.
- Painfree: can restore comfortable mobility in just a few treatments.
- Immediate pain relief
- Increases in range of motion
- beneficial for any painful orthopedic condition with limited range of motion

MOBILIZATION W/MOVEMENT

Improve Biomechanics

Effective for:

- Cervicogenic Headaches
- Neck and Back Pain
- Shoulder Pain/Impingement
- Hip and Knee pain
- Ankle sprains
- Tennis Elbow

McConnell Techniques

Improve Biomechanics

- Evidence based approach
- LE, shoulder, low back dysfunction
- Beneficial effects of unloading soft tissue, often with tape, to immediately decrease pain and optimize treatment effects.

MCKENZIE PROGRAM

Improve Biomechanics

Three mechanical syndromes:

- *Postural*: End-range stress of normal structures
- *Dysfunction*: End-range stress of shortened structures (scarring, fibrosis, nerve root adherence)
- *Derangement*: Anatomical disruption or displacement within the motion segment

MCKENZIE PROGRAM

Improve Biomechanics

- Mechanical procedures utilizing movement and positions.
- Derangement syndrome with "centralization" is most common.

CORE CHAIN REACTION™

Re-establish Functional Movement

Applied Functional Science:

process for functional assessment, training/conditioning, rehabilitation, and injury prevention.

CORE CHAIN REACTION™

Re-establish Functional Movement

- Trains your body's true "core" – the nose to the toes – in all three planes of motion
- Trains in sagittal plane (forward and backward), frontal plane (side to side), and transverse plane (rotational) – in logical sequence.
- All movement is driven, or initiated, by anatomical drivers (i.e. – hand, foot, pelvis, etc.), which in turn, elicit a Chain Reaction™ throughout the body.

CORE CHAIN REACTION™

Re-establish Functional Movement

Gray Institute founded by Gary Gray

www.Grayinstitute.com

Free2Play Academy: a free, dynamic Movement Literacy program for all individuals of all abilities.

Movement Literacy: progressive and systematic development of an individual's functional abilities.

www.f2pacademy.com

TOTAL MOTION RELEASE®

Re-establish Functional Movement

Total Motion Release (TMR®) is an innovative paradigm used to evaluate and treat body motion imbalances that is related to the concept that the body is a unified system striving to maintain a dynamic center of gravity.

Therefore, pain or dysfunction in one area of the body may be affected by movements that take place elsewhere.

TOTAL MOTION RELEASE[®] Study

- To explore the effect of the Total Motion Release (TMR[®]) Trunk Twist (TT) and Arm Raise (AR) on IR and external rotation (ER) of the dominant shoulder in baseball players compared to a traditional dynamic warm-up.
- 10 male pitchers ~18 years of age, recruited from local baseball teams were randomly assigned to one of two groups: TMR[®] treatment group (TMRG; n = 5) or traditional warm-up group (TWG; n = 5).

Stephen C Gamma, CSCS, Russell T. Baker, DAT, AT, Steve Lorio, AT, Alan Nasypany, EdD, AT, and Jeff G. Seegmiller, EdD, AT. "A Total Motion Release Warm-up Improves Dominant Arm Shoulder Internal And External Rotation In Baseball Players." *Int J Sports Phys Ther.* 2014 Aug; 9(4): 509–517.

TOTAL MOTION RELEASE[®] Study

- TMR[®] produced larger increases in IR & ER of the throwing shoulder when compared to the TWG.
- In this study, Total Motion Release[®] appeared to be an effective, hands-free intervention for improving dominant shoulder ROM in the overhead throwing athlete when compared to a traditional warm-up protocol.
- The participants experienced statistically significant changes for IR and ER ROM that far exceeded the published expectations for improving shoulder ROM after utilizing TMR[®]...

NEUROFASCIAL RELEASE: MELT[®] METHOD

Restore Neurofascial Efficiency

MYOFASCIAL ENERGETIC LENGTH TECHNIQUE



The M.E.L.T. Method[®] is a self-treatment technique that stimulates the techniques – and the results – of manual treatment.

