Aches and Pains
by
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Pain and Its Cause

Pain: everyone has felt it, whether they train with barbells or not. It’s part of the human condition to feel aches, pains, and tweaks of the neck, back, shoulders, knees, ankles, and just about everywhere else. Sometimes we can point to an immediate precipitating cause or injury and sometimes not. Sometimes the pain gets better quickly, and sometimes it lingers for days, weeks, or even years. As coaches, we get asked about aches and pains all the time, and since we like to analyze barbell training in terms of physics and classical mechanics, we’re tempted to treat the human body the same way when searching for an explanation for pain. We carefully watch people move as though they were robots, looking for the “bolt” that’s loose, the “screw” that might be a bit too tight, or the “alignment” that’s just a bit off.

Unfortunately when it comes to pain, this sort of rigid mechanical analysis doesn’t always lead to a satisfying outcome in musculoskeletal diagnosis the way it does in barbell training, and in this article I hope to explain why. We’ll also discuss some implications for treatment as currently practiced in medicine, physical therapy, and other associated fields.

Pain Neurobiology, an Overview

Note: The current theories of pain neurobiology could fill volumes of text, so as a disclaimer I’ll just say that this section will provide a very brief and simplified overview of the topic in order to frame our subsequent discussion as it pertains to diagnosis and treatment. There are numerous sources of additional information on the topic available online, the best of which can be found at Body in Mind and at Pain Science.

The traditional model of pain can be viewed as a “bottom-up” theory, starting at the tips of your peripheral nerves as they innervate the various structures and organs of your body and then converging along a one-way street towards your brain. It is sometimes referred to as the postural-structural-biomechanical model,[1-3] and the idea goes like this:

1. Structural abnormalities or tissue injury irritate special sensory nerves (or nociceptors).

2. A proportional signal is sent along “pain fibers” to your spinal cord, allowing immediate reflexes to take place (e.g, withdrawal from a hot stove).
3. The signal then continues upwards to “pain centers” in the subconscious and conscious areas of your brain, where

4. you perceive localizing pain in proportion to the intensity of the signal, and then attach a “negative” interpretation to this sensation.

It’s a simple and satisfying explanation at first, particularly when it comes to acute injuries like shutting the car door on your hand, stubbing your toe, or getting burned. However, it’s become so embedded in the way we think about pain that even in the absence of a clear precipitating event, patients and clinicians expect to get an X-ray, an MRI, or even surgery on a painful area and find concrete, objective evidence of structural abnormality or tissue damage – especially if the pain is “severe”.

Most acute injuries heal within about six weeks, and pain lasting beyond this point usually represents a syndrome where the pain itself is the problem, rather than injured tissue. This means that the longer pain lingers, the more the traditional model falls short. There are countless patients with debilitating symptoms from fibromyalgia, chronic pelvic pain, chronic back pain, or prior sexual/physical abuse who have undergone numerous examinations, MRIs, and laparoscopies with no evidence of structural pathology or tissue injury. There are many more walking around with objective radiographic evidence of severe osteoarthritis and herniated discs who have no symptoms whatsoever. For years these sorts of patients left physicians, neuroscientists, and therapists baffled and frustrated. How is it possible? What makes them so different?

This is where the emerging model of pain neurobiology comes through. The reality is much more complex in that the brain uses multiple additional inputs to modulate our sensory experience. In other words, while sensory signals travel up to the brain, the brain is simultaneously sending signals “downwards” to fine-tune the sensitivity of our nerves, to frame our sensory experience, and to adjust how we interpret a sensory stimulus. It does this based on things like our environment (e.g., sitting on the couch vs. fighting on the battlefield), our emotional state (happy vs. fearful, depressed, stressed, or anxious), and how long the pain has been present (seconds vs. years).

The brain integrates these factors together with the signals from peripheral tissues to generate what we ultimately feel. Pain is therefore a projection of the brain. This is known as the biopsychosocial model because it accounts for the effects of psychological and social factors in the experience of pain in addition to what’s actually happening biologically at the tissue level.

I know this sounds awfully touchy-feely, but bear with me. The mechanical model views the body strictly as a machine-like system of levers where the slightest imperfection, anomaly, or asymmetry results in malfunction and pain. The “system of levers” perspective is useful for analyzing the mechanics of barbell training, but consider: if such minor deviations from anatomical / biomechanical “perfection” were so crippling, they’d likely not last long on an evolutionary time scale. Instead, the biopsychosocial model views the body as a living organism with huge amounts of anatomic variation, and therefore tolerance for deviation, resulting in greater adaptability.

This model better reflects human experience and helps explain our widely varying and sometimes idiosyncratic responses to similar stimuli. Whereas one person might barely notice a needlestick for a blood draw, another patient with a history of severe anxiety, multiple hospitalizations as a child for chronic illness, and traumatic experiences with previous blood draws might scream in “10 out of 10” pain just as the needle begins to pierce the skin – and they aren’t “making it up.”

When dealing with chronic aches and pains, particularly in the setting of psychiatric or social stressors, the brain undergoes a process called “central sensitization.” This involves structural and physiological changes resulting in a hypersensitive nervous system that perceives pain far out
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of proportion to the degree of tissue injury (if any is present at all). It sometimes perceives pain in response to stimuli that would normally be considered benign, or even with no external stimuli at all. Someone with chronic nonspecific back pain who has frequent “flare-ups” might become so afraid of worsening pain that their brain “learns” to hurt with progressively less range of motion, lowering their pain threshold to the point where it becomes too painful to even pull their socks on.

This complexity makes pain a very challenging situation to treat effectively, and although there are some promising emerging ideas in the field we still don’t do a very good job of addressing the role of the brain.

Let’s now take a look at how this model applies to the current practice of musculoskeletal diagnosis and treatment. For the sake of discussion we’ll use low back pain, an extremely common phenomenon that almost everyone on the planet experiences, and run through a few examples of typical encounters with various practitioners.

The Chiropractor

Let’s say you first go to a chiropractor, the Kings of postural-structural-biomechanical thinking. They take a history and perform a physical exam, where they observe your static standing posture, measure the height of your hips and shoulders, assess leg lengths, spinal curvatures, range of motion, SI joints, pelvis, and perhaps check your feet for angulation or pronation. They’ll then show a convincing diagram of how your pain is the result of barely perceptible skeletal “misalignments” and recommend a manual adjustment to restore proper alignment, which should logically relieve your pain. Seems like it makes sense, right? So you get the adjustment done. After a rapid series of satisfying but meaningless snaps, crackles, and pops, you pay your bill, schedule twelve follow-up adjustments in advance, and waltz out of the office feeling nicely lined up.

Unfortunately the overwhelming evidence we have suggests that these purely structural findings correlate extremely poorly with pain. At this point we have ample data from the past 30 years showing a lack of association of back pain with postural asymmetry, thoracic kyphosis, lumbar lordosis, pelvic asymmetry/“tilt”, Q angles, spinal segmental range of motion, ligamentous laxity, foot mechanics, and even scoliosis.[1,6-9] We even have data showing no association of back pain with leg length discrepancy, an extremely common condition estimated to occur in up to 90% of individuals with varying degrees of severity.

Furthermore, even if these subtle anatomic findings were causing pain, we still have no reason to believe that acute or chronic spinal manipulation can produce clinically relevant, lasting structural change to the tissues. In which case, if the underlying structural anomaly is the sole cause of pain, people shouldn’t ever get better and would be expected to progressively worsen throughout life. Of course, this is not how things actually work.

I know, I know: I can already hear you exclaiming “But it worked for me!” Of course, if you read carefully you’ll notice that none of my argument is directed at whether or not chiropractic “works,” because that would require a whole separate article. Although the available evidence isn’t too encouraging, it might provide some short-term relief, for some people, some of the time.[10,11] With that said, my argument is focused on the inadequacy of the mechanical model’s explanatory power for both the cause of pain and for its ultimate relief.

Although this might still seem controversial, it really shouldn’t come as a huge surprise. Humans are not assembled using identical parts along an assembly line; there is a huge amount of anatomical
variation and inherent asymmetry in the human species. Our evolution has therefore demanded a large
degree of tolerance for structural anomalies, asymmetries, and “bad posture” – at least much more than
your chiropractor would have you believe.

How, exactly, do we define “Good Posture” in a way that is broadly applicable and clinically
useful? To date, it hasn’t – and can’t – be done.[12] There simply isn’t one good posture, no matter what
your mother or favorite posture guru claims. Part of the problem, therefore, lies in how we define the
normal limits of anatomy. Artificially restricting these limits to require perfect symmetry increases the
number of people labeled “abnormal,” and therefore the number of treatments needed.

Now, I’m not suggesting that Chiropractors are greedily doing this for financial gain; instead,
I’m arguing that the theoretical basis for the entire Chiropractic field (i.e, the postural-structural-
biomechanical model) is wildly exaggerated and, to date, is not supported by the overwhelming weight
of scientific evidence.

In summary: Your skeleton is not a fragile little snowflake. “Good posture,” skeletal symmetry,
and “alignment” – to the extent they can even be achieved – are far, far less important than advertised.

The Massage Therapist

Instead of the chiropractor, let’s say you went to a massage therapist for the same low back pain. They
similarly take a history and perform a physical exam, where they lie you down on the table and examine
the various soft tissues around your spine and hips. They’ll poke and prod for a while, meticulously
feeling the character of your muscle, tendon, and fascia before exclaiming “Wow, you’re really tight!”

They might describe how your pain is due to a specific pattern of tight muscles or perhaps
“fascial restrictions” and “tissue adhesions” that they can feel, which supposedly limit smooth sliding
of the tissues past one another. Some delve even further into the rabbit hole of fascia pseudoscience,
where fascial “meridians” interconnect all your organs, influence their function, and communicate
with your nervous system. Impressed, you consent to undergo a deep tissue massage or Instrument-
Assisted Soft Tissue Massage (IASTM) to “release” your tight muscles and fascia. After thirty minutes
of pain and more pseudoscientific babbling, you pay your bill and skip out the door feeling especially
limber and loose – perhaps with a few new sore spots and bruises across your back as well.

You might be surprised to learn that there is no correlation between soft tissue texture (i.e.,
what the therapist is feeling) and pain, functional impairment, or tissue pathology.[13-19] While you
might feel “really tight” in a particular spot, this observation is meaningless in practical terms. This has
been studied, and therapists just can’t tell, even if they think they can. Could “tightness” be the cause?
Could it be the result? Could it be completely coincidental? Based on the available evidence: tightness
doesn’t consistently hurt, and pain doesn’t consistently “tighten” … or change a muscle’s texture at all.

Of course, I won’t deny that getting a massage or other forms of manual therapy can feel good
and can sometimes make stubborn aches and pains feel better.[20] And “myofascial / trigger point
pain” does seem to describe a real (and likely underdiagnosed) phenomenon, although the mechanistic
science of it is still unclear. But regardless of whether your massage “worked,” your pain probably
wasn’t coming from a specific pattern of tightness that is objectively detectable (and treatable) by
palpation. Fancy-sounding “fascial restrictions” don’t actually seem to exist, much less cause pain or
organ dysfunction. And even if they did occur, fascial “release” is impossible without a scalpel. Once
again, before typing out your angry comments, understand that I’m arguing against the mechanical
model and its associated pseudoscience, not whether you personally got relief from a massage or
manual therapy.
And the available data supports this: for example, when 400 people with low back pain received either expert massage based on these supposed soft tissue structural problems, versus nonspecific Swedish-style relaxation massage (essentially “placebo massage”), there was benefit to both – but no difference in pain outcomes between the two.[21] It has been suggested that the evidence for massage improving depression, anxiety, and feelings of stress might better explain the benefits observed for back pain.[13,22] Clearly, this mechanism would fit perfectly in the biopsychosocial context.

When it comes to Instrument-Assisted techniques like “Graston,” which uses a $2700 set of steel tools to scrape your muscles, tendons, and fascia, the evidence is similarly poor. For example, the current evidence for Graston technique includes a handful of low-quality case reports, a few studies using rats or clinically irrelevant endpoints like regional blood flow and fibroblast concentration, and – perhaps the only one worth mentioning – a 143-participant randomized controlled trial comparing Graston, Spinal Manipulative Therapy (chiropractic adjustment), and “sham” (placebo) treatment for thoracic back pain. This trial showed that all three groups’ pain improved over time, with no differences between the groups at 1, 3, 6, or 12 months post-treatment.[23] Think about that for a second before you spend a bunch of money to get already painful areas of your body scraped with steel blades in the hopes of “releasing” imaginary restrictions, adhesions, and tightness.

In summary: Massage therapists cannot reliably correlate palpable tissue texture (e.g. “tightness”) to pathology, and this texture has no predictive value for pain. When massage and manual therapy do work, might there be other mechanisms at play?

The Physician

Let’s say you instead visited a physician. Low back pain is one of the most common reasons for visits to physicians despite the fact that most doctors are not particularly adept when it comes to musculoskeletal evaluation and diagnosis.[24-26] Visits to physicians in Sports Medicine, Orthopedic Surgery, and Physiatry (also known as Physical Medicine & Rehabilitation) are common – and although far less prone to outright quackery, these docs are often just as likely to think in structural-biomechanical terms. This leads them to search for anatomical targets for intervention using corticosteroid injections, nerve blocks, or often-unnecessary surgeries.

Most will begin with a history and physical examination, assessing for focal tenderness, active and passive range of motion, strength, sensation, deep tendon reflexes, and perhaps some special exam maneuvers to evaluate particular problems, such as a leg raise for radiculopathy due to a herniated disc.

If something concerning is found on initial examination, or if the pain has been persistent for several weeks, most will order an X-ray or MRI. In the case of low back pain, this imaging might show evidence of degenerative disk disease (or spondylosis), spinal stenosis, disc herniation, spondylolysis / spondylolisthesis, or other dangerous-sounding structural pathologies.

At this point we again run into problems. Unfortunately, MRI-proven pathology has an incredibly poor correlation with symptom onset, severity, duration, or prognosis. Around 40 percent of completely pain-free adults have evidence of bulging or herniated discs on MRI imaging, even higher proportions have asymptomatic disc bulges, and one trial even showed 93% of asymptomatic individuals over 60 had objective disk degeneration.[6, 27-29] The presence on MRI of spinal stenosis, spondylolysis, and spondylolisthesis similarly have poor correlation with pain, as the majority of these conditions are actually asymptomatic (although they certainly can cause symptoms).[1,30,31]

So even though the MRI pictures are staring us in the face, we still can’t be confident that what we see is the sole cause of pain. We therefore can’t be confident that surgery will fix the pain. Of course,
an emergency situation like acute spinal cord compression needs surgery. But otherwise, despite their
ominous names these spinal conditions have a very good long-term prognosis, and patients tend to
experience substantial improvement over time regardless of whether they get surgery or not.[6,32]

Although we have limited controlled data on surgical interventions like spinal fusion, discectomy, laminectomy, or vertebroplasty, studies often show some immediate benefit for pain, but this typically fades over time when compared to nonsurgical intervention.[6,32-39] In other words, by a few months to a few years post-operatively, there’s no difference in pain outcomes for most common spinal conditions. It gets worse: spinal fusion for most degenerative disks, herniated disks, and radiculopathies appears to be downright harmful over the long term, causing increased disability, opiate use, and prolonged work loss with less likelihood of return to work.[40] In short: outside of a “slam-dunk” indication, extreme caution is required prior to undergoing surgery for common spinal degenerative conditions.

By this point you shouldn’t be surprised to learn that patient expectations and psychosocial factors (as predicted by standardized questionnaires for depression, anxiety, fear, etc.), not the severity of disease upon imaging, are the strongest predictors of whether they will return to work or experience future disability from pain.[41-43]

In fact, MRI appearance seems to have no predictive value at all for future pain or disability – even worse, just undergoing an MRI appears to be an independent risk factor (i.e, not related to disease severity) for future pain and disability.[44,45] In other words, just learning that your MRI shows ominous spinal “degeneration” is enough to make your pain worse and last longer. This fascinating phenomenon is known as the nocebo effect, and it fits perfectly in line with the biopsychosocial model where the brain has ultimate control over your perception of musculoskeletal pain. Consider that before the next time you try to pressure your doctor into ordering a spinal MRI.[46]

In summary: When the doc says that, based solely on your MRI results, you should either get surgery or invest in a rolling walker, take some Vicodin, and definitely avoid lifting heavy weights so you don’t “blow your back out”… they’re probably wrong.

The Physical Therapist

Finally, how about a physical therapist? They play a hybrid of multiple fields, taking bits from chiropractic, massage, medicine, and exercise science. They, like everyone else we’ve discussed, are quite used to seeing patients with low back pain. And I will say that PTs appear to be the earliest adopters of the biopsychosocial model of pain, although the majority still practice in a strictly structural mindset.

They’ll begin with an evaluation to see if the patient is appropriate for physical therapy – for example, making sure they don’t have unusual symptoms suggesting untreated systemic disease or other such causes for their pain. Next they’ll try to determine whether there is obvious injury or acute anatomical pathology, such as a torn ACL. If not, they’re probably dealing with one of those pesky pain syndromes, like chronic nonspecific back, knee, or patellofemoral pain syndromes.

At this point they’ll subject the patient to a battery of physical assessments, measuring certain skeletal parameters, assessing soft tissue qualities, as well as basic strength, range of motion, flexibility, and a number of other tests. And of course, at some point in this battery of tests they’ll likely find something, such as skeletal asymmetry, muscle “tightness,” “overactivity,” “weakness,” or “shortening,” and, if all else fails, diagnose “core instability.” This finding allows them to blame your pain on something that can be directly intervened upon, whether it is truly the cause of your pain or – more likely – not.
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Having already discussed the problems with over-interpreting static posture, skeletal asymmetries, or differences in palpable tissue characteristics above, let’s discuss some of these other problematic diagnoses that are commonly made by physical therapists. Specific muscular “weakness,” “inhibition,” and “imbalance” are more often the pet diagnoses in the PT realm, although “tightness” (e.g. of the hamstrings, psoas, piriformis, or shoulder girdle) often comes into play as well.

Although “tightness” was discussed above in the massage section, it’s also worth mentioning that hip flexor, hamstrings, and psoas tightness have shown no predictive value for the development of back pain in prospective trials.[1,47,48] Chronic “shortening” of muscles (e.g. hip flexors) related to sitting is another common scapegoat for back pain; unfortunately, there is no evidence that this actually occurs – as opposed to true muscular contracture as seen in patients with cerebral palsy or chronic immobilization.

“Imbalances” are yet another common culprit, although we have data showing objectively measured imbalances in the spinal erectors to have no relationship to back pain.[49] And as for “weakness,” well, this one should intuitively seem suspicious. As a hospital-based physician, essentially all of my patients are weak. Why don’t they all have back pain? Are there special patterns of weakness required to produce pain? How are these patterns defined, objectively and reliably identified, and then causally attributed to specific pain symptoms? Why do some weak people have pain, and others don’t?

For example, the “Upper Crossed Syndrome” and “Lower Crossed Syndrome” are wholly fictional postural conditions describing specific patterns of tightness, inhibition, imbalance, and weakness as the cause of people’s pain. There is no evidence supporting the existence of such a syndrome, practitioners can’t even agree on the specifics of diagnosis in real patients, and the assumption of so-called “crossed” postures has no substantiated correlation with pain. You can easily identify people out in public with head-forward postures (seen in UCS) or lordosis and anterior pelvic tilts (seen in LCS) who are asymptomatic from such hopelessly “bad posture”.

As an aside, one amusing study recently published by four physical therapists took 30 asymptomatic college students with “forward head posture” suggestive of Upper Crossed Syndrome, had them do neck self-stretches and assorted trapezius exercises for 4 weeks, then measured the temperature of the back of their necks (???).[50] The statistically significant difference in neck temperature, of course, suggests that: “muscle-strengthening exercises for the upper and lower trapezius and stretching exercises for the rhomboids and upper trapezius have a positive impact on upper crossed syndrome by increasing body temperature. Hence, the findings of this study can be used to prevent and treat upper crossed syndrome.”

There you have it, folks. Science, worthy of the Annals of Silly Bullshit.

Therapists may also diagnose problems with motor control or “timing” of contractions of the trunk musculature (the “core”). These findings also have not been consistently related to back pain; it seems more likely that any neuromuscular “timing” issues would be the result of back pain, rather than the cause.[1] The past several decades of research has repeatedly shown various modalities of highly specialized “core” exercise to have no benefit in preventing or treating back pain over regular old exercise (though there have been no studies of basic barbell training).[1,6,51,52] Despite all this, it’s easy enough to find a position or posture where a patient immediately feels unstable, giving the therapist just enough time to slap on a diagnosis of “core instability”. This unfortunately remains everyone’s favorite unsubstantiated wastebasket diagnosis for folks without apparent structural explanations for their pain.

In Summary: Your pain isn’t solely coming from skeletal asymmetry, or from muscles being “imbalanced,” “weak,” “shortened,” or “unstable”. Benefits obtained from physical therapy as it is
typically practiced are more likely due to the passage of time than targeted strengthening interventions on your gluteus medius.

### Miscellaneous New-Age Quackery

There are many more variations of the postural-structural-biomechanical model of pain that have been invented, turned into expensive certifications, and sold to the public. For the sake of time (and article length) we’ll just mention one and refrain from delving deeper down that rabbit hole today.

“Rolfing” is a “holistic system of soft tissue manipulation and movement education that organizes the whole body in gravity,” all of which are buzzphrases devoid of any meaning, just as the method is devoid of any plausibility or scientific merit. Originally developed by a physical therapist, it is based on the idea that “most humans are significantly out of alignment with gravity,” (whatever that means), and that “bound up” fascia must be manually separated from muscle tissue to enhance function and *emotional state*. Yes, really. Needless to say, there is not a shred of quality evidence supporting any aspect of this technique for any outcome whatsoever. Full certification costs upwards of $30,000, which I presume is what it must cost to learn how to meticulously separate fascia from muscle without using a scalpel.[53]

These are just a few among a sprawling cornucopia of structural-based quackery, including Craniosacral therapy, Functional Patterns, Anatomy Trains, the Integrated Systems Model, Prolotherapy, Alexander Technique, Thoracic Ring Theory, Reflexology, Bowen therapy, Feldenkrais, Shiatsu, “postural rehabilitation,” and the list goes on. All of these methods sell expensive certifications reflecting their pet theories built on structural models of pain, which I’ve now hopefully convinced you is far less important than advertised.

### Conclusions

My absolute biggest problem with everything I’ve discussed so far, the thing that really pisses me off as a physician, is the fact that a desperate, anxious patient could present to every single one of these practitioners and potentially receive a different diagnosis. The inter-rater reliability is so bad that this often occurs even among practitioners of the same field.[1,54-59] They won’t agree on what specific structure needs adjusting, release, strengthening, stabilizing, or whatever other intervention is fashionable.

Regardless of this, they’ll still provide a confident, complex, scientific-sounding explanation for their diagnosis, which will always lie squarely within their scope of practice and which needs their specific treatment. It’s a frustrating combination of hubris, confirmation bias, and (sometimes) greed all rolled into one. This is wrong, regardless of whether or not their treatments ultimately provide any pain relief. Selling the placebo effect as advanced therapy is unethical and is not a long-term solution. Admittedly, this article presents generalized views of practice patterns in each field, and of course there are exceptions