

Pain is Not a Life Sentence: A Guide to Understanding and Eliminating Chronic Muscle, Joint, and Nerve Pain

-Images and references to accompany the audiobook-

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Anatomy illustrations by Henry Gray taken from the 20th edition of Gray's anatomy (1918)

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Chronic Pain Disorders

Central Sensitization

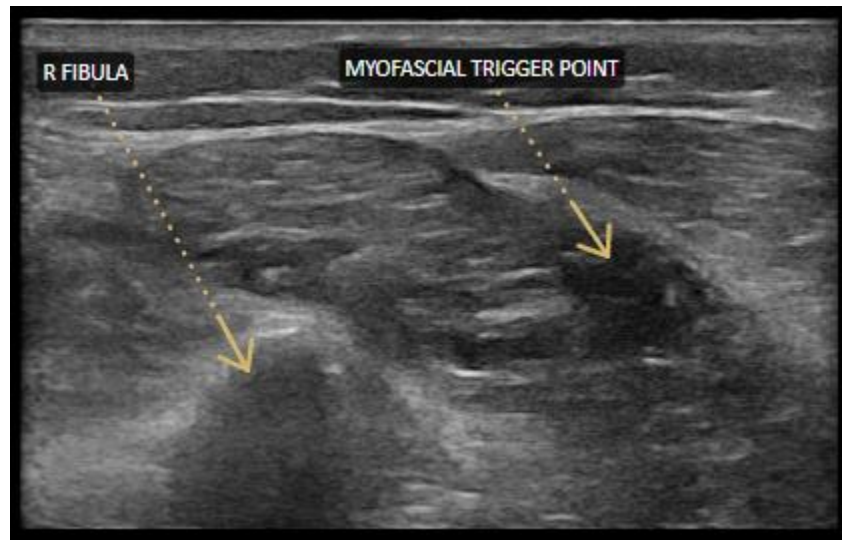
-The pain system's sensitivity can be ramped up directly by tissue damage or by the perceived danger of possible damage.¹



¹ Quartana PJ, Campbell CM, Edwards RR. Pain catastrophizing: a critical review. *Expert Rev Neurother.* 2009;9(5):745-758. [doi:10.1586/ern.09.34](https://doi.org/10.1586/ern.09.34)

² Used with permission. He did originally have some pain but his healthcare team told him his pain seemed more muscular and to try some exercises for a bit before surgery. This person had no back pain when I was last talking with him despite significant damage seen on the image. He has not had surgery and his favorite activity is golfing and he can swing a club just fine.

What are muscle knots and how do you get rid of them?



-Using crutches, limping, or developing odd movement patterns can create them. The exact process has been hypothesized to be a metabolic crisis,³ where the muscle has been asked to stay tight for too long and the individual cells are running out of energy and start screaming out in pain. Research seems to hint at a close relationship between painful MFTPs and central sensitization.⁴

-Sadly, I've found both clinically and in my searches through the literature that massage, stretching, heat, therapeutic ultrasound, TENS, and light therapy⁵ do not reliably resolve the issue (not that they don't provide some amount of relief). With experimentation, I found massage guns/machines work a bit better, but I find their results inconsistent person-to-person. Ischemic compression, dry needling, and extracorporeal shockwave therapy have all been shown to be reasonably effective.^{6,7}

³ Simons DG. New views of myofascial trigger points: etiology and diagnosis. *Arch Phys Med Rehabil.* 2008;89(1):157-159. [doi:10.1016/j.apmr.2007.11.016](https://doi.org/10.1016/j.apmr.2007.11.016)

⁴ Shah JP, Thaker N, Heimur J, Aredo JV, Sikdar S, Gerber L. Myofascial Trigger Points Then and Now: A Historical and Scientific Perspective. *PM R.* 2015;7(7):746-761. [doi:10.1016/j.pmrj.2015.01.024](https://doi.org/10.1016/j.pmrj.2015.01.024)

⁵ Fagundes MG, Albuquerque JR dos S, Silva EJS, Dantas ACV, Lima TBW e. The effects of low-level laser in the treatment of myofascial pain syndrome: systematic review. *BrJP.* 2023;6(1):83-89. [doi:10.5935/2595-0118.20230014-en](https://doi.org/10.5935/2595-0118.20230014-en)

⁶ Xu A, Huang Q, Rong J, Wu X, Deng M, Ji L. Effectiveness of ischemic compression on myofascial trigger points in relieving neck pain: A systematic review and meta-analysis. *J Back Musculoskelet Rehabil.* 2023;36(4):783-798. [doi:10.3233/BMR-220045](https://doi.org/10.3233/BMR-220045)

⁷ Zhang Q, Fu C, Huang L, et al. Efficacy of Extracorporeal Shockwave Therapy on Pain and Function in Myofascial Pain Syndrome of the Trapezius: A Systematic Review and Meta-Analysis. *Arch Phys Med Rehabil.* 2020;101(8):1437-1446. [doi:10.1016/j.apmr.2020.02.013](https://doi.org/10.1016/j.apmr.2020.02.013)

Does Arthritis Cause Pain?

- In one study on hips in those aged 45-65, they found the prevalence of arthritis in those with hip pain was 13.3% and in those with no hip pain to be 9.5%. They concluded that diagnosing arthritis on X-ray has little use to determine the cause of pain since arthritis is so common in the asymptomatic (pain free).⁸
- Study after study finds that, statistically, pain scores and ability to function improves for people with arthritis when people do exercises/physiotherapy. The arthritis doesn't go away but they feel and perform better.^{9,10}
- In one study involving squats (the exercise most people with knee pain avoid) they found there was significant improvement in pain relief, range of motion, muscle strength, and knee stability.¹¹
- Even degenerative rotator cuff tears in the shoulder might be pain free. If a radiologist sees a tear on the MRI, there is no guarantee the tear is actually painful.¹²
- One third of adults over the age of thirty with no back pain have a disc herniation on MRI.¹³

Do Cortisone/Steroid Injections Help?

- There is an overprescription problem with opioids, proton pump inhibitors, antidepressants, antibiotics, etc.^{14,15} and similarly, injections are also overutilized.
- Cortisone may not be that good of a pain reliever anyway as it may be no better than placebo for back pain.¹⁶

⁸ Rondas GA, Macri EM, Oei EH, Bierma-Zeinstra SM, Rijkels-Otters HB, Runhaar J. Association between hip pain and radiographic hip osteoarthritis in primary care: the CHECK cohort. *Br J Gen Pract.* 2022;72(723):e722-e728. [doi:10.3399/BJGP.2021.0547](https://doi.org/10.3399/BJGP.2021.0547)

⁹ Golightly YM, Allen KD, Caine DJ. A comprehensive review of the effectiveness of different exercise programs for patients with osteoarthritis. *Phys Sportsmed.* 2012;40(4):52-65. [doi:10.3810/psm.2012.11.1988](https://doi.org/10.3810/psm.2012.11.1988)

¹⁰ Raposo, F., Ramos, M., & Lúcia Cruz, A. Effects of exercise on knee osteoarthritis: A systematic review. *Musculoskeletal Care.* 2021;19(4), 399–435. <https://doi.org/10.1002/msc.1538>

¹¹ Zhao Z, Wang R, Guo Y, et al. Static Low-Angle Squatting Reduces the Intra-Articular Inflammatory Cytokines and Improves the Performance of Patients with Knee Osteoarthritis. *Biomed Res Int.* 2019;2019:9617923. Published 2019, Oct 30. [doi:10.1155/2019/9617923](https://doi.org/10.1155/2019/9617923)

¹² Minagawa H, Yamamoto N, Abe H, et al. Prevalence of symptomatic and asymptomatic rotator cuff tears in the general population: From mass-screening in one village. *J Orthop.* 2013;10(1):8-12. Published 2013, Feb 26. [doi:10.1016/j.jor.2013.01.008](https://doi.org/10.1016/j.jor.2013.01.008)

¹³ See the back section for more information.

¹⁴ Safer DJ. Overprescribed Medications for US Adults: Four Major Examples. *J Clin Med Res.* 2019;11(9):617-622. [doi:10.14740/jocmr3906](https://doi.org/10.14740/jocmr3906)

¹⁵ Heidelbaugh JJ, Kim AH, Chang R, Walker PC. Overutilization of proton-pump inhibitors: what the clinician needs to know. *Therap Adv Gastroenterol.* 2012;5(4):219-232. [doi:10.1177/1756283X12437358](https://doi.org/10.1177/1756283X12437358)

¹⁶ Bogduk N. A narrative review of intra-articular corticosteroid injections for low back pain. *Pain Med.* 2005;6(4):287-296. [doi:10.1111/j.1526-4637.2005.00048.x](https://doi.org/10.1111/j.1526-4637.2005.00048.x)

-Cortisone will thin cartilage, weaken tendons and ligaments, make skin thinner, and can even weaken bones. They increase the likelihood of tendon tears and increase the progression of arthritis.^{17,18}

-There are some particular pathologies like “trigger finger” where a single injection can resolve the issue entirely.¹⁹

-Ultrasound imaging guided injections can have better outcomes as the physician can make sure that the injection is going exactly where it needs to go.²⁰

-I would not even consider an injection of cortisone without ultrasound guidance except in the most swollen of cases. For the temporary pain relief (although possibly more pain later) cortisone can be placed on top of a tendon but should never be injected into a tendon as cortisone damages tenocytes, the cells that maintain and heal tendons.²¹

¹⁷ Brinks A, Koes BW, Volkers AC, Verhaar JA, Bierma-Zeinstra SM. Adverse effects of extra-articular corticosteroid injections: a systematic review. *BMC Musculoskelet Disord*. 2010;11:206. Published 2010 Sep 13. [doi:10.1186/1471-2474-11-206](https://doi.org/10.1186/1471-2474-11-206)

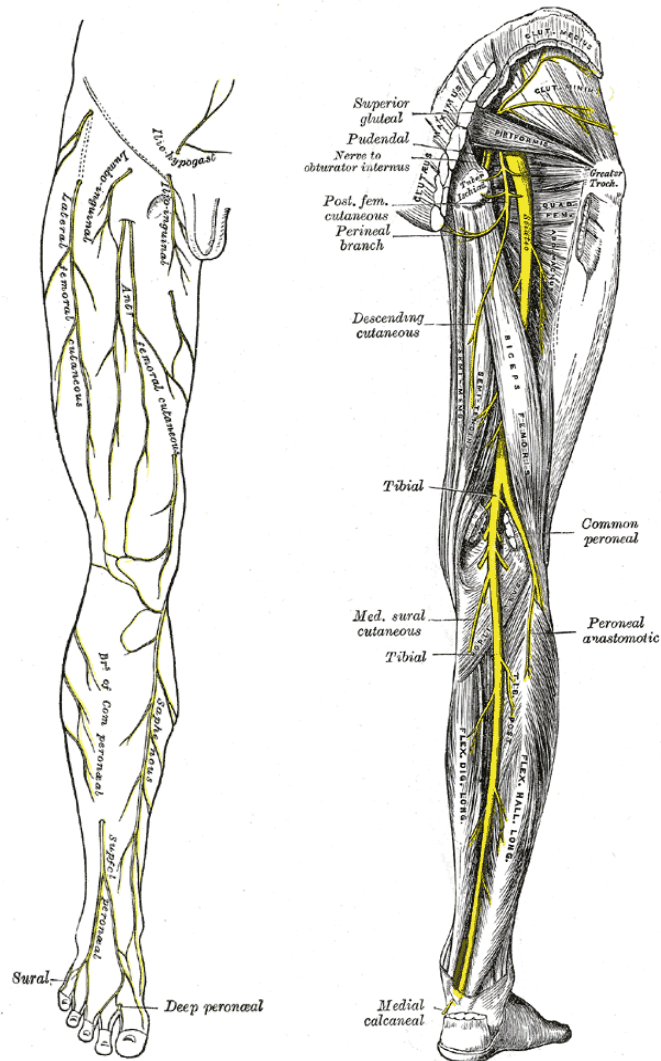
¹⁸ Grillet B, Dequeker J. Intra-articular steroid injection. A risk-benefit assessment. *Drug Saf*. 1990;5(3):205-211. [doi:10.2165/00002018-199005030-00005](https://doi.org/10.2165/00002018-199005030-00005)

¹⁹ Dala-Ali BM, Nakhdeh A, Lloyd MA, Schreuder FB. The efficacy of steroid injection in the treatment of trigger finger. *Clin Orthop Surg*. 2012;4(4):263-268. [doi:10.4055/cios.2012.4.4.263](https://doi.org/10.4055/cios.2012.4.4.263)

²⁰ Sibbitt WL Jr, Kettwich LG, Band PA, et al. Does ultrasound guidance improve the outcomes of arthrocentesis and corticosteroid injection of the knee? . *Scand J Rheumatol*. 2012;41(1):66-72. [doi:10.3109/03009742.2011.599071](https://doi.org/10.3109/03009742.2011.599071)

²¹ Spang C, Chen J, Backman LJ. The tenocyte phenotype of human primary tendon cells in vitro is reduced by glucocorticoids. *BMC Musculoskelet Disord*. 2016;17(1):467. Published 2016 Nov 10. [doi:10.1186/s12891-016-1328-9](https://doi.org/10.1186/s12891-016-1328-9)

Why is nerve pain so stubborn?



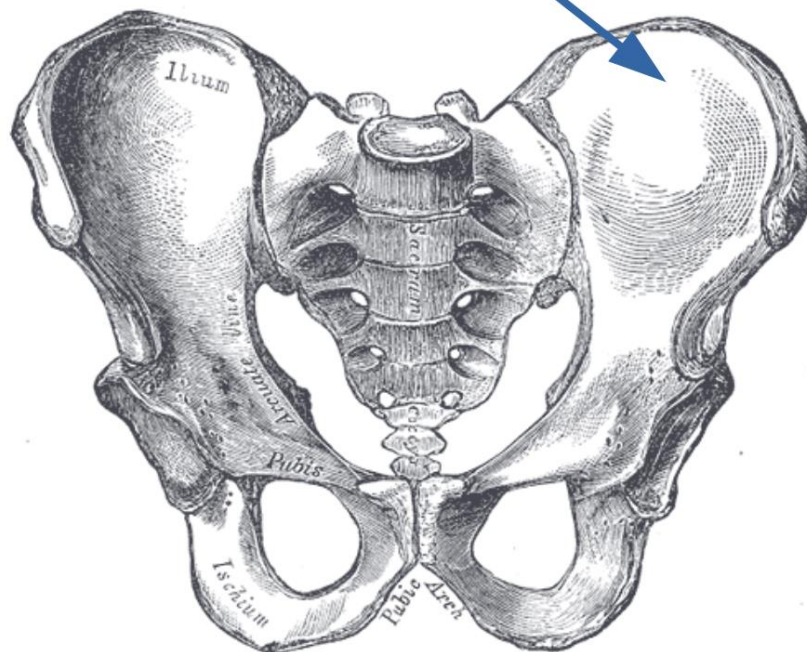
-Sixty percent of chemotherapy patients experience neuropathy (nerve problems), but luckily 6 months later that number decreases to 30%.²²

²² Seretny M, Currie GL, Sena ES, et al. Incidence, prevalence, and predictors of chemotherapy-induced peripheral neuropathy: A systematic review and meta-analysis. *Pain*. 2014;155(12):2461-2470. [doi:10.1016/j.pain.2014.09.020](https://doi.org/10.1016/j.pain.2014.09.020)

Bad Posture and Other Bad Habits



The “wings” of the pelvis are called the ilia (ilium singular)



Here are instructions for Brugger's relief position:

- Sit up tall as if you are being pulled up by a thread attached to the top of your head. Chin is tucked slightly.
- Make sure your pelvis is tilted such that you have a gentle inward curve in your low back (neutral pelvis).
- Pull your shoulder blades down.
- Rotate your arms outwards. Make sure you aren't overextending your back. You may have to lightly engage your abdominals.
- Hold for 5-20 seconds. Repeat if necessary.
- Repeat the procedure as needed throughout the day such as every hour of office work.



Are Support Braces Helpful?

- About 90% of people have one leg a bit longer than the other with the average being about 5mm.²³
- Double heel lifts or wedge shoes may help with Achilles (posterior ankle) tendon pain during the recovery process.²⁴
- Orthotics are a big business (more than 3 billion USD).²⁵
- There have been many pillow studies (mostly of low quality) and many (but not all) found no correlation between symptoms and pillow types.^{26,27}

²³ Knutson GA. Anatomic and functional leg-length inequality: a review and recommendation for clinical decision-making. Part I, anatomic leg-length inequality: prevalence, magnitude, effects and clinical significance. *Chiropr Osteopat*. 2005;13:11. Published 2005, Jul 20. [doi:10.1186/1746-1340-13-11](https://doi.org/10.1186/1746-1340-13-11)

²⁴ Rabusin CL, Menz HB, McClelland JA, et al. Efficacy of heel lifts versus calf muscle eccentric exercise for mid-portion Achilles tendinopathy (HEALTHY): a randomised trial. *Br J Sports Med*. 2021;55(9):486-492. [doi:10.1136/bjsports-2019-101776](https://doi.org/10.1136/bjsports-2019-101776)

²⁵ <https://www.fortunebusinessinsights.com/industry-reports/foot-orthotic-insoles-market-100348>

²⁶ Gordon SJ, Grimmer KA, Buttner P. Pillow preferences of people with neck pain and known spinal degeneration: a pilot randomized controlled trial. *Eur J Phys Rehabil Med*. 2019;55(6):783-791. [doi:10.23736/S1973-9087.19.05263-8](https://doi.org/10.23736/S1973-9087.19.05263-8)

²⁷ Shields N, Capper J, Polak T, Taylor N. Are cervical pillows effective in reducing neck pain? *New Zealand Journal of Physiotherapy* 2006; 34(1): 3-9. <https://www.ncbi.nlm.nih.gov/books/NBK73379/>

Is it because of my weak core?

-Poor proprioception (sense of where the joint is and what it is doing) increased the likelihood of women injuring their knee by 2-3 times on average.²⁸

-If it was just about endurance and strength why would Tai Chi be so effective for back pain, even when compared with core workouts?^{29,30}

How to Exercise/Rehab properly?

-The combination of increased protein intake and resistance exercises (weights, body weight, and/or resistance bands) has been found to increase muscle mass in even those 65+.³¹

-Stretching doesn't have the health benefits of other forms of physical activity: it doesn't improve heart health, reduce diabetes risk, improve lean body mass, improve balance, improve muscle coordination, improve strength, etc.³²



²⁸ Zazulak BT, Hewett TE, Reeves NP, Goldberg B, Cholewicki J. The effects of core proprioception on knee injury: a prospective biomechanical-epidemiological study. *Am J Sports Med.* 2007;35(3):368-373. [doi:10.1177/0363546506297909](https://doi.org/10.1177/0363546506297909)

²⁹ Zou L, Zhang Y, Liu Y, et al. The Effects of Tai Chi Chuan Versus Core Stability Training on Lower-Limb Neuromuscular Function in Aging Individuals with Non-Specific Chronic Lower Back Pain. *Medicina (Kaunas).* 2019;55(3):60. Published 2019 Mar 3. [doi:10.3390/medicina55030060](https://doi.org/10.3390/medicina55030060)

³⁰ Wang X-Q, Xiong H-Y, Du S-H, Yang Q-H and Hu L (2022) The effect and mechanism of traditional Chinese exercise for chronic low back pain in middle-aged and elderly patients: A systematic review. *Front. Aging Neurosci.* 14:935925. [doi: 10.3389/fnagi.2022.935925](https://doi.org/10.3389/fnagi.2022.935925)

³¹ Voulgaridou G, Papadopoulou SD, Spanoudaki M, et al. Increasing Muscle Mass in Elders through Diet and Exercise: A Literature Review of Recent RCTs. *Foods.* 2023;12(6):1218. Published 2023 Mar 13. [doi:10.3390/foods12061218](https://doi.org/10.3390/foods12061218)

³² Physical activity guidelines by the American government department of health and human services: https://health.gov/sites/default/files/2019-09/Physical_Activity_Guidelines_2nd_edition.pdf



Chronic Tendon Pain (tendinosis)

-Similarly, PRP or dextrose injections may both help as they can encourage healing. Avoid cortisone injections, as this will weaken the tendon further, even if it does provide some short-term relief. Red light therapy and/or extracorporeal shockwave therapy might be useful. Exercises are the most common and consistently effective form of treatment.³³

Fibromyalgia

-Nowadays, the diagnosis is made with a questionnaire the patient answers.³⁴
 -The more overweight you are, the worse it is.³⁵
 -Diet changes can help with a lot of these things and, sure enough, reduced calorie, low FODMAP, and raw vegetarian diets improved quality of life, quality of sleep, anxiety, depression, and/or inflammatory biomarkers in some people diagnosed with fibromyalgia.³⁶

³³ Irby A, Gutierrez J, Chamberlin C, Thomas SJ, Rosen AB. Clinical management of tendinopathy: A systematic review of systematic reviews evaluating the effectiveness of tendinopathy treatments. *Scand J Med Sci Sports*. 2020;30(10):1810-1826. [doi:10.1111/sms.13734](https://doi.org/10.1111/sms.13734)

³⁴ Fibromyalgia questionnaire: <https://www.rcplondon.ac.uk/file/36231/download>

³⁵ Núñez-Nevárez K, López-Betancourt A, Cisneros-Pérez V, et al. Relationship Between Weight and Severity of Fibromyalgia. *Mo Med*. 2023; [120\(1\):83-88](https://doi.org/10.1080/07853890.2018.1564360).

³⁶ Silva AR, Bernardo A, Costa J, et al. Dietary interventions in fibromyalgia: a systematic review. *Ann Med*. 2019;51(sup1):2-14. [doi:10.1080/07853890.2018.1564360](https://doi.org/10.1080/07853890.2018.1564360)

Hypermobility

-This presentation is common in any chronic pain syndrome but, counterintuitively, hypermobile people are at an increased risk.³⁷

A Bit about Research in Healthcare

-I read a research paper recently studying the effect of custom heel-lift orthotics on back pain.³⁸ One hundred percent of people had no back pain when they checked on them 2 years later.

-If you look at more studies you will get a better picture that orthotics have no effect or a small effect on back pain depending on the study.³⁹

-The preponderance of evidence strongly suggests it is no more effective than a placebo, inferior to other treatments, or at best similar to a hot pack.^{40,41,42}

-Some physios either aren't up to date on the research, are using it instead of a hot pack, or for the placebo effect. Antidepressants, particularly SSRI's, are now well understood to have little benefit over placebo for the mild and moderate depression patients (approximately 90% of depression), have a risk of adverse events, and may result in withdrawal symptoms when trying to stop.⁴³

-But you can't prescribe a placebo, so what is the doctor supposed to do?⁴⁴

-Research would suggest avoiding using cortisone unless absolutely necessary for tendon pain because even if it does give relief, it is short term only and cortisone is bad for tendon health but doctors still often use it.⁴⁵

³⁷ Scheper MC, de Vries JE, Verbunt J, Engelbert RH. Chronic pain in hypermobility syndrome and Ehlers-Danlos syndrome (hypermobility type): it is a challenge. *J Pain Res.* 2015;8:591-601. Published 2015 Aug 20. [doi:10.2147/JPR.S64251](https://doi.org/10.2147/JPR.S64251)

³⁸ D'Amico M, Kinel E and Roncoletta P (2022) Leg Length Discrepancy and Nonspecific Low Back Pain: 3-D Stereophotogrammetric Quantitative Posture Evaluation Confirms Positive Effects of Customized Heel-Lift Orthotics. *Front. Bioeng. Biotechnol.* 9:743132. [doi: 10.3389/fbioe.2021.743132](https://doi.org/10.3389/fbioe.2021.743132)

³⁹ Chuter, V., Spink, M., Searle, A. et al. The effectiveness of shoe insoles for the prevention and treatment of low back pain: a systematic review and meta-analysis of randomised controlled trials. *BMC Musculoskelet Disord* 15, 140 (2014). <https://doi.org/10.1186/1471-2474-15-140>

⁴⁰ Haile G, Hailemariam TT, Haile TG. Effectiveness of Ultrasound Therapy on the Management of Chronic Non-Specific Low Back Pain: A Systematic Review. *J Pain Res.* 2021;14:1251-1257. Published 2021 May 17. [doi:10.2147/JPR.S277574](https://doi.org/10.2147/JPR.S277574)

⁴¹ Freiwald J, Magni A, Fanlo-Mazas P, et al. A Role for Superficial Heat Therapy in the Management of Non-Specific, Mild-to-Moderate Low Back Pain in Current Clinical Practice: A Narrative Review. *Life (Basel).* 2021;11(8):780. Published 2021 Aug 2. [doi:10.3390/life11080780](https://doi.org/10.3390/life11080780)

⁴² Aiyer R, Noori SA, Chang KV, et al. Therapeutic Ultrasound for Chronic Pain Management in Joints: A Systematic Review. *Pain Med.* 2020;21(7):1437-1448. [doi:10.1093/pm/pnz102](https://doi.org/10.1093/pm/pnz102)

⁴³ Yuan Z, Chen Z, Xue M, Zhang J, Leng L. Application of antidepressants in depression: A systematic review and meta-analysis. *J Clin Neurosci.* 2020;80:169-181. [doi:10.1016/j.jocn.2020.08.013](https://doi.org/10.1016/j.jocn.2020.08.013)

⁴⁴ "St. John's wort" has similar effectiveness to SSRI's for depression with fewer side effects and doesn't require a prescription. <https://publix.aisle7.net/publix/us/assets/nutritional-supplement/st-johns-wort/> See the SSRI section later in the book for more information. Exercise and counseling work well too.

⁴⁵ Coombes BK, Bisset L, Vicenzino B. Efficacy and safety of corticosteroid injections and other injections for management of tendinopathy: a systematic review of randomised controlled trials. *Lancet.* 2010;376(9754):1751-1767. [doi:10.1016/S0140-6736\(10\)61160-9](https://doi.org/10.1016/S0140-6736(10)61160-9)

Chiropractors

-I think osteoarthritis should be renamed to “normal age-related bony changes” due to the poor correlation with pain and the high likelihood of finding it in pain-free joints.⁴⁶

-Here the term medicine is used as “the science or practice of the diagnosis, treatment, and prevention of disease”⁴⁷ instead of as a synonym for drugs.

Doctors of Traditional Chinese Medicine (Acupuncturists)

-Acupuncture has some evidence to support its use for musculoskeletal pain relief and is sometimes even covered by medical insurance.⁴⁸

Psychologists/Psychiatrists/Counselors

-The academic literature is all over the place as every study uses different measurements and different treatment protocols, but the overarching consensus is that it helps, at least a subset of people, with reducing anxiety and pain while increasing functional capacity.^{49,50}

Medical Doctors

-A pet peeve of mine in obstetrics: inducing labor with Pitocin or stirrup use for delivery aren't better for the patient!^{51,52}

⁴⁶ I want to be clear that sometimes the findings on X-ray or MRI do explain the pain. There is an increased likelihood of pain statistically if there is nasty stuff on your images but the increased likelihood may be much less than you would expect.

⁴⁷ Merriam-Webster. (n.d.). Medicine. In Merriam-Webster.com dictionary. Retrieved July 4, 2023, from <https://www.merriam-webster.com/dictionary/medicine>

⁴⁸ See the treatment section of this book for more information.

⁴⁹ Başak, İ. N. C. E. . Systematic Review of the Comparative Effectiveness of Cognitive-Behavioural Therapies for Chronic Pain. *Journal of Cognitive-Behavioral Psychotherapy and Research*, 2020:9(3); 248-248.

⁵⁰ Chao YS, Ford C. Cognitive Behavioural Therapy for Chronic Non-Cancer Pain: A Review of Clinical Effectiveness [Internet]. *Ottawa (ON): Canadian Agency for Drugs and Technologies in Health*; 2019 Sep 16. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK549547/>

⁵¹ <https://evidencebasedbirth.com/evidence-birthing-positions/>

⁵² Espada-Trespalacios X, Ojeda F, Perez-Botella M, et al. Oxytocin Administration in Low-Risk Women, a Retrospective Analysis of Birth and Neonatal Outcomes. *Int J Environ Res Public Health*. 2021;18(8):4375. Published 2021 Apr 20. [doi:10.3390/ijerph18084375](https://doi.org/10.3390/ijerph18084375)

Pain Management Specialists

-note: There are some countries that do have pain management as an official specialty, but you still don't know what you are getting in each country as eligible professions and training varies from country to country.^{53,54}

Applied Kinesiology

-For structural problems, it can work (testing pelvis muscle strength can be a good indicator as to whether there is a problem in the pelvis) and muscle strength testing is standard in neurological and orthopedic exams.⁵⁵

-The other aspects of AK have no foundation in science.... When double-blinded studies are done, this evaluation is no better than random chance for diagnosis.⁵⁶

Red Light Therapy



-Although the research is of fairly low quality in general, it has relatively strong evidence for help with inflammation from an acute injury (ankle sprain, tendon tear, etc.).⁵⁷

⁵³ Hochberg U, Sharon H, Bahir I, Brill S. Pain Management - A Decade's Perspective of a New Subspecialty. *J Pain Res.* 2021;14:923-930. Published 2021 Apr 9. [doi:10.2147/JPR.S303815](https://doi.org/10.2147/JPR.S303815)

⁵⁴ [Status of Pain Management and Credentialing](#)

⁵⁵ Estrázulas JA, Bueno LS, Lombardi LRO, Estrázulas JA, Fernandes TG, Baltar JA. Accuracy of the Applied Kinesiology Muscle Strength Test for Sacroiliac Dysfunction. *Rev Bras Ortop* (Sao Paulo). 2020;55(3):293-297. [doi:10.1055/s-0039-1700832](https://doi.org/10.1055/s-0039-1700832)

⁵⁶ Schwartz SA, Utts J, Spottiswoode SJ, et al. A double-blind, randomized study to assess the validity of applied kinesiology (AK) as a diagnostic tool and as a nonlocal proximity effect. *Explore* (NY). 2014;10(2):99-108. [doi:10.1016/j.explore.2013.12.002](https://doi.org/10.1016/j.explore.2013.12.002)

⁵⁷ Stergioulas A, Low-Level Laser Treatment Can Reduce Edema in Second Degree Ankle Sprains. *Journal of Clinical Laser Medicine & Surgery.* Apr 2004. 125-128. [http://doi.org/10.1089/104454704774076181](https://doi.org/10.1089/104454704774076181)

-For more chronic issues, the quality of the evidence is also low, but some studies have found a small effect.⁵⁸

-Since the price has come down so far, it is a reasonable purchase to add to a family's first aid kit. It doesn't hurt to try it to treat a tendinosis or chronic joint pain.⁵⁹

Therapeutic Ultrasound



-In study after study, it has failed to be more effective than placebo or, in cases where it is better than placebo, there are much better alternatives.^{60,61}

-For some very specific conditions, it is effective, like for calcific tendinitis.^{62,63}

⁵⁸ Tripodi, N., Feehan, J., Husaric, M. et al. The effect of low-level red and near-infrared photobiomodulation on pain and function in tendinopathy: a systematic review and meta-analysis of randomized control trials. *BMC Sports Sci Med Rehabil* 13, 91 (2021). <https://doi.org/10.1186/s13102-021-00306-z>

⁵⁹ Jan M Bjordal, Christian Couppé, Roberta T Chow, Jan Tunér, Elisabeth Anne Ljunggren, A systematic review of low level laser therapy with location-specific doses for pain from chronic joint disorders, *Australian Journal of Physiotherapy*, Volume 49, Issue 2, 2003, Pages 107-116, ISSN 0004-9514, [https://doi.org/10.1016/S0004-9514\(14\)60127-6](https://doi.org/10.1016/S0004-9514(14)60127-6)

⁶⁰ Robertson VJ, Baker KG. A review of therapeutic ultrasound: effectiveness studies. *Phys Ther.* 2001;81(7):1339-1350.

⁶¹ Aiyer R, Noori SA, Chang KV, et al. Therapeutic Ultrasound for Chronic Pain Management in Joints: A Systematic Review. *Pain Med.* 2020;21(7):1437-1448. [doi:10.1093/pm/pnz102](https://doi.org/10.1093/pm/pnz102)

⁶² Shomoto K, Takatori K, Morishita S, et al. Effects of ultrasound therapy on calcificated tendinitis of the shoulder. *J Jpn Phys Ther Assoc.* 2002;5(1):7-11. [doi:10.1298/jjpta.5.7](https://doi.org/10.1298/jjpta.5.7)

⁶³ Čota S, Delimar V, Žagar I, et al. Efficacy of therapeutic ultrasound in the treatment of chronic calcific shoulder tendinitis: a randomized trial. *Eur J Phys Rehabil Med.* 2023;59(1):75-84. [doi:10.23736/S1973-9087.22.07715-2](https://doi.org/10.23736/S1973-9087.22.07715-2)

Extracorporeal Shockwave Therapy



- This treatment has been well established to help with bone healing, and there are signs it can help with soft tissue issues as well.⁶⁴
- There is some early evidence it helps with tendon healing/strengthening/reconditioning, so it likely helps with calcific tendinitis, tendinosis, and plantar fasciosis/fasciitis.^{65,66}
- It may be dose dependent, though, so a weaker/shorter dose might not be as effective, and it may be best paired with other treatments.⁶⁷
- There is one study that found it was also effective at treating nasty muscle knots (but not more effective than ischemic compression).⁶⁸

⁶⁴ Sansone V, Ravier D, Pascale V, Applefield R, Del Fabbro M, Martinelli N. Extracorporeal Shockwave Therapy in the Treatment of Nonunion in Long Bones: A Systematic Review and Meta-Analysis. *J Clin Med*. 2022;11(7):1977. Published 2022 Apr 1. [doi:10.3390/jcm11071977](https://doi.org/10.3390/jcm11071977)

⁶⁵ Korakakis V, Whiteley R, Tzavara A, et al. The effectiveness of extracorporeal shockwave therapy in common lower limb conditions: a systematic review including quantification of patient-rated pain reduction. *British Journal of Sports Medicine* 2018;52:387-407.

⁶⁶ Feeney KM. The Effectiveness of Extracorporeal Shockwave Therapy for Midportion Achilles Tendinopathy: A Systematic Review. *Cureus*. 2022;14(7):e26960. Published 2022 Jul 18. [doi:10.7759/cureus.26960](https://doi.org/10.7759/cureus.26960)

⁶⁷ Speed C. A systematic review of shockwave therapies in soft tissue conditions: focusing on the evidence. *Br J Sports Med*. 2014;48(21):1538-1542. [doi:10.1136/bjsports-2012-091961](https://doi.org/10.1136/bjsports-2012-091961)

⁶⁸ Lee CH, Lee SU. Usefulness of Extracorporeal Shockwave Therapy on Myofascial Pain Syndrome. *Ann Rehabil Med*. 2021;45(4):261-263. [doi:10.5535/arm.21128](https://doi.org/10.5535/arm.21128)

Electrical Stimulation



- TENS numbs the nerves effectively reducing pain without drugs.⁶⁹
- Interferential Current is a better version of TENS because it does what TENS does but in a more comfortable way.⁷⁰
- In the short term, I use Russian stim to keep the muscle from wasting away entirely. It can help with retraining as well as the patient can try to move the muscle at the same time as the electricity activates helping to retrain the brain to use the muscle to improve strength and performance.⁷¹

Hot/cold

- Sauna therapy has had the most research. For at least some types of chronic pain, it offers immediate relief and the benefits might be long lasting.^{72,73}

⁶⁹ Johnson MI, Paley CA, Jones G, Mulvey MR, Wittkopf PG. Efficacy and safety of transcutaneous electrical nerve stimulation (TENS) for acute and chronic pain in adults: a systematic review and meta-analysis of 381 studies (the meta-TENS study). *BMJ Open*. 2022;12(2):e051073. Published 2022 Feb 10. [doi:10.1136/bmjopen-2021-051073](https://doi.org/10.1136/bmjopen-2021-051073)

⁷⁰ Hussein HM, Alshammari RS, Al-Barak SS, Alshammari ND, Alajlan SN, Althomali OW. A Systematic Review and Meta-analysis Investigating the Pain-Relieving Effect of Interferential Current on Musculoskeletal Pain. *Am J Phys Med Rehabil*. 2022;101(7):624-633. [doi:10.1097/PHM.0000000000001870](https://doi.org/10.1097/PHM.0000000000001870)

⁷¹ Wang TJ, Sung K, Wilburn M, Allbright J. Russian Stimulation/Functional Electrical Stimulation in the Treatment of Foot Drop Resulting from Lumbar Radiculopathy: A Case Series. *Innov Clin Neurosci*. 2019;16(5-6):46-49.

⁷² Hussain J, Cohen M. Clinical Effects of Regular Dry Sauna Bathing: A Systematic Review. *Evid Based Complement Alternat Med*. 2018;2018:1857413. [doi:10.1155/2018/1857413](https://doi.org/10.1155/2018/1857413)

⁷³ Cho EH, Kim NH, Kim HC, Yang YH, Kim J, Hwang B. Dry sauna therapy is beneficial for patients with low back pain. *Anesth Pain Med (Seoul)*. 2019;14(4):474-479. [doi:10.17085/apm.2019.14.4.474](https://doi.org/10.17085/apm.2019.14.4.474)

-For whole-body cryotherapy, which is much newer, the research is lacking but there are some positive findings.^{74,75}

Ischemic Compression



You can visit triggerpoints.net for a map to get an idea of where they could be or refer to the rest of this book as I'll point out some of the more common ones. Once you have identified the point, the treatment is as follows:

- You compress the MFTP until pain reaches about a 5/10.
- Within 60 seconds, the pain should drop if you are in the right place and have the right diagnosis.
- Once the pain drops, increase the pressure until pain goes back to 5/10.
- Within 30 seconds, the pain should drop again.
- Increase the pressure again repeating the cycle until the pain stops dropping, it feels like you are just pushing into the bone, or the patient says they only feel pressure.
- Once you release, they should be able to immediately feel a difference.
- Recheck next to where you were working and in the general area to see if there are more spots to treat, particularly if there was still some pain in the last phase of the treatment.
- Repeat the process, if necessary, on subsequent days. You may skip a day if the area is a bit throbbing/achy from treatment the day before.

⁷⁴ Garcia C, Karri J, Zacharias NA, Abd-Elseyed A. Use of Cryotherapy for Managing Chronic Pain: An Evidence-Based Narrative. *Pain Ther.* 2021;10(1):81-100. [doi:10.1007/s40122-020-00225-w](https://doi.org/10.1007/s40122-020-00225-w)

⁷⁵ Salas-Fraire O, Rivera-Pérez JA, Guevara-Neri NP, et al. Efficacy of whole-body cryotherapy in the treatment of chronic low back pain: Quasi-experimental study. *J Orthop Sci.* 2023;28(1):112-116. [doi:10.1016/j.jos.2021.10.006](https://doi.org/10.1016/j.jos.2021.10.006)

Acupuncture/Dry Needling



- It has been fairly well established that acupuncture treatments help with pain, which is why some insurance companies cover acupuncture (although you might need a referral from an MD).⁷⁶
- The exact mechanism isn't understood and the quality of research is a little rocky as, similar to exercise and muscle work, how do you have a proper placebo to compare with and who is going to pay for this research?^{77,78}
- Dry needling is one of the better ways of treating nasty muscle knots (myofascial trigger points, MFTPs).⁷⁹
- Needling may help with tendinosis. The research on it isn't great, but it does seem to help.⁸⁰

⁷⁶ Xiang A, Cheng K, Shen X, Xu P, Liu S. The Immediate Analgesic Effect of Acupuncture for Pain: A Systematic Review and Meta-Analysis. *Evid Based Complement Alternat Med*. 2017;2017:3837194. [doi:10.1155/2017/3837194](https://doi.org/10.1155/2017/3837194)

⁷⁷ Paley CA, Johnson MI. Acupuncture for the Relief of Chronic Pain: A Synthesis of Systematic Reviews. *Medicina (Kaunas)*. 2019;56(1):6. Published 2019 Dec 24. [doi:10.3390/medicina56010006](https://doi.org/10.3390/medicina56010006)

⁷⁸ Chys M, De Meulemeester K, De Greef I, et al. Clinical Effectiveness of Dry Needling in Patients with Musculoskeletal Pain-An Umbrella Review. *J Clin Med*. 2023;12(3):1205. Published 2023 Feb 2. [doi:10.3390/jcm12031205](https://doi.org/10.3390/jcm12031205)

⁷⁹ Navarro-Santana MJ, Sanchez-Infante J, Fernández-de-las-Peñas C, Cleland JA, Martín-Casas P, Plaza-Manzano G. Effectiveness of Dry Needling for Myofascial Trigger Points Associated with Neck Pain Symptoms: An Updated Systematic Review and Meta-Analysis. *Journal of Clinical Medicine*. 2020; 9(10):3300. <https://doi.org/10.3390/jcm9103300>

⁸⁰ Bostrøm, K., Mæhlum, S., Cvancarova Småstuen, M. et al. Clinical comparative effectiveness of acupuncture versus manual therapy treatment of lateral epicondylitis: feasibility randomized clinical trial. *Pilot Feasibility Stud* 5, 110 (2019). <https://doi.org/10.1186/s40814-019-0490-x>

Fenestration

-Both the more extreme version and the gentler acupuncture/dry needling version have reasonably good results.⁸¹

PRP, Prolotherapy (dextrose), and Stem Cells

-Then this is injected into the region with the pain/damage such as with a tendinosis.⁸²

-Those with arthritis pain may benefit from PRP injections in or around their joints (keep in mind that your pain might not be related to the arthritis). The injections in most studies seem to reduce pain, improve function, and it may reduce the rate of cartilage thinning.⁸³

-For many conditions like plantar fasciitis/fasciosis and TMJ pain, PRP seems to be superior to cortisone injections without the damage that cortisone can cause.^{84,85}

-A systematic review on prolotherapy for chronic pain concluded that prolotherapy was an effective treatment for tendinopathies (tendon issues), spine/pelvic ligament issues, and for knee/finger osteoarthritis.⁸⁶

-Mesenchymal stem cells are a popular option for nerve pain, particularly for neurodegenerative conditions, neuropathy from chemotherapy, brain damage from stroke, etc. as they can replace nerve cells and promote nerve growth.^{87,88}

⁸¹ Stoychev V, Finestone AS, Kalichman L. Dry Needling as a Treatment Modality for Tendinopathy: a Narrative Review. *Curr Rev Musculoskelet Med*. 2020;13(1):133-140. [doi:10.1007/s12178-020-09608-0](https://doi.org/10.1007/s12178-020-09608-0)

⁸² Miller LE, Parrish WR, Roides B, et al. Efficacy of platelet-rich plasma injections for symptomatic tendinopathy: systematic review and meta-analysis of randomised injection-controlled trials. *BMJ Open Sport & Exercise Medicine* 2017;3:e000237. [doi: 10.1136/bmjsem-2017-000237](https://doi.org/10.1136/bmjsem-2017-000237)

⁸³ Rodríguez-Merchán EC. Intra-Articular Platelet-Rich Plasma Injections in Knee Osteoarthritis: A Review of Their Current Molecular Mechanisms of Action and Their Degree of Efficacy. *Int J Mol Sci*. 2022;23(3):1301. Published 2022 Jan 24. doi:10.3390/ijms23031301

⁸⁴ Hohmann E, Tetsworth K, Glatt V. Platelet-Rich Plasma Versus Corticosteroids for the Treatment of Plantar Fasciitis: A Systematic Review and Meta-analysis. *Am J Sports Med*. 2021;49(5):1381-1393. [doi:10.1177/0363546520937293](https://doi.org/10.1177/0363546520937293)

⁸⁵ Gökçe Kutuk S, Gökçe G, Arslan M, Özkan Y, Kütük M, Kursat Arikan O. Clinical and Radiological Comparison of Effects of Platelet-Rich Plasma, Hyaluronic Acid, and Corticosteroid Injections on Temporomandibular Joint Osteoarthritis. *J Craniofac Surg*. 2019;30(4):1144-1148. [doi:10.1097/SCS.0000000000005211](https://doi.org/10.1097/SCS.0000000000005211)

⁸⁶ Hauser RA, Lackner JB, Steilen-Matias D, Harris DK. A Systematic Review of Dextrose Prolotherapy for Chronic Musculoskeletal Pain. *Clin Med Insights Arthritis Musculoskelet Disord*. 2016;9:139-159. Published 2016 Jul 7. [doi:10.4137/CMAMD.S39160](https://doi.org/10.4137/CMAMD.S39160)

⁸⁷ Ji XL, Ma L, Zhou WH, Xiong M. Narrative review of stem cell therapy for ischemic brain injury. *Transl Pediatr*. 2021;10(2):435-445. [doi:10.21037/tp-20-262](https://doi.org/10.21037/tp-20-262)

⁸⁸ Fortino VR, Pelaez D, Cheung HS. Concise review: stem cell therapies for neuropathic pain. *Stem Cells Transl Med*. 2013;2(5):394-399. [doi:10.5966/sctm.2012-0122](https://doi.org/10.5966/sctm.2012-0122)

Anesthetic/Nerve Blocks

- Anesthetic injections or nerve blocks can be useful for very short-term relief and to positively identify a pain generator.⁸⁹
- Although possibly not as bad as cortisone, anesthetics are toxic to cartilage cells so it should be used prudently if joints are involved.⁹⁰

Nerve Ablation

- The success rate in one study in the low back was 76% at 7–21 days after the denervation, 32% at 6 months, and 22% at 1 year.⁹¹

Cross-friction (Deep-friction Massage)

- Cross-friction can be the key to making progress on stubborn ligament and tendon pain.^{92,93}

⁸⁹ Atluri S, Datta S, Falco FJ, Lee M. Systematic review of diagnostic utility and therapeutic effectiveness of thoracic facet joint interventions. *Pain Physician*. 2008;11(5):[611-629](#).

⁹⁰ Gulihar A, Robati S, Twaij H, Salih A, Taylor GJ. Articular cartilage and local anaesthetic: A systematic review of the current literature. *J Orthop*. 2015;12(Suppl 2):S200-S210. Published 2015 Oct 31. [doi:10.1016/j.jor.2015.10.005](#)

⁹¹ Streitberger K, Müller T, Eichenberger U, Trelle S, Curatolo M. Factors determining the success of radiofrequency denervation in lumbar facet joint pain: a prospective study. *Eur Spine J*. 2011;20(12):2160-2165. [doi:10.1007/s00586-011-1891-6](#)

⁹² Joseph MF, Taft K, Moskwa M, Denegar CR. Deep Friction Massage to Treat Tendinopathy: A Systematic Review of a Classic Treatment in the Face of a New Paradigm of Understanding. *Journal of Sport Rehabilitation*. 2012;21(4):343-353. [doi:10.1123/jsr.21.4.343](#)

⁹³ Yi R, Bratchenko WW, Tan V. Deep Friction Massage Versus Steroid Injection in the Treatment of Lateral Epicondylitis. *Hand (N Y)*. 2018;13(1):56-59. [doi:10.1177/1558944717692088](#)

Instrument Assisted Soft Tissue Mobilization (Gua Sha, Graston, RockBlades, etc.)



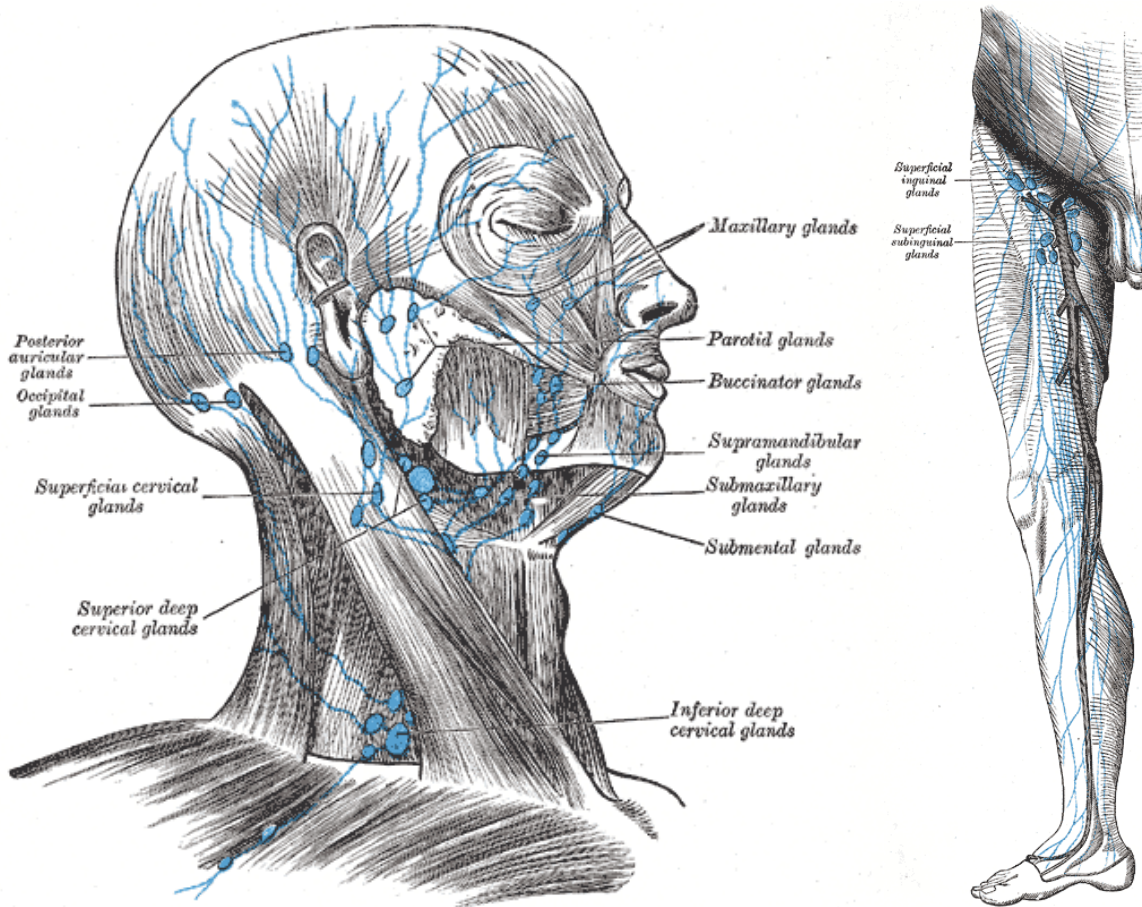
Cupping



-Cupping uses suction to lift the skin and is believed to have been done for thousands of years.⁹⁴

⁹⁴ Qureshi NA, Ali GI, Abushanab TS, et al. History of cupping (Hijama): a narrative review of literature. *J Integr Med.* 2017;15(3):172-181. [doi:10.1016/S2095-4964\(17\)60339-X](https://doi.org/10.1016/S2095-4964(17)60339-X)

Lymphatic Massage



Chiropractic Adjustments (joint manipulations/mobilizations)

-The benefit comes from the quickness of the movement which can result in a reflex relaxation of the nearby muscles.⁹⁵

-The quickness of a chiropractic adjustment seems to have a nervous system impact and may help people's pain via the central nervous system.⁹⁶

⁹⁵ Pickar JG, Bolton PS. Spinal manipulative therapy and somatosensory activation. *J Electromyogr Kinesiol.* 2012;22(5):785-794. [doi:10.1016/j.jelekin.2012.01.015](https://doi.org/10.1016/j.jelekin.2012.01.015)

⁹⁶ Pickar JG. Neurophysiological effects of spinal manipulation. *Spine J.* 2002;2(5):357-371. [doi:10.1016/s1529-9430\(02\)00400-x](https://doi.org/10.1016/s1529-9430(02)00400-x)

-I'd be more worried about taking ibuprofen than a chiropractic adjustment as chance of a more severe adverse event is about 3 in a million for a chiropractic adjustment,⁹⁷ but 100,000 people per year go to the emergency room and 10,000-20,000/year die from ibuprofen in the US.⁹⁸

-There are very severe cervical artery related strokes or dissections (tears of the artery) but those may have happened anyway or may have started before seeing the chiropractor as, statistically, people who visit chiropractors are not more likely to have these artery events.⁹⁹

-The symptoms of these events could be a headache with neck pain, which is a typical reason for people to seek out a chiropractor. Also, manipulations don't cause more stress on the artery than normal full neck rotations.¹⁰⁰

Activator



⁹⁷ Chu, E.CP., Trager, R.J., Lee, L.YK. et al. A retrospective analysis of the incidence of severe adverse events among recipients of chiropractic spinal manipulative therapy. *Sci Rep* 13, 1254 (2023).

<https://doi.org/10.1038/s41598-023-28520-4>

⁹⁸ Singh G. Recent considerations in nonsteroidal anti-inflammatory drug gastropathy. *Am J Med.* 1998;105(1B):31S-38S. [doi:10.1016/s0002-9343\(98\)00072-2](https://doi.org/10.1016/s0002-9343(98)00072-2)

⁹⁹ Whedon, J.M., Petersen, C.L., Li, Z. et al. Association between cervical artery dissection and spinal manipulative therapy –a medicare claims analysis. *BMC Geriatr* 22, 917 (2022).

<https://doi.org/10.1186/s12877-022-03495-5>

¹⁰⁰ Symons B, Herzog W. Cervical artery dissection: a biomechanical perspective. *J Can Chiropr Assoc.* 2013;57(4):276-278.

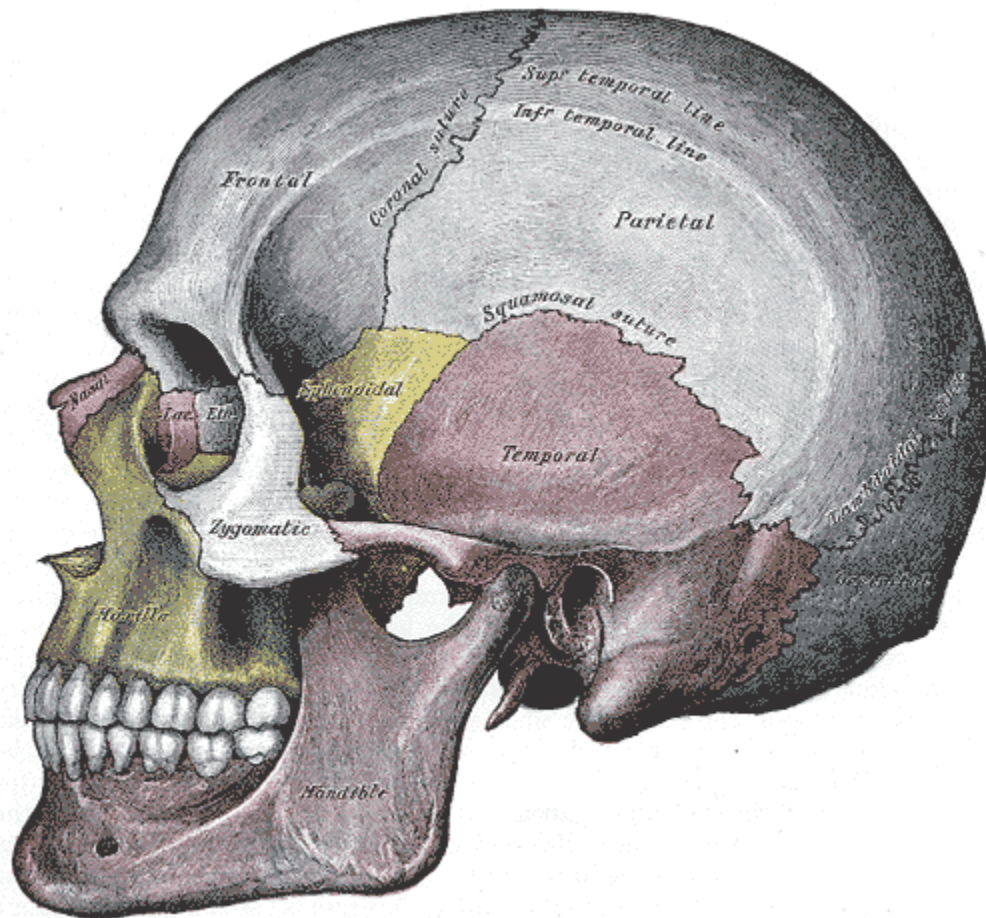
Massage Therapy / Muscle Massagers (percussion massagers)



-The skin contact and tissue manipulation can help with central sensitization/fibromyalgia, by helping the nervous system to relax.¹⁰¹

¹⁰¹ Li Y-h, Wang F-y, Feng C-q, Yang X-f, Sun Y-h (2014) Massage Therapy for Fibromyalgia: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. PLoS ONE 9(2): e89304. <https://doi.org/10.1371/journal.pone.0089304>

Cranial Techniques



- Some of the claimed benefits involving improved cognition and memory are attributed to increased cerebral spinal fluid flow from increased cranial bone mobility.¹⁰²
- Cerebral spinal fluid flow is still an active area of research, but none of the theories being investigated by the medical community involve cranial bones.¹⁰³
- These are not mobile joints, and chiropractors/osteopaths advertising moving these bones are mocked in the medical community.¹⁰⁴
- The skull is wrapped in layers of fascia and tissue which I think is the mechanism why these techniques can be effective. In fact, these layers have been linked to stubborn post-concussion headaches.¹⁰⁵

¹⁰² <https://www.cranialtherapycentre.com/a-beginners-guide-to-craniosacral-therapy/>

¹⁰³ Wichmann TO, Damkier HH and Pedersen M (2022) A Brief Overview of the Cerebrospinal Fluid System and Its Implications for Brain and Spinal Cord Diseases. *Front. Hum. Neurosci.* 15:737217. doi: 10.3389/fnhum.2021.737217

¹⁰⁴ Hartman SE. Cranial osteopathy: its fate seems clear. *Chiropr Osteopat.* 2006;14:10. Published 2006 Jun 8. doi:10.1186/1746-1340-14-10

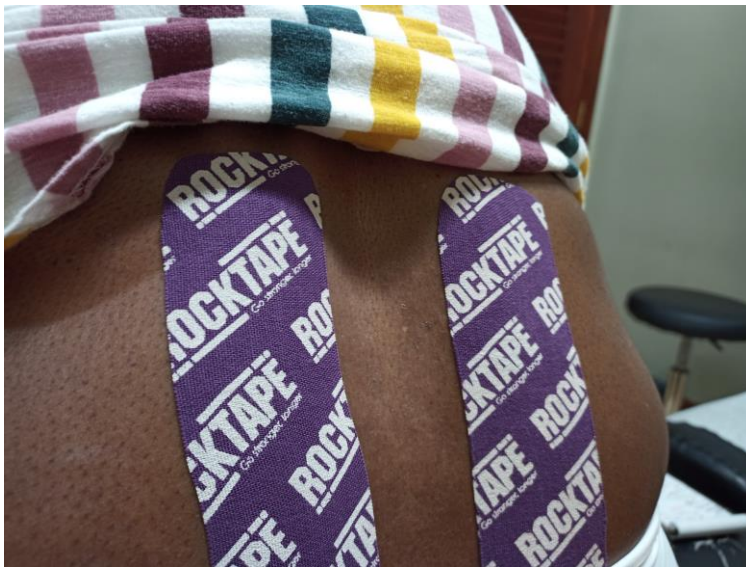
¹⁰⁵ Defrin R. Chronic post-traumatic headache: clinical findings and possible mechanisms. *J Man Manip Ther.* 2014;22(1):36-44. doi:10.1179/2042618613Y.0000000053

Nasal Specific



- Some claim this is an all-natural facelift and it shifts the bones of the skull.¹⁰⁶
- Some claim it makes you better at math and improves your memory, as they allege that a more mobile sphenoid improves cerebral spinal fluid flow.¹⁰⁷

Kinesio Tape



- When you add that many studies have found no benefit with using the Kinesio tape, some conclude that there is insufficient evidence to recommend it.¹⁰⁸

¹⁰⁶ <https://www.lsfo.co.uk/about/neurocranial-restructuring/>

¹⁰⁷ <https://www.yourhealthinmotion.com/nasal-specific-technique/>

¹⁰⁸ Parreira Pdo C, Costa Lda C, Hespanhol LC Jr, Lopes AD, Costa LO. Current evidence does not support the use of Kinesio Taping in clinical practice: a systematic review. *J Physiother.* 2014;60(1):31-39. [doi:10.1016/j.jphys.2013.12.008](https://doi.org/10.1016/j.jphys.2013.12.008)

Vibration Plate (Whole-Body-Vibration, WBV)

- I see other claims online of 10 minutes = 1 hour of cardio.¹⁰⁹
- While the outrageous claims are false, there are some benefits to vibration plates, in particular for those with a chronic pain syndrome.¹¹⁰
- I typically have my patients stand normally on the vibration plate which is sufficient for whole body vibrations for a vertical vibration unit, but squatting with knees on elbows can transfer vibrations to the upper body for one of the alternating units.¹¹¹

Traction and Inversion Tables

- About 75% of physiotherapists in the states use it, but in systematic reviews, they have not found any strong evidence supporting its use.^{112,113}

Hyperbaric Oxygen Therapy

- It seems to have an analgesic effect.¹¹⁴
- In one systematic review/meta-analysis of fibromyalgia patients (central sensitization), HBOT seemed to decrease their pain, but 24% had adverse reactions.¹¹⁵
- One study looked at the effects on the brain and found that those who reported reduced pain had some changes in the regions of the brain related to fibromyalgia/central sensitization.¹¹⁶

¹⁰⁹ <https://www.radianceintl.com/pages/faq-whole-body-vibration>

¹¹⁰ Wang, W., Wang, S., Lin, W. et al. Efficacy of whole body vibration therapy on pain and functional ability in people with non-specific low back pain: a systematic review. *BMC Complement Med Ther* 20, 158 (2020). <https://doi.org/10.1186/s12906-020-02948-x>

¹¹¹ Tsukahara Y, Iwamoto J, Iwashita K, Shinjo T, Azuma K, Matsumoto H. What is the most effective posture to conduct vibration from the lower to the upper extremities during whole-body vibration exercise?. *Open Access J Sports Med*. 2016;7:5-10. Published 2016 Jan 6. [doi:10.2147/OAJSM.S93047](https://doi.org/10.2147/OAJSM.S93047)

¹¹² Vanti C, Panizzolo A, Turone L, et al. Effectiveness of Mechanical Traction for Lumbar Radiculopathy: A Systematic Review and Meta-Analysis. *Phys Ther*. 2021;101(3):pzaa231. [doi:10.1093/ptj/pzaa231](https://doi.org/10.1093/ptj/pzaa231)

¹¹³ Alrwaily, M., Almutiri, M. & Schneider, M. Assessment of variability in traction interventions for patients with low back pain: a systematic review. *Chiropr Man Therap* 26, 35 (2018). <https://doi.org/10.1186/s12998-018-0205-z>

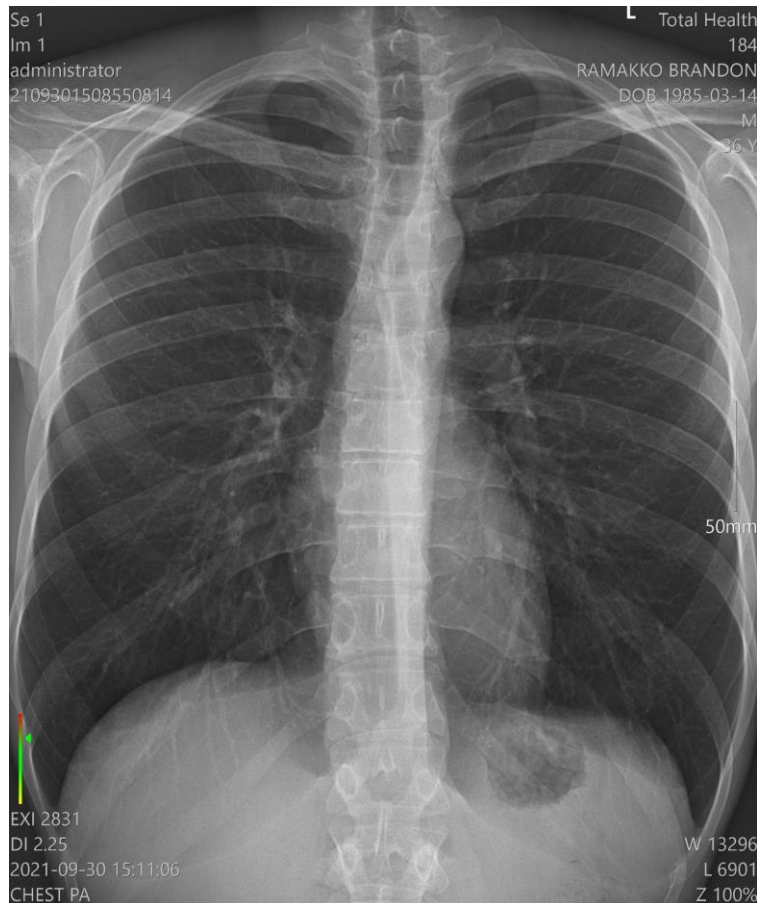
¹¹⁴ Schiavo S, DeBacker J, Djaiani C, Bhatia A, Englesakis M, Katznelson R. Mechanistic Rationale and Clinical Efficacy of Hyperbaric Oxygen Therapy in Chronic Neuropathic Pain: An Evidence-Based Narrative Review. *Pain Res Manag*. 2021;2021:8817504. [doi:10.1155/2021/8817504](https://doi.org/10.1155/2021/8817504)

¹¹⁵ Chen X, You J, Ma H, et al. Efficacy and safety of hyperbaric oxygen therapy for fibromyalgia: a systematic review and meta-analysis, *BMJ Open* 2023;13:e062322. [doi: 10.1136/bmjopen-2022-062322](https://doi.org/10.1136/bmjopen-2022-062322)

¹¹⁶ Pejic W, Frey N. Hyperbaric Oxygen Therapy for the Treatment of Chronic Pain: A Review of Clinical Effectiveness and Cost-Effectiveness [Internet]. *Ottawa (ON): Canadian Agency for Drugs and Technologies in Health*; 2018 Sep 17. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK537956/>

Common Types of Medical Imaging

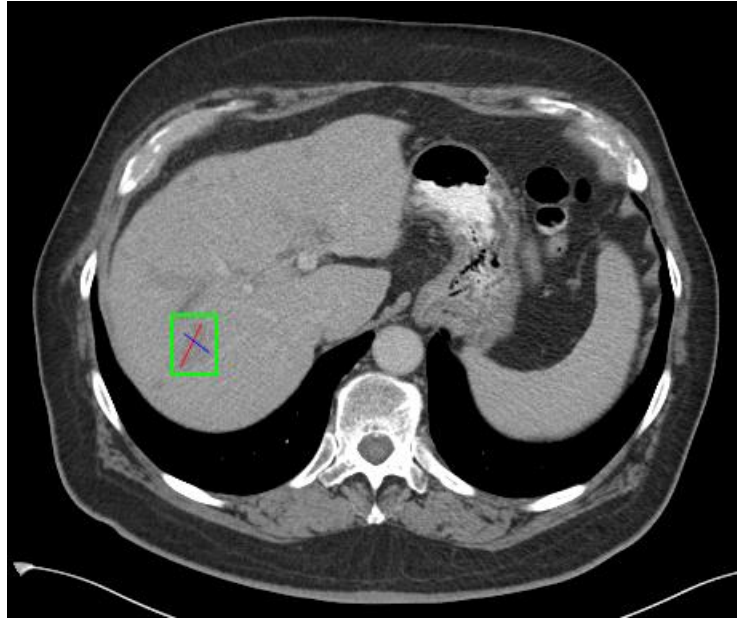
Radiographs (X-rays)



-Sleeping next to someone (people are radioactive!) for a year gives you the similar radiation dose as a shoulder X-ray, which is a similar extra radiation dose you get via cosmic radiation from flying in an airplane for a couple hours.¹¹⁷

¹¹⁷ Wikipedia contributors. Flight-time equivalent dose. Wikipedia, The Free Encyclopedia. August 15, 2023, 01:44 UTC. Accessed October 11, 2023. Available at: https://en.wikipedia.org/w/index.php?title=Flight-time_equivalent_dose&oldid=1170438553.

Computed Tomography (CT or CAT scans)



118

Magnetic Resonance Imaging (MRI)

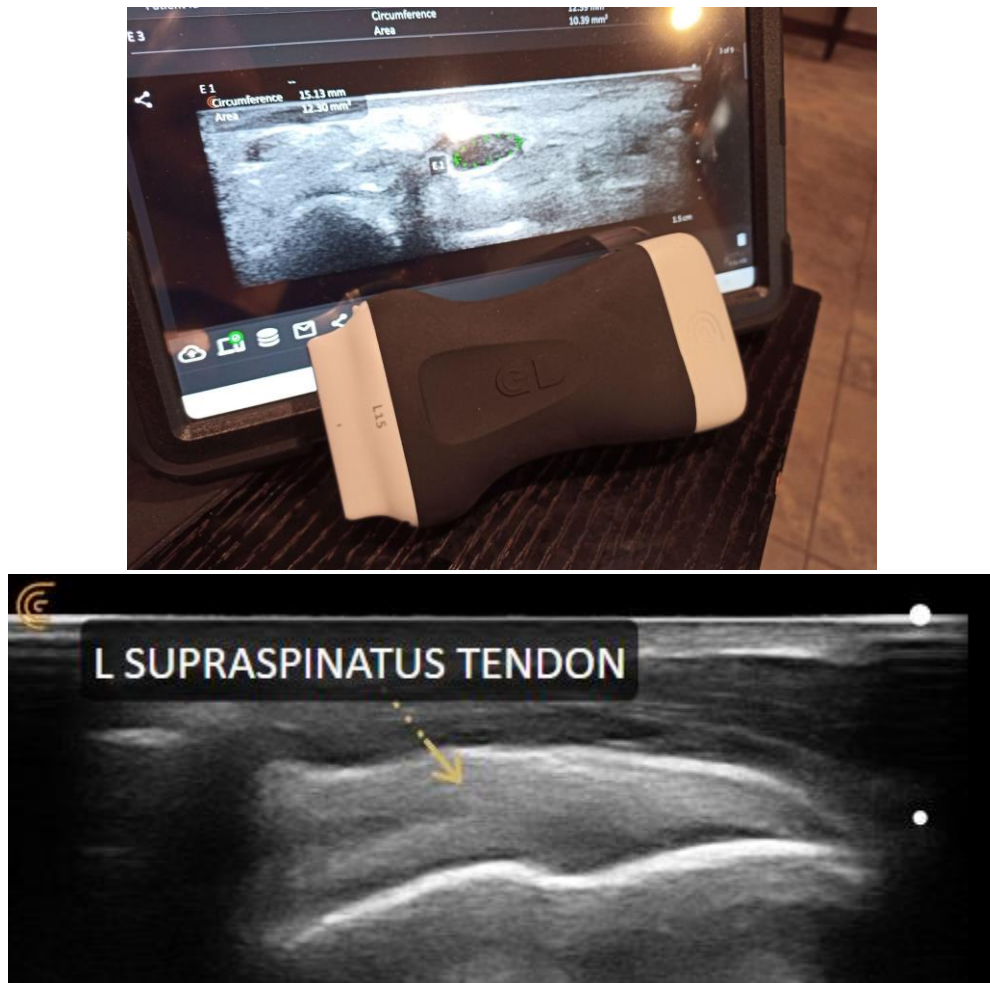


-When the molecules return to their original state, they give off a signal that the machine can interpret.¹¹⁹

¹¹⁸ Ke Yan, Xiaosong Wang, Le Lu, Ronald M. Summers, "DeepLesion: Automated Mining of Large-Scale Lesion Annotations and Universal Lesion Detection with Deep Learning", *Journal of Medical Imaging* 5(3), 036501 (2018), doi: 10.1117/1.JMI.5.3.036501

¹¹⁹ This two sentence explanation is borderline misleading due to the details left out. Even for a physicist, the exact way it works for the different types of MRI images T1, T2, STIR, functional MRI, etc. can get a

Ultrasound Imaging (Sonography)



Dual-energy X-ray Absorptiometry (DEXA) Scan

-Osteoporosis is typically diagnosed when the t-score is less than -2.5.¹²⁰

Common Medications

-Some specific drug information is taken from [Drugs.com](https://www.drugs.com) which is a good resource for any drug.

Ibuprofen (Advil, Motrin, Nurofen, etc.)

-“NSAIDs are not recommended for long-term use, and a careful surveillance to monitor for toxicity and efficacy is critical. Each year in the USA, the side-effects of long-term NSAID use

little complicated. Some more information: Berger A. Magnetic resonance imaging. *BMJ*. 2002;324(7328):35. doi:10.1136/bmj.324.7328.35

¹²⁰ <https://www.bonehealthandosteoporosis.org/patients/diagnosis-information/bone-density-examtesting/>

cause nearly 103,000 hospitalizations and 16,500 deaths. This figure is similar to the annual number of deaths from AIDS and considerably greater than the number of deaths from asthma and cervical cancer.”¹²¹

Gabapentin

-A recent study found that those who visited a chiropractor for back pain were about 50% less likely to receive an off-label gabapentin prescription.¹²²

Antidepressants/SSRIs (Lexapro, Zoloft, Prozac, Paxil, Sarafem, etc.)

-SSRIs are not more effective than placebo for the majority of patients.¹²³

-They are only more effective in the most severe cases of depression, and even then, it was statistically significant, but not clinically significant.¹²⁴

-Mental health therapy¹²⁵ or exercise¹²⁶ both work as well as antidepressants. St. John's Wort (botanical remedy) works as well as antidepressants for major depressive disorders, and with fewer side effects.¹²⁷

Statins (Lipitor, Altoprev, pravastatin, Crestor, etc.)

-Lifestyle modifications (diet and increased activity) are superior to statins and come with other beneficial effects.¹²⁸

¹²¹ Ussai S, Miceli L, Pisa FE, et al. Impact of potential inappropriate NSAIDs use in chronic pain. *Drug Des Devel Ther.* 2015; 9:2073-2077. [doi:10.2147/DDDT.S80686](https://doi.org/10.2147/DDDT.S80686)

¹²² Trager RJ, Cupler ZA, Srinivasan R, Casselberry RM, Perez JA, Dusek JA. Association between chiropractic spinal manipulation and gabapentin prescription in adults with radicular low back pain: retrospective cohort study using US data. *BMJ Open.* 2023;13(7):e073258. Published 2023 Jul 21. [doi:10.1136/bmjopen-2023-073258](https://doi.org/10.1136/bmjopen-2023-073258)

¹²³ Mayur S. Meta-analysis shows difference between antidepressants and placebo is only significant in severe depression. *BMJ.* 2008;336(7642):466. [doi:10.1136/bmj.39503.656852.DB](https://doi.org/10.1136/bmj.39503.656852.DB)

¹²⁴ Jakobsen J, et al. . Selective serotonin reuptake inhibitors versus placebo in patients with major depressive disorder. A systematic review with meta-analysis and Trial Sequential Analysis. *BMC Psychiatry.* 17. (2017) [10.1186/s12888-016-1173-2](https://doi.org/10.1186/s12888-016-1173-2).

¹²⁵ Cuijpers, P., Noma, H., Karyotaki, E., Vinkers, C.H., Cipriani, and Furukawa, T.A. A network meta-analysis of the effects of psychotherapies, pharmacotherapies and their combination in the treatment of adult depression. *World Psychiatry.* (2020) 19: 92-107. <https://doi.org/10.1002/wps.20701>

¹²⁶ Recchia F, Leung CK, Chin EC, et al. Comparative effectiveness of exercise, antidepressants and their combination in treating non-severe depression: a systematic review and network meta-analysis of randomized controlled trials. *British Journal of Sports Medicine* 2022; [56:1375-1380](https://doi.org/10.1136/bjsports-2022-101375).

¹²⁷ Apaydin, E.A., Maher, A.R., Shanman, R. et al. A systematic review of St. John's wort for major depressive disorder. *Syst Rev* 5, 148 (2016). <https://doi.org/10.1186/s13643-016-0325-2>

¹²⁸ Becker DJ, French B, Morris PB, Silvent E, Gordon RY. Phytosterols, red yeast rice, and lifestyle changes instead of statins: a randomized, double-blinded, placebo-controlled trial. *Am Heart J.* 2013;166(1):187-196. [doi:10.1016/j.ahj.2013.03.019](https://doi.org/10.1016/j.ahj.2013.03.019)

Common Botanicals and Natural Remedies

-Unless otherwise noted, information is taken from [Healthnotes](#).

Glucosamine/Chondroitin Sulphate

-In most studies (not all) they improved pain and function in those diagnosed with osteoarthritis.¹²⁹

Curcumin (turmeric)

-Curcumin has similar benefits to pain and function without the troublesome, and sometimes lethal, gastrointestinal side effects of NSAIDs.¹³⁰

Cranberry Extract

-From preliminary studies and personal anecdotes from women I've recommended this to, it can prevent chronic UTIs taken regularly or in temporal proximity to intercourse.¹³¹

-It might help with active UTIs.¹³²

Garlic

-In one study, using 12 weeks of supplementation, they found that one third had significant reduction in blood pressure with an average drop of 11.2mmHg systolic and 6.4mmHg diastolic in the subgroup.¹³³

-For comparison, decreasing salt intake reduces blood pressure by an average of 3.4 mmHg systolic and 1.5 mmHg diastolic.¹³⁴

¹²⁹ Jerosch J. Effects of Glucosamine and Chondroitin Sulfate on Cartilage Metabolism in OA: Outlook on Other Nutrient Partners Especially Omega-3 Fatty Acids. *Int J Rheumatol*. 2011;2011:969012. [doi:10.1155/2011/969012](https://doi.org/10.1155/2011/969012)

¹³⁰ Paultre K, Cade W, Hernandez D, *et al*. Therapeutic effects of turmeric or curcumin extract on pain and function for individuals with knee osteoarthritis: a systematic review. *BMJ Open Sport & Exercise Medicine* 2021;7:e000935. [doi: 10.1136/bmjsem-2020-000935](https://doi.org/10.1136/bmjsem-2020-000935)

¹³¹ Babar A, Moore L, Leblanc V, *et al*. High dose versus low dose standardized cranberry proanthocyanidin extract for the prevention of recurrent urinary tract infection in healthy women: a double-blind randomized controlled trial. *BMC Urol*. 2021;21(1):44. Published 2021 Mar 23. [doi:10.1186/s12894-021-00811-w](https://doi.org/10.1186/s12894-021-00811-w)

¹³² Gbinigie OA, Spencer EA, Heneghan CJ, Lee JJ, Butler CC. Cranberry Extract for Symptoms of Acute, Uncomplicated Urinary Tract Infection: A Systematic Review. *Antibiotics (Basel)*. 2020;10(1):12. Published 2020 Dec 25. [doi:10.3390/antibiotics10010012](https://doi.org/10.3390/antibiotics10010012)

¹³³ Ried K, Travica N, Sali A. The effect of aged garlic extract on blood pressure and other cardiovascular risk factors in uncontrolled hypertensives: the AGE at Heart trial. *Integr Blood Press Control* 2016;9:9–21. [doi:10.2147/IBPC.S93335](https://doi.org/10.2147/IBPC.S93335)

¹³⁴ Aburto NJ, Ziolkovska A, Hooper L, Elliott P, Cappuccio FP, Meerpohl JJ. Effect of lower sodium intake on health: systematic review and meta-analyses. *BMJ*. 2013;346:f1326. Published 2013 Apr 3. [doi:10.1136/bmj.f1326](https://doi.org/10.1136/bmj.f1326)

Common Nutritional Supplements

-Unless otherwise stated, information comes from [Healthnotes](#).

Omega-3

- Total values around 1.1-1.6g/daily seems to be normal/adequate, but there isn't a recommended daily value and no recommended minimum for the DHA/EPA component.¹³⁵
- Good dietary sources of DHA/EPA are: seafood, flax seeds, chia seeds, and walnuts.¹³⁶

Boron

-There is a growing amount of evidence suggesting our diets are deficient in boron which is why supplementing with boron seems to have such beneficial effects: in particular for arthritis and reduced male libido.¹³⁷

-A fairly recent systematic review in 2019 concluded the following:

"Boron has a positive effect on the growth of bone and central nervous system, hormone regulation, reducing the risk of some types of cancer, improvement of arthritis and associated heart disease symptoms, speeding up the wound healing, pain reduction in gynecological diseases, and kidney stones. Despite the need for boron intake of 1-3 mg per day in adults, symptoms of boron deficiency such as arthritis, amnesia, osteoporosis, degenerative and soft cartilage diseases, hormonal disorders, and decreased libido are still common, and this deficiency can have many adverse effects that can be prevented. Therefore, its consumption as a reasonable dietary and a suitable alternative for common chemical drugs is recommended."¹³⁸

-Good dietary sources of boron are: prune juice, avocado, raisins, peaches, apples, pears, peanuts, beans, and grapes.¹³⁹

Vitamin D

-It seems to be necessary for proper immune-system functioning because those deficient in vitamin D end up getting more colds, more eczema, more autoimmune conditions like MS, etc.¹⁴⁰

-Good dietary sources of vitamin D are: cod liver oil, salmon, tuna, beef liver, eggs, and fortified food (drinks and cereals).¹⁴¹

¹³⁵ <https://ods.od.nih.gov/factsheets/Omega3FattyAcids-HealthProfessional/>

¹³⁶ <https://www.healthline.com/nutrition/12-omega-3-rich-foods>

¹³⁷ Pizzorno L. Nothing Boring About Boron. *Integr Med (Encinitas)*. 2015;14(4):35-48.

¹³⁸ Nikkhah S, Naghii M R. Medicinal Properties of Boron Supplementation on the Prevention and Treatment of Diseases: A Systematic Review. *cmja* 2019; 9 (3) :3760-3779

¹³⁹ <https://ods.od.nih.gov/factsheets/Boron-HealthProfessional/>

¹⁴⁰ Sintzel MB, Rametta M, Reder AT. Vitamin D and Multiple Sclerosis: A Comprehensive Review. *Neurol Ther*. 2018;7(1):59-85. doi:10.1007/s40120-017-0086-4

¹⁴¹ <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/> ,
<https://www.hsph.harvard.edu/nutritionsource/vitamin-d/>

Magnesium

-Magnesium is one of the minerals that cheap multivitamins often use an inferior version of. Magnesium oxide isn't absorbed easily but magnesium citrate, chloride, malate, lactate, L-threonate, taurate, orotate, or glycinate are all absorbed well.¹⁴²

-Good dietary sources of magnesium are: pumpkin seeds, chia seeds, almonds, cashews, peanuts, kidney/black beans, spinach, potatoes w/skin, and brown rice.¹⁴³

B12/Folate

-Good dietary sources of B12 vitamins are all animal products, so vegans/vegetarians are normally deficient unless they supplement or consume cereals/milks/drinks fortified with B12.¹⁴⁴

Iron

-Good dietary sources of iron are: red meat, beans, nuts, dried fruit, and liver.¹⁴⁵

Zinc

-Good dietary sources of zinc are: seafood (oysters in particular), meat, legumes, milk products, and pumpkin seeds.¹⁴⁶

Decent Sources of information

Website	Description
DrRamakko.com	This is my personal website. I have some videos and articles there. You can also book virtual sessions with me so I can answer your questions or to receive health coaching.
triggerpoints.net	You can look up where nasty muscle knots might be hiding. The website contains common muscle knot locations and their referred pain pattern. You can search by muscle or by where the pain is.
Drugs.com	A useful resource for any drugs you may be taking. Has dosage and common side effects. Has information on signs for when to call your doctor or go to emergency. Good to read through for every drug you take.

¹⁴² <https://www.healthline.com/nutrition/magnesium-types>

¹⁴³ <https://ods.od.nih.gov/factsheets/Magnesium-HealthProfessional/>

¹⁴⁴ <https://ods.od.nih.gov/factsheets/VitaminB12-HealthProfessional/> ,
<https://www.healthline.com/nutrition/vitamin-b12-foods>

¹⁴⁵ <https://www.nhs.uk/conditions/vitamins-and-minerals/iron/>

¹⁴⁶ <https://ods.od.nih.gov/factsheets/Zinc-HealthProfessional/>

Healthnotes	A useful resource for supplement and botanical information. There is a star rating system based on how strong the evidence is. Has information on the mechanism, evidence, dosage, interactions, and side effects. https://www.nutriadvanced.co.uk/healthnotes/
Mayo clinic, Cleveland clinic, etc.	Some hospitals or clinics create resources and handouts for patients. The Mayo Clinic and Cleveland Clinic both have reasonably good basic level information on their respective websites. If I Google a diagnosis and one of their sites comes up, I often email that link to a patient.
NHS	The NHS is the UK health system and the individual hospitals create handouts for patients. I Google: “(name of health condition) NHS handout” and I normally have a selection of handouts appropriate to provide to patients with home care advice and/or exercises.
Bob & Brad	There is lots of great stuff on YouTube, and I chose this channel as an example. This channel is a couple of physiotherapists sharing exercises and stretches that have helped their patients. Notice their use of language, “I find this helps some of my patients” or “Sometimes I have my patient do this,” etc. Not every exercise is perfect for everyone or for every condition.
Physiopedia	This is a resource for physiotherapists but anyone can Google “condition+physiopedia” to find their article on how to diagnose and treat the condition. I find myself using it semi-regularly.
UWS CSPE Protocols and Care Pathways	These are the University of Western States' clinical standards, protocols, and educational resources. These are detailed documents based on the best evidence available. They describe how to diagnose and treat various conditions. Similar to Physiopedia in that it is written for health professionals. https://www.uws.edu/cspe-protocols-care-pathways/
Harvard's Nutrition Source	This is a research based nutritional resource written for the general public.
National Institutes of Health Office of Dietary Supplements	This is a research based nutritional resource for both the general public and for health professionals.

Headaches

-There are over 200 types/variations of headaches as categorized by the International Headache Society, and these headaches have overlapping symptoms and the presentations can vary between patients.¹⁴⁷

Migraines

-There are some features that are unique to migraines, some that aren't consistent with all migraines, and some that appear for all migraines but are common in other headaches too.¹⁴⁸

-CoQ10 in most migraine sufferers reduces frequency of headaches by over 50% and seems to reduce intensity and duration as well.^{149,150}

-The effects of omega-3 supplementation seems to be less consistent (probably depends on whether the sample population is deficient or not) but there are signs it helps with headache duration and perhaps intensity and frequency.^{151,152}

Tension-type Headaches

¹⁴⁷ Headache Classification Committee of the International Headache Society (IHS) The International Classification of Headache Disorders, 3rd edition. *Cephalalgia*. 2018;38(1):1-211. [doi:10.1177/0333102417738202](https://doi.org/10.1177/0333102417738202)

¹⁴⁸ <https://americanmigrainefoundation.org/>

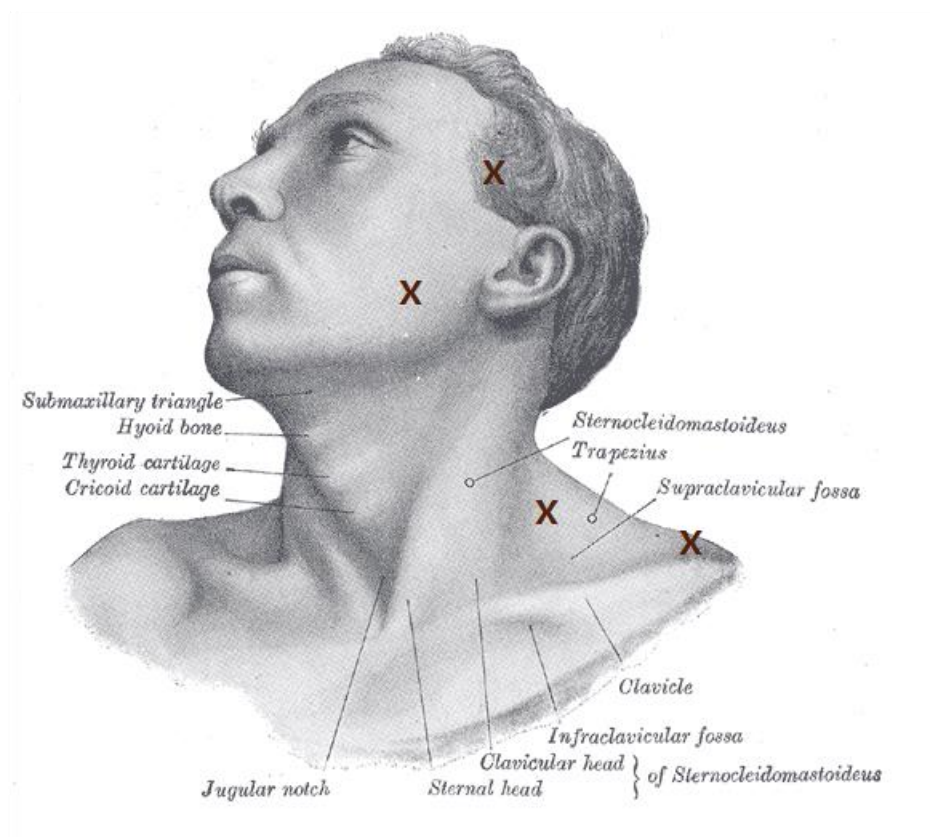
¹⁴⁹ Shoeibi A, Olfati N, Soltani Sabi M, Salehi M, Mali S, Akbari Oryani M. Effectiveness of coenzyme Q10 in prophylactic treatment of migraine headache: an open-label, add-on, controlled trial. *Acta Neurol Belg*. 2017;117(1):103-109. [doi:10.1007/s13760-016-0697-z](https://doi.org/10.1007/s13760-016-0697-z)

¹⁵⁰ Sazali S, Badrin S, Norhayati MN, Idris NS. Coenzyme Q10 supplementation for prophylaxis in adult patients with migraine-a meta-analysis. *BMJ Open*. 2021;11(1):e039358. Published 2021 Jan 5. [doi:10.1136/bmjopen-2020-039358](https://doi.org/10.1136/bmjopen-2020-039358)

¹⁵¹ Maghsoumi-Norouzabad L, Mansoori A, Abed R, Shishehbor F. Effects of omega-3 fatty acids on the frequency, severity, and duration of migraine attacks: A systematic review and meta-analysis of randomized controlled trials. *Nutr Neurosci*. 2018;21(9):614-623. [doi:10.1080/1028415X.2017.1344371](https://doi.org/10.1080/1028415X.2017.1344371)

¹⁵² Ramsden C E, Zamora D, Faurot K R, MacIntosh B, Horowitz M, Keyes G S et al. Dietary alteration of n-3 and n-6 fatty acids for headache reduction in adults with migraine: randomized controlled trial *BMJ* 2021; 374 :n1448 [doi:10.1136/bmj.n1448](https://doi.org/10.1136/bmj.n1448)

Common Headache Muscle Knots 1



Common Headache Muscle Knots 2



Chronic Post-Concussion Headaches

-Post-concussion symptoms occur after a traumatic brain injury (TBI).¹⁵³

¹⁵³ Permenter CM, Fernández-de Thomas RJ, Sherman AI. Postconcussive Syndrome. [Updated 2022 Aug 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK534786/>

Sinus Headaches

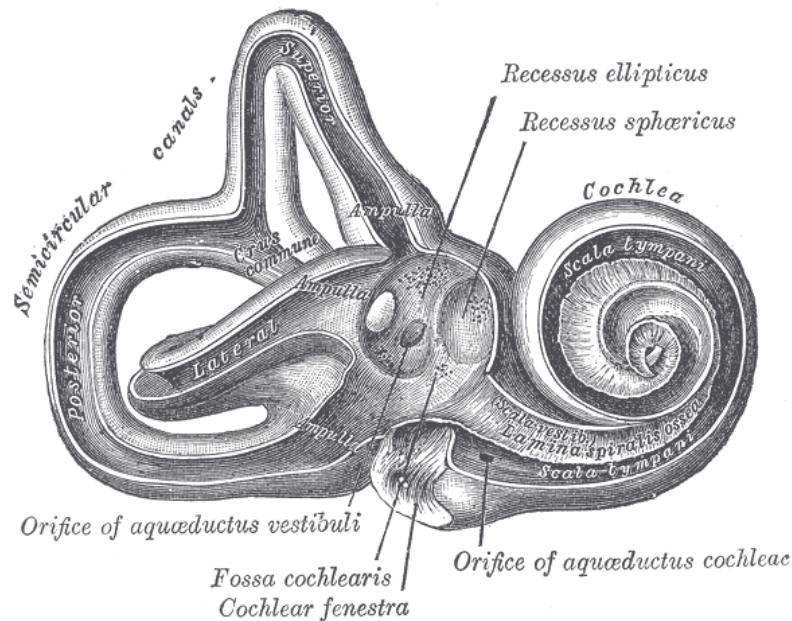


Tinnitus

-Some types of tinnitus vary in intensity with neck motion, and if the neck is treated/rehabbed, the tinnitus can be reduced in intensity.¹⁵⁴

Dizziness

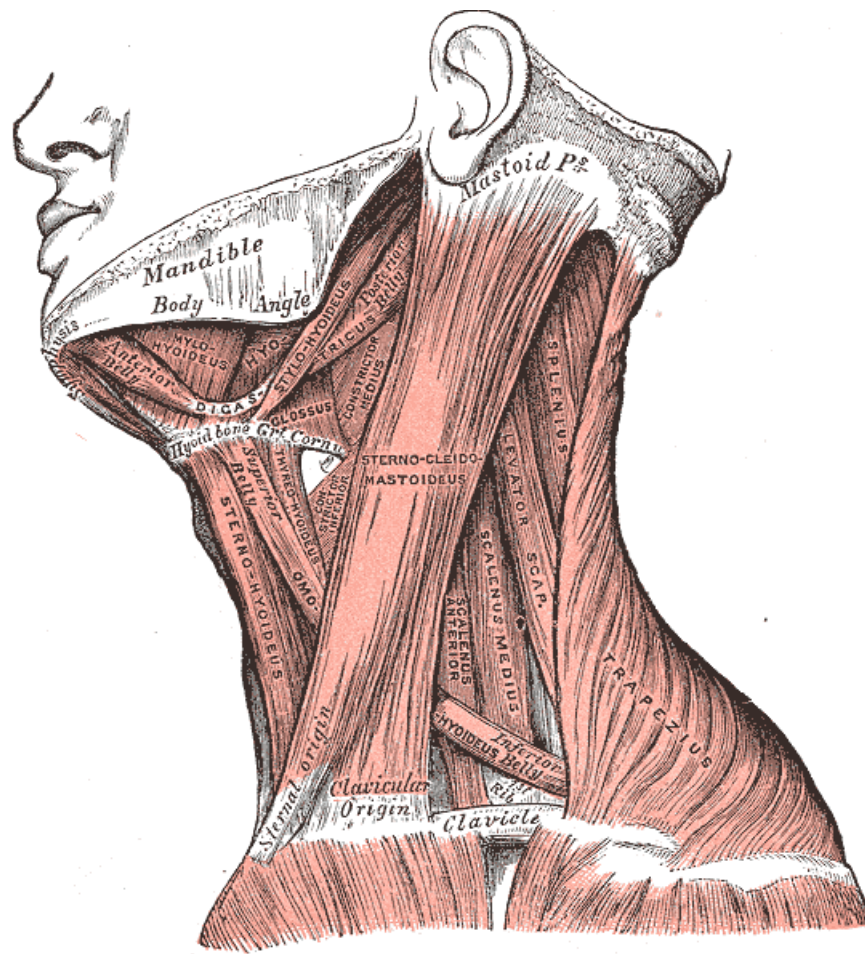
-It can happen to anyone, but the risk factors for this condition are: being a woman, vitamin D deficiency, osteoporosis, migraines, head trauma, and high total cholesterol.¹⁵⁵

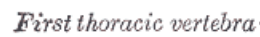
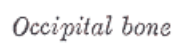


¹⁵⁴ Sanchez TG, Rocha CB. Diagnosis and management of somatosensory tinnitus: review article. *Clinics* (Sao Paulo). 2011;66(6):1089-1094. [doi:10.1590/s1807-59322011000600028](https://doi.org/10.1590/s1807-59322011000600028)

¹⁵⁵ Chen J, Zhao W, Yue X, Zhang P. Risk Factors for the Occurrence of Benign Paroxysmal Positional Vertigo: A Systematic Review and Meta-Analysis. *Front Neurol*. 2020;11:506. Published 2020 Jun 23. [doi:10.3389/fneur.2020.00506](https://doi.org/10.3389/fneur.2020.00506)

Neck





First rib

-Second rib

~~Third rib~~

-If I have them set up with their head unsupported but with their head back and chin tucked, then the large muscles can't help, and the small muscles will be tested (Jull's test). A healthy and strong neck should be able to reach approximately 60 seconds. Averages are normally around 30 seconds.¹⁵⁶

There is a useful at-home segmental stretch of the cervical (neck) segments of the spine called sustained natural apophyseal glides (SNAGs).

- You basically use the edge of a hand towel to add a little overpressure at a particular segment in the neck as you either rotate the neck or look upwards.
- Afterwards, the towel can be moved upwards and/or downwards to target other individual segments.

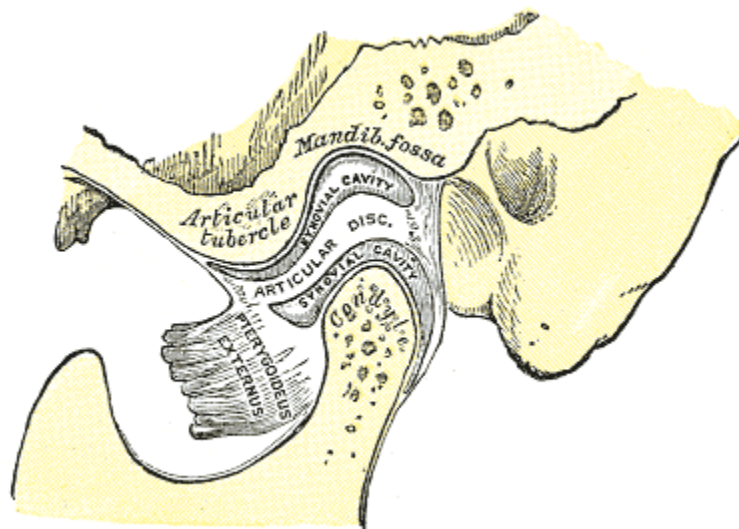
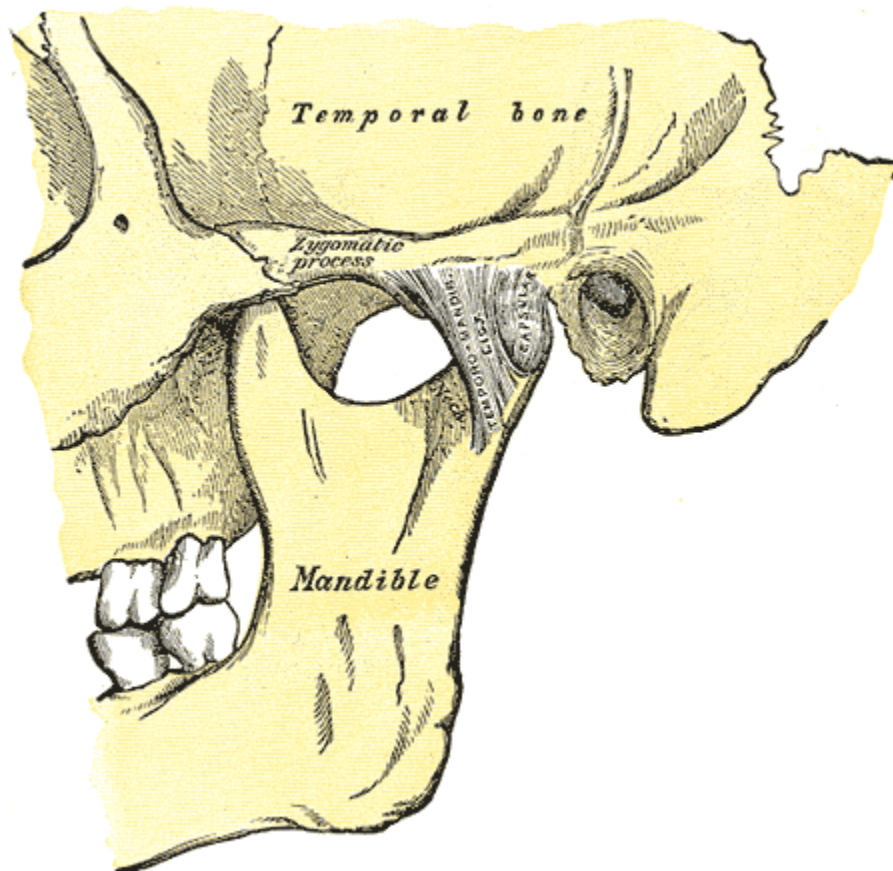
A pin-and-stretch of the anterior scalenes might also help. Keep in mind, the relief from stretching won't stick unless you do the exercises!

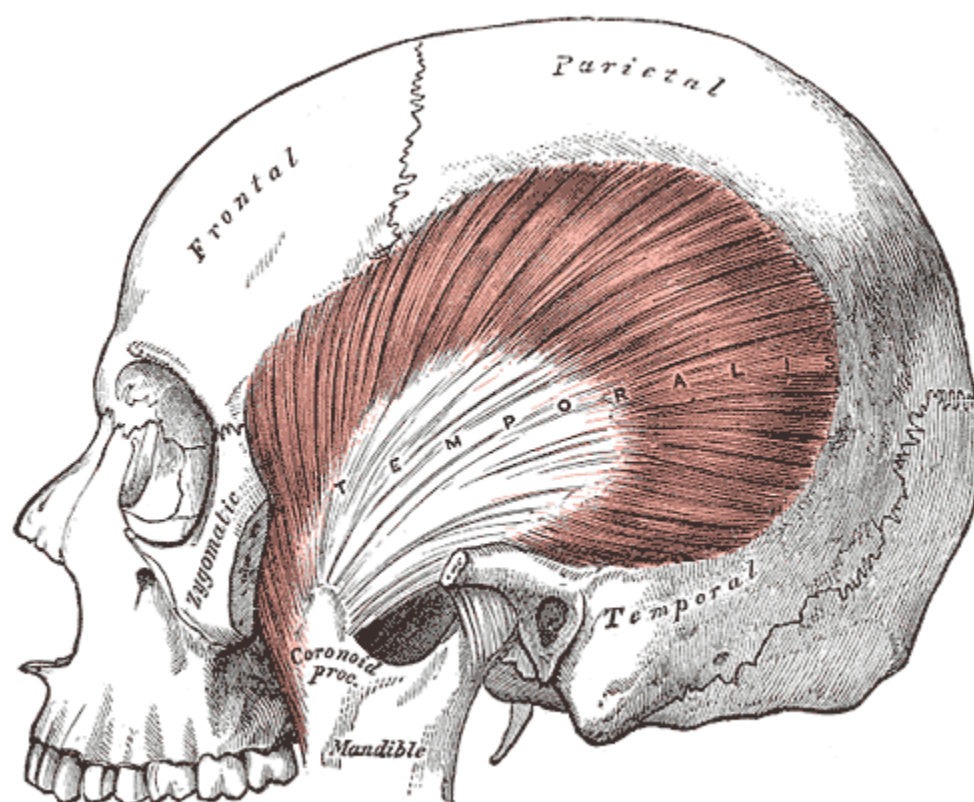
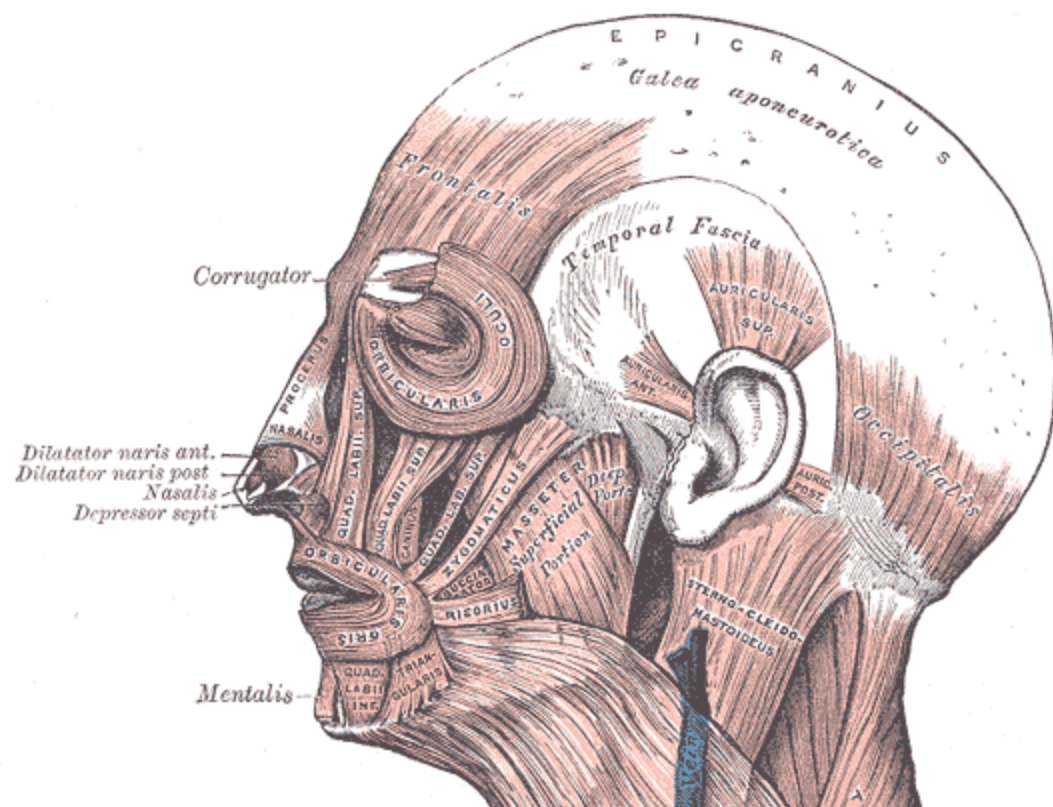


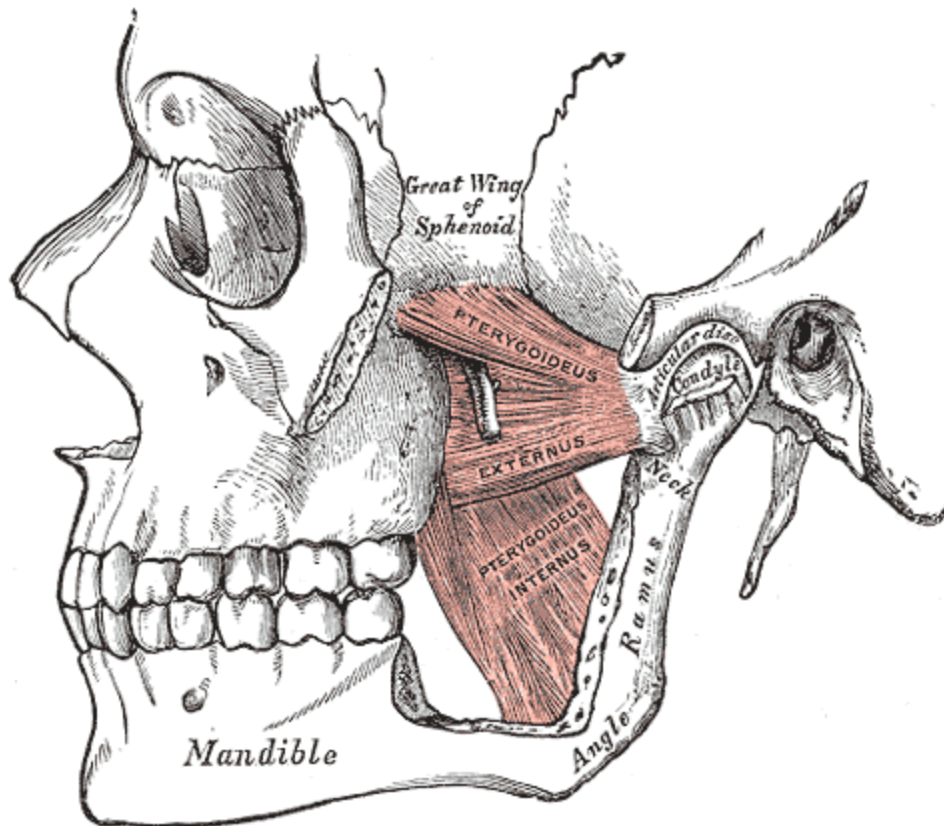
¹⁵⁶ Domenech MA, Sizer PS, Dedrick GS, McGalliard MK, Brismee JM. The deep neck flexor endurance test: normative data scores in healthy adults. *PM R*. 2011;3(2):105-110. [doi:10.1016/j.pmrj.2010.10.023](https://doi.org/10.1016/j.pmrj.2010.10.023)



Jaw (TMJ)







-Treating the neck (particularly the upper neck) is also a best practice when addressing a jaw issue, because an upper neck issue can cause pain and/or interfere with muscle control of the jaw.^{157,158}

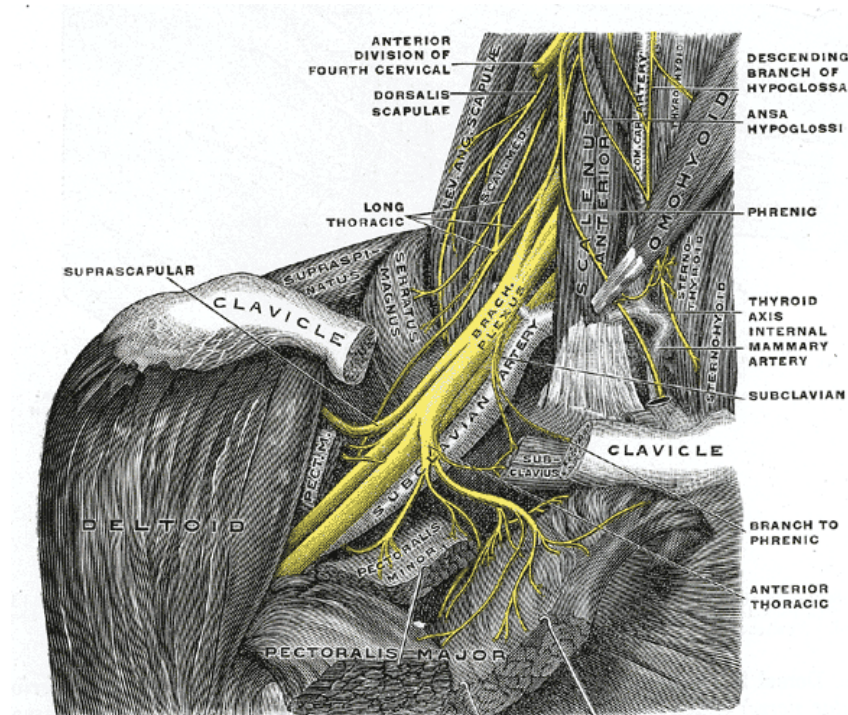
-The primary goal of a night guard is to protect your teeth from being damaged from grinding. Some report improvements in muscle tension as well. Overall, getting your muscles treated is more effective.¹⁵⁹

¹⁵⁷ Sanchla AD, Shrivastav S, Bharti L, Kamble R. Comparative Evaluation and Correlation of Pain Pattern in Neck Musculature Observed in Mild, Moderate, and Severe Temporomandibular Joint Disorder Cases as Compared to Non-temporomandibular Joint Disorder Cases. *Cureus*. 2022;14(10):e30099. Published 2022 Oct 9. [doi:10.7759/cureus.30099](https://doi.org/10.7759/cureus.30099)

¹⁵⁸ Ana Izabela S. de Oliveira-Souza, Josepha Karinne de O. Ferro, Manuella M.M.B. Barros, Daniella A. de Oliveira, Cervical musculoskeletal disorders in patients with temporomandibular dysfunction: A systematic review and meta-analysis, *Journal of Bodywork and Movement Therapies*, Volume 24, Issue 4, 2020, Pages 84-101, ISSN 1360-8592, <https://doi.org/10.1016/j.jbmt.2020.05.001>.

¹⁵⁹ Kapos FP, Exposto FG, Oyarzo JF, Durham J. Temporomandibular disorders: a review of current concepts in aetiology, diagnosis and management. *Oral Surg*. 2020;13(4):321-334. [doi:10.1111/ors.12473](https://doi.org/10.1111/ors.12473)

- The shoulder joint is the most unstable joint in the body.¹⁶⁰
- Asymptomatic (non-painful) rotator cuff tears have a prevalence somewhere between 8-40% in the general adult population (with increased prevalence in the elderly).¹⁶¹
- Surgical outcomes are quite positive.¹⁶²
- Some doctors just inject the shoulder joint. Some target the coracohumeral ligament as much as possible with ultrasound imaging guidance.¹⁶³
- The acromioclavicular (AC) joint: this is a good case to prove that arthritis doesn't equal pain because this joint rarely causes problems/pain in individuals and how bad it looks on X-ray or ultrasound rarely correlates to symptoms.¹⁶⁴
- Calcific tendinitis is when the body starts to deposit calcium crystals into the tendon.¹⁶⁵



¹⁶⁰ Cuéllar R, Ruiz-Ibán MA, Cuéllar A. Anatomy and Biomechanics of the Unstable Shoulder. *Open Orthop J*. 2017;11:919-933. Published 2017 Aug 31. doi:10.2174/1874325001711010919

¹⁶¹ Lawrence RL, Moutzourous V, Bey MJ. Asymptomatic Rotator Cuff Tears. *JBJS Rev.* 2019;7(6):e9. doi:10.2106/JBJS.RVW.18.00149

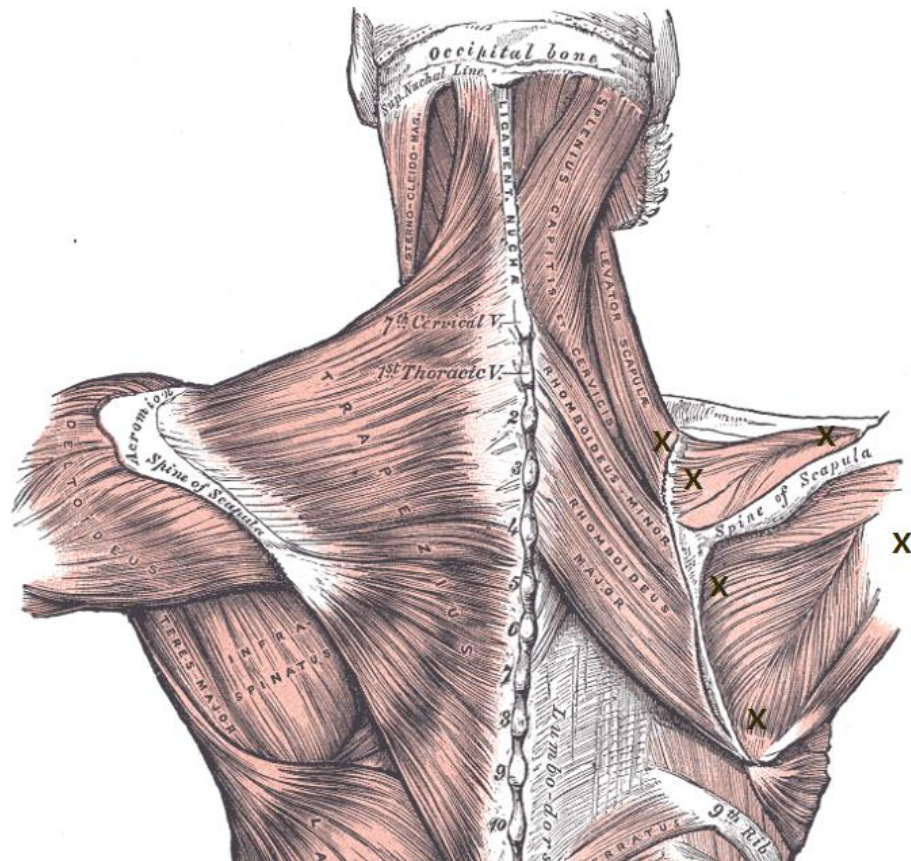
¹⁶² Narvani AA, Imam MA, Godenèche A, Calvo E, Corbett S, Wallace AL, et al. Degenerative rotator cuff tear, repair or not repair? A review of current evidence. *Ann R Coll Surg Engl.* 2020; 102: 248-255 <https://doi.org/10.1308/rcsann.2019.0173>

¹⁶³ McKean D, Chung SL, Naudé RTW, et al. Elasticity of the coracohumeral ligament in patients with frozen shoulder following rotator interval injection: a case series. *J Ultrason*. 2021;20(83):e300-e306. doi:10.15557/JoU.2020.0052

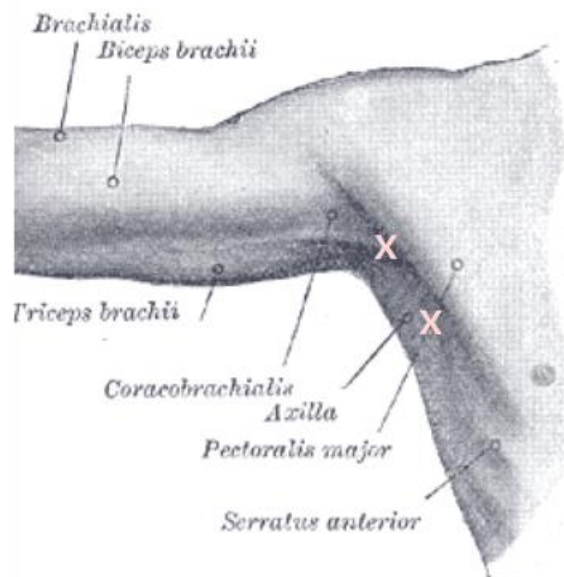
¹⁶⁴ Rossano A, Manohar N, Veenendaal WJ, van den Bekerom MPJ, Ring D, Fatehi A. Prevalence of acromioclavicular joint osteoarthritis in people not seeking care: A systematic review. *J Orthop*. 2022;32:85-91. Published 2022 May 20. doi:10.1016/j.jor.2022.05.009

¹⁶⁵ Kim MS, Kim IW, Lee S, Shin SJ. Diagnosis and treatment of calcific tendinitis of the shoulder. *Clin Shoulder Elb*. 2020;23(4):210-216. Published 2020 Nov 27. doi:10.5397/cise.2020.00318

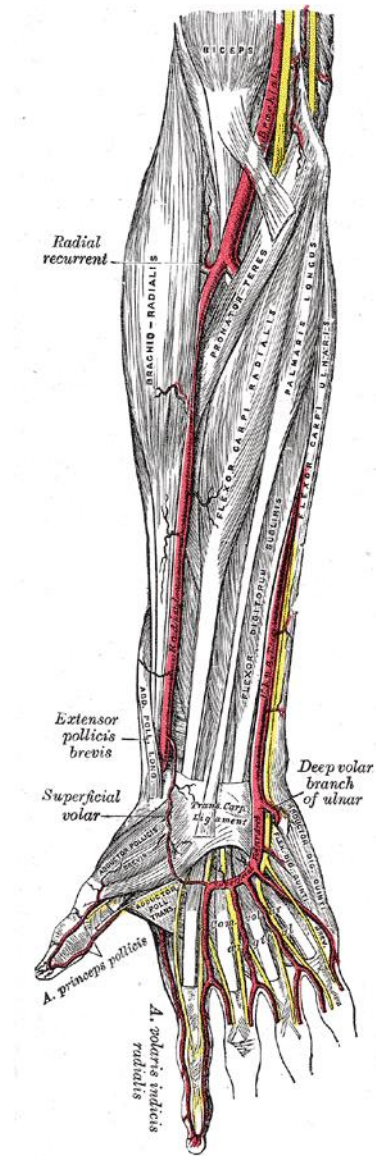
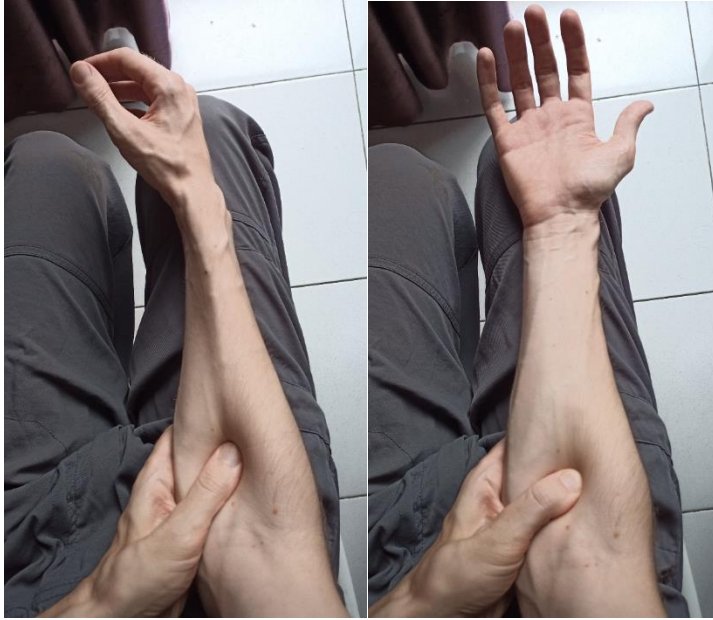
Common Shoulder Pain Muscle Knots 1



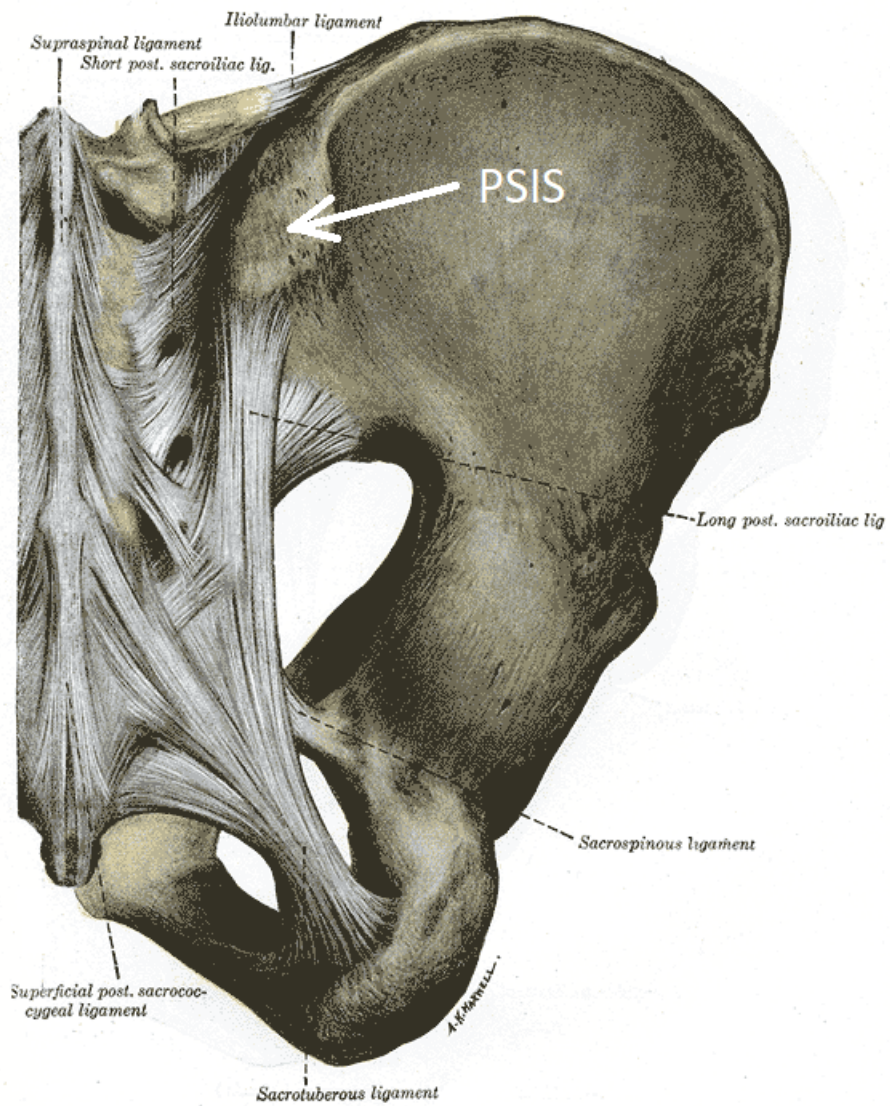
Common Shoulder Pain Muscle Knots 2



Elbow



Back/Pelvis



Systematic Literature Review of Imaging Features of Spinal Degeneration in Asymptomatic Populations (pain-free individuals) ¹⁶⁶ (W. Brinkikji <i>et. al.</i> 2015)							
	Age (yr)						
Imaging findings	20	30	40	50	60	70	80
Disc degeneration	37%	52%	68%	80%	88%	93%	96%
Disc signal loss	17%	33%	54%	73%	86%	94%	97%
Disc height loss	24%	34%	45%	56%	67%	76%	84%
Disc Bulge	30%	40%	50%	60%	69%	77%	84%
Disc Protrusion	29%	31%	33%	36%	38%	40%	43%
Annular fissure	19%	20%	22%	23%	25%	27%	29%
Facet Degeneration	4%	9%	18%	32%	50%	69%	83%
Spondylolisthesis	3%	5%	8%	14%	23%	35%	50%

-While the exact ratio is still up for debate, when it is really off, their (ultrasound) ability to predict chronic back tightness and/or back locking/spasms is basically perfect.¹⁶⁷

-In the event the pain is definitely coming from the coccyx, and it isn't getting better, they can surgically remove it and the results are pretty good.¹⁶⁸

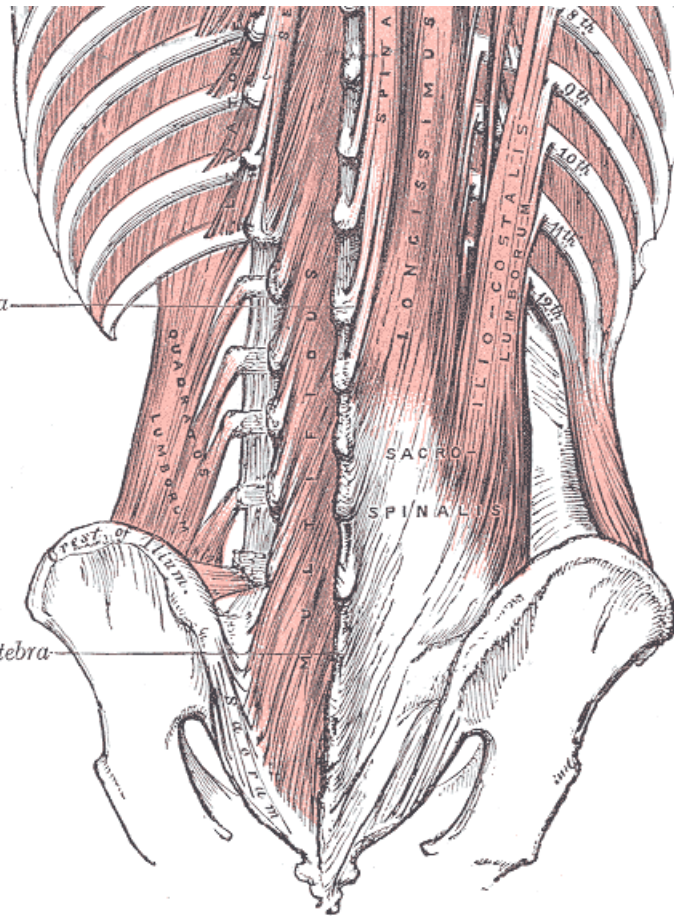
¹⁶⁶ Brinjkiji W, Luetmer PH, Comstock B, et al. Systematic literature review of imaging features of spinal degeneration in asymptomatic populations. *AJNR Am J Neuroradiol.* 2015;36(4):811-816. [doi:10.3174/ajnr.A4173](https://doi.org/10.3174/ajnr.A4173)

¹⁶⁷ Huang Q, Zhang Y, Li D, Yang D, Huo M, Maruyama H. The Evaluation of Chronic Low Back Pain by Determining the Ratio of the Lumbar Multifidus Muscle Cross-sectional Areas of the Unaffected and Affected Sides. *J Phys Ther Sci.* 2014;26(10):1613-1614. [doi:10.1589/jpts.26.1613](https://doi.org/10.1589/jpts.26.1613)

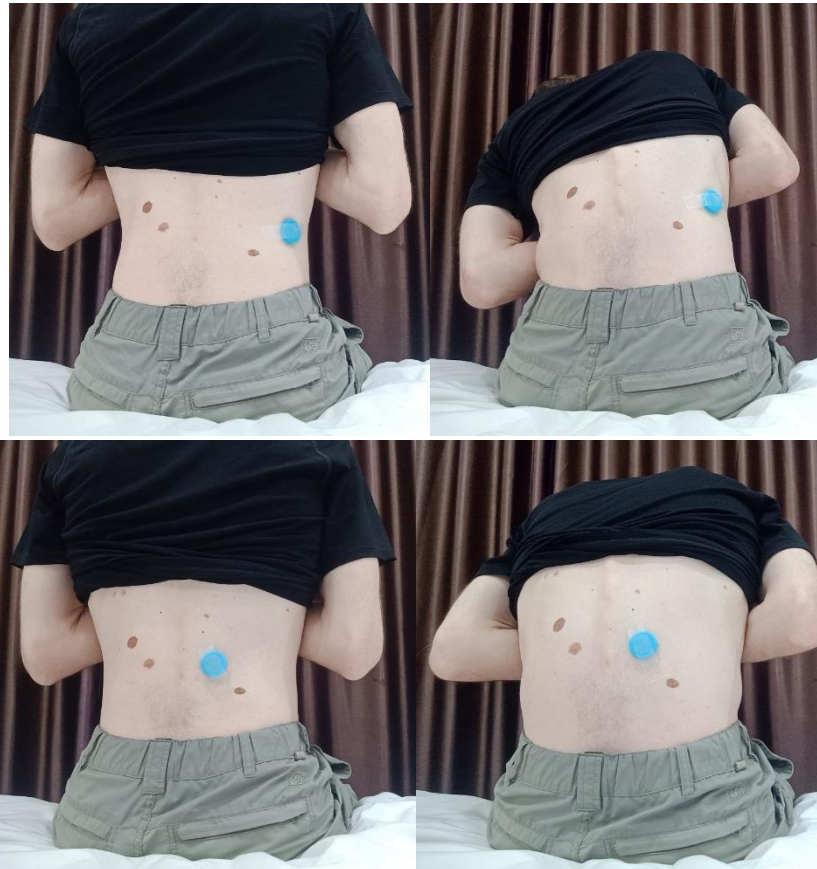
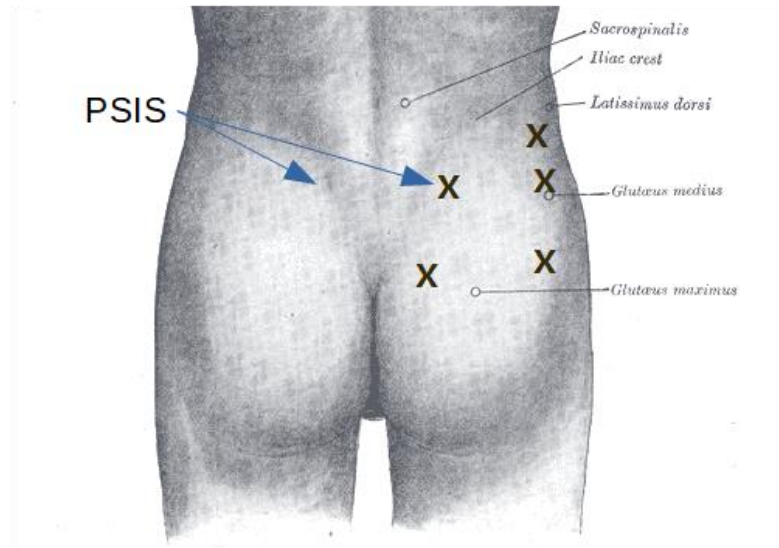
¹⁶⁸ Sagoo NS, Haider AS, Palmisciano P, et al. Coccygectomy for refractory coccygodynia: a systematic review and meta-analysis. *Eur Spine J.* 2022;31(1):176-189. [doi:10.1007/s00586-021-07041-6](https://doi.org/10.1007/s00586-021-07041-6)

First lumbar vertebra

First sacral vertebra

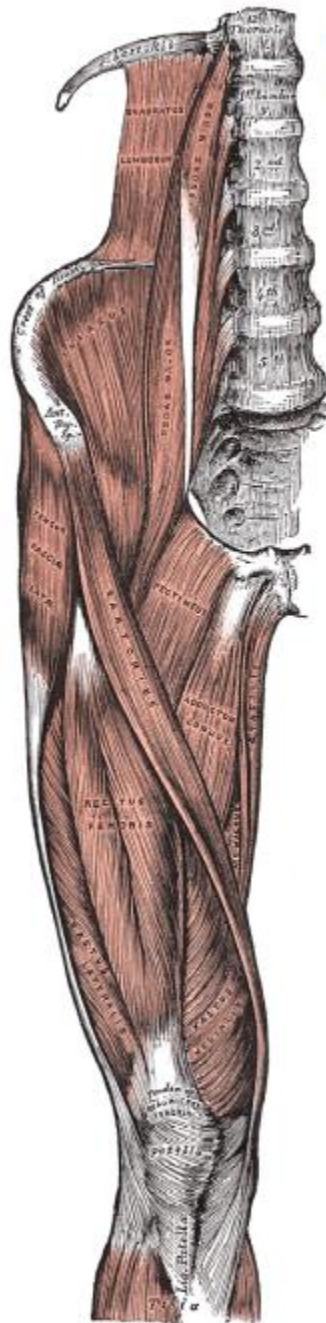


Common Pelvis/Low-back Pain Muscle Knots

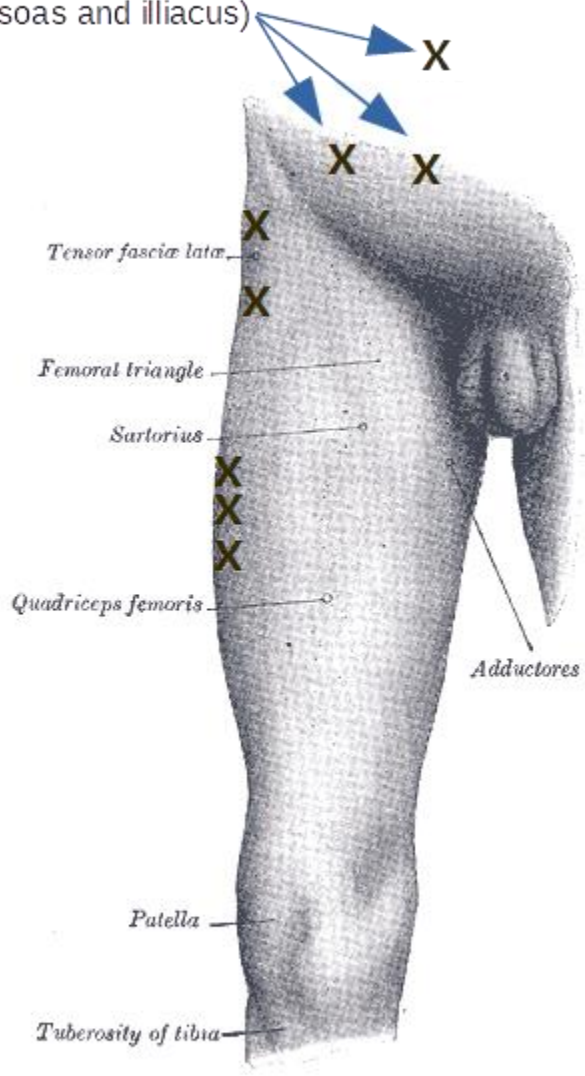


Hip

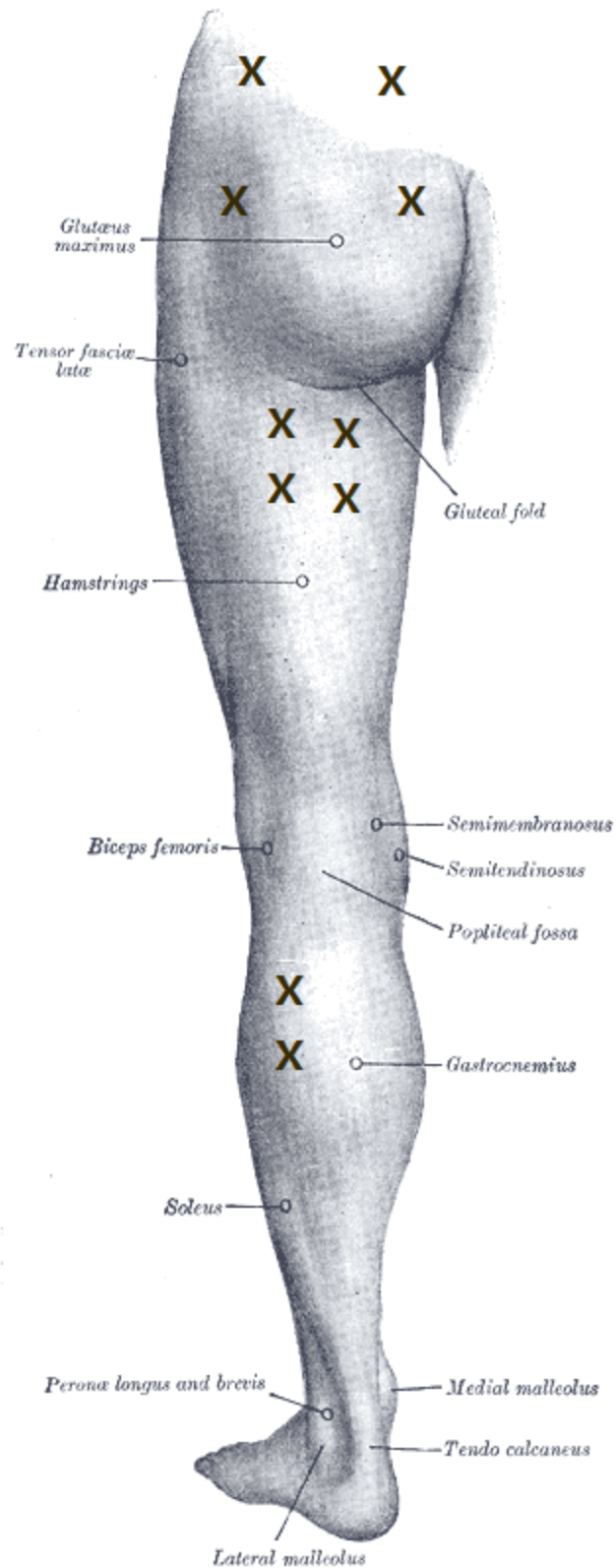
Common Hip/Leg Pain Muscle Knots 1

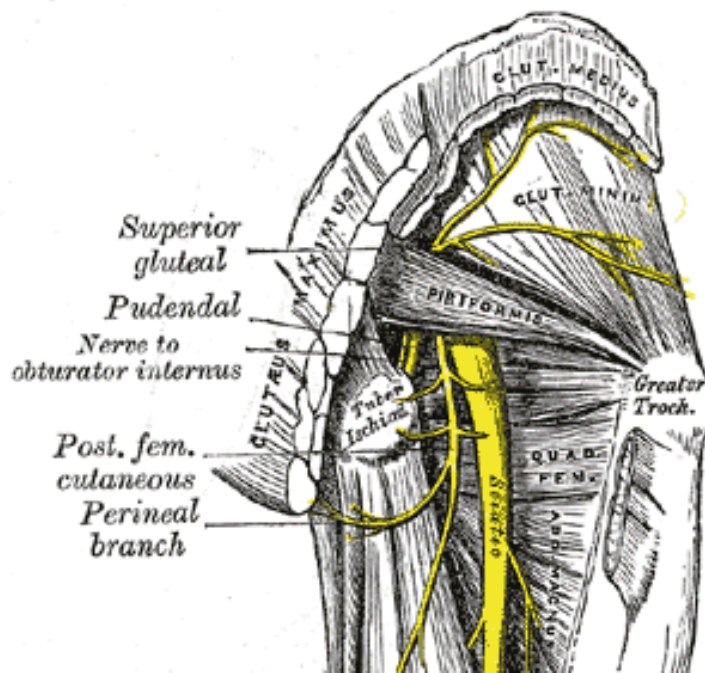


Deep in the abdomen
(psoas and iliacus)



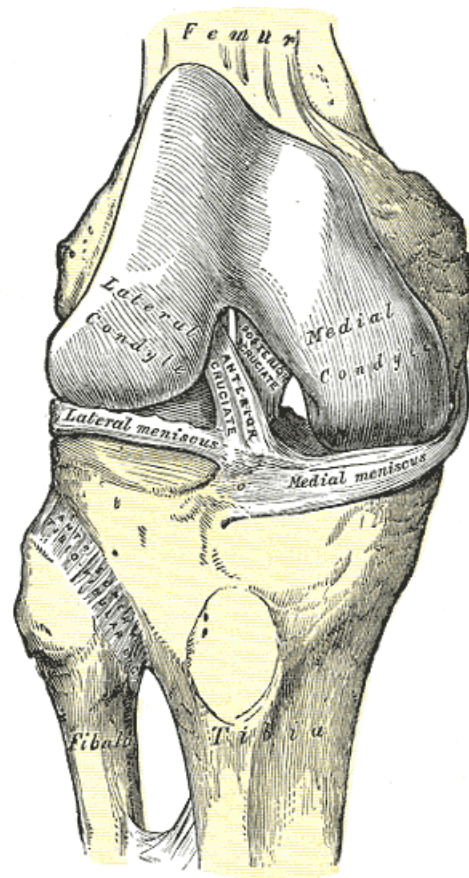
Common Hip/Leg Pain Muscle Knots 2







Knee



-The knees take a lot of abuse and are the most common joints to be replaced (with hip being the second most common).¹⁶⁹ In pretty much every study on exercises (including squats) they found improvements in stiffness, pain, and function.^{170,171}

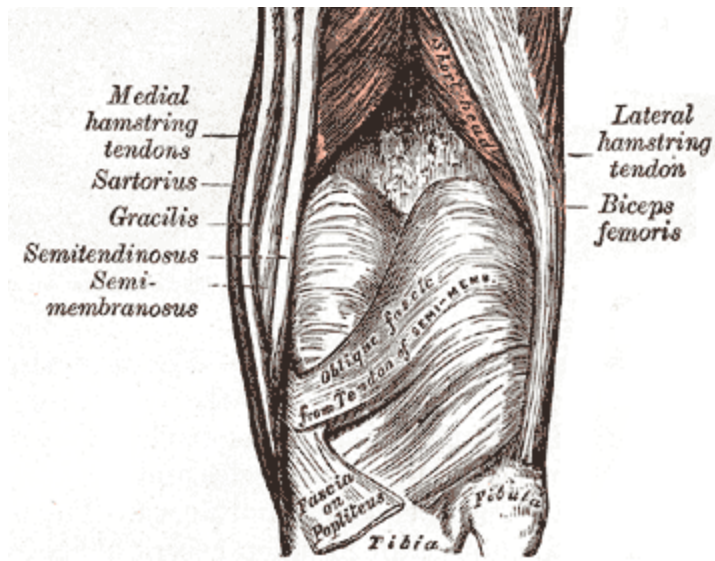
-In fact, ACLs can spontaneously heal, and it is debated whether you should repair it right away or wait to see if it fixes itself.¹⁷²

¹⁶⁹ Singh JA. Epidemiology of knee and hip arthroplasty: a systematic review. *Open Orthop J.* 2011;5:80-85. Published 2011 Mar 16. [doi:10.2174/1874325001105010080](https://doi.org/10.2174/1874325001105010080)

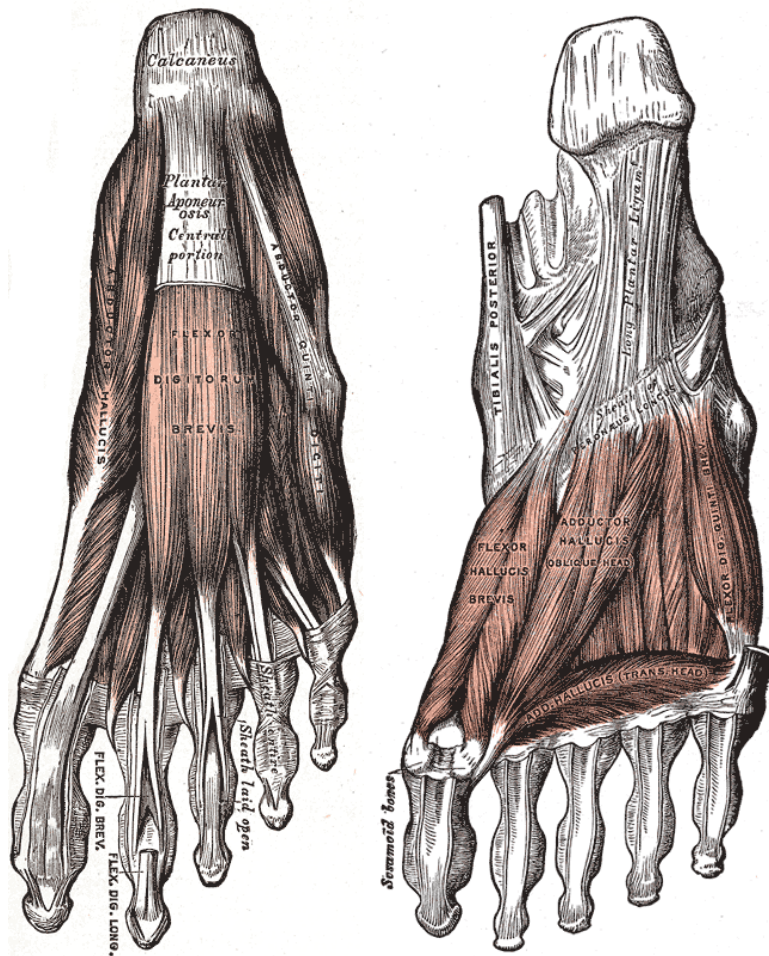
¹⁷⁰ Mo L, Jiang B, Mei T, Zhou D. Exercise Therapy for Knee Osteoarthritis: A Systematic Review and Network Meta-analysis. *Orthop J Sports Med.* 2023;11(5):23259671231172773. Published 2023 Jun 5. [doi:10.1177/23259671231172773](https://doi.org/10.1177/23259671231172773)

¹⁷¹ Raposo F, Ramos M, Lúcia Cruz A. Effects of exercise on knee osteoarthritis: A systematic review. *Musculoskeletal Care.* 2021;19(4):399-435. [doi:10.1002/msc.1538](https://doi.org/10.1002/msc.1538)

¹⁷² Blanke F, Trinnes K, Oehler N, et al. Spontaneous healing of acute ACL ruptures: rate, prognostic factors and short-term outcome. *Arch Orthop Trauma Surg.* 2023;143(7):4291-4298. [doi:10.1007/s00402-022-04701-0](https://doi.org/10.1007/s00402-022-04701-0)



Ankle/Foot



- One of the most common tendon issues in the ankle/foot are issues with the posterior tibial tendon (that holds up the arch of the foot).¹⁷³
- In one study, they found that 88% of patients were initially misdiagnosed, and waited an average of 43 months to receive the correct diagnosis.¹⁷⁴
- Confirmatory diagnosis of posterior tibial tendon dysfunction can very accurately and quickly be done through musculoskeletal ultrasound.¹⁷⁵
- You can make the exercise easier by not using a step, by using both feet for up and down, by reducing reps/sets, and/or by holding onto a counter/doing it seated. To increase the challenge

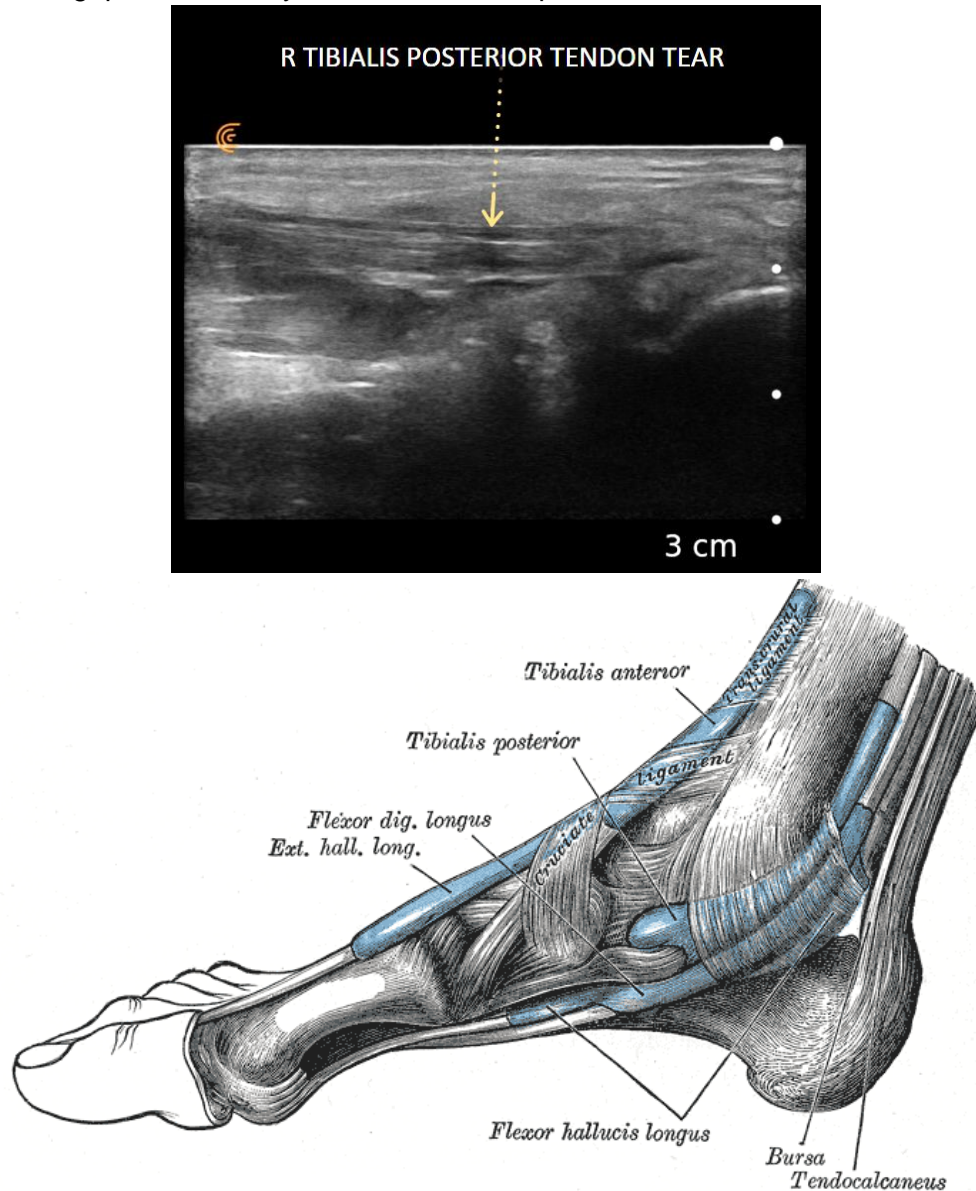
¹⁷³ Knapp PW, Constant D. Posterior Tibial Tendon Dysfunction. [Updated 2023 May 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK542160/>

¹⁷⁴ Mann FA, Thompson FM. Rupture of the posterior tibial tendon causing flatfoot. *J Bone Joint Surg* 1985;67A:556-61.

¹⁷⁵ Ramakko B, Point-of-Care Musculoskeletal Ultrasound in the Diagnosis of Tibialis Posterior Partial Tendon Tear: A Case Report. *J Int Acad Neuromusculoskel Med*. 2022 Dec;19(2):2-6

you can add weights, add a quick rebound at the bottom, and/or by using just one leg for both up and down.¹⁷⁶

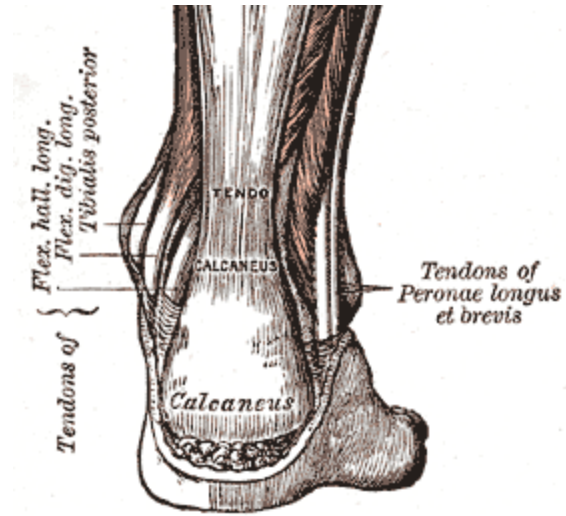
-Spraining your ankle once more than doubles your chances of spraining it again.¹⁷⁷ A whopping 40% of people who sprain their ankle go on to have chronic issues that persist more than 12 months: swelling, pain, instability, and more ankle sprains!¹⁷⁸



¹⁷⁶ "Achilles Tendinopathy Toolkit: Section D - Exercise Programs." *Physiopedia*, . 3 Dec 2022, https://www.physio-pedia.com/Achilles_Tendinopathy_Toolkit:_Section_D_-_Exercise_Programs

¹⁷⁷ Delahunt E, Remus A. Risk Factors for Lateral Ankle Sprains and Chronic Ankle Instability. *J Athl Train*. 2019;54(6):611-616. [doi:10.4085/1062-6050-44-18](https://doi.org/10.4085/1062-6050-44-18)

¹⁷⁸ Chen ET, Borg-Stein J, McInnis KC. Ankle Sprains: Evaluation, Rehabilitation, and Prevention [published correction appears in *Curr Sports Med Rep*. 2019 Aug;18(8):310]. *Curr Sports Med Rep*. 2019;18(6):217-223. [doi:10.1249/JSR.0000000000000603](https://doi.org/10.1249/JSR.0000000000000603)



About the Author

Dr. Ramakko spent most of his adult life teaching college-level physics in Montreal, Canada, but when his own health and the health of his loved ones declined due to indifferent and unsatisfactory healthcare, he took it upon himself to start his own healthcare education. He tries to share this knowledge as much as possible. He is unsatisfied with people's health being "good enough" and strives to get patients feeling their best and optimizing their quality of life. While happy to work with a variety of conditions, he has particular interest in chronic pain. To find out more or to book a session with him you can go to www.DrRamakko.com



Some highlights:

DIANM: Diplomate Status with the International Academy of Neuromusculoskeletal medicine indicating expertise in diagnosis and management as a "neuromusculoskeletal medicine specialist."

RMSK: "Registered in Musculoskeletal Sonography" indicating expertise in taking and interpreting diagnostic musculoskeletal ultrasound images.

DiplBLM: Board certified "Lifestyle Medicine professional." Advises patients in lifestyle interventions to treat, prevent, and/or reverse relevant chronic diseases.

As an Educator: Previously a full-time college physics teacher for seven years including serving as curriculum coordinator. Also holds a "Higher Education Teaching Certificate" from Harvard and a TEFL certificate.

As a Chiropractor: Trained in Oregon at University of Western States (UWS) as a primary care practitioner. Graduated "summa cum laude." Worked in his own practice in Texas and at a multidisciplinary clinic in the Cayman Islands. Trained in Acupuncture (Passed the NBCE acupuncture exam).

As a Researcher: Published six peer-reviewed articles (mostly in physics).