Neurofascial System

the interconnectedness of the nervous system and the connective tissue system, creating a whole-body communication network which serves to support, protect, and stabilize you in motion and at rest.



Connective Tissue

- Extensibility: adapts to spatial length to provide stability with movement
- Does *not* stretch like your muscles
- Provides tensional integrity or “Tensegrity”



Connective Tissue

- Adequate fluid is vital for efficient function of your connective tissue
- Inadequate fluid > collagen molecules collapse > adhesions > joint stiffness



MELT[®] METHOD

First Clinical Study for Back Pain

- Men/women, ages 25--65
- non--specific, chronic low back pain
- 22 subjects for MELT treatment group
- 22 subjects for control group



MELT[®] METHOD

First Clinical Study for Back Pain
2015 Fascia Research Congress

Significant decreased pain for MELT group

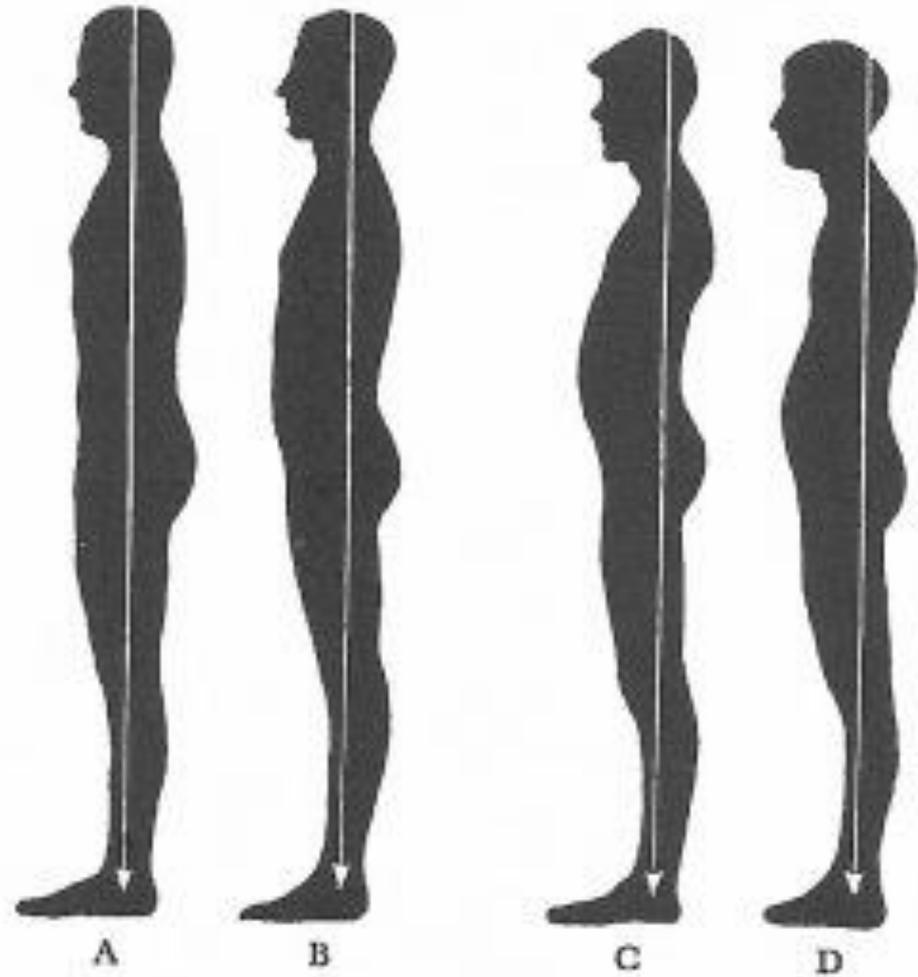
- 43% immediate
- 31% long term

Significant increase in flexibility

- +9% immediate
- +24% long term



Your body cannot be efficiently mobile if it is inefficiently stable.



The Bottom Line

- **Practice Dietary Excellence**
- **Exercise 4-5 times per week (weights/aerobic/stretching)**
- **MELT for efficient neurofascial function**
- **Find a practitioner who will look at your whole person and address the core problem, not just beat up the victim.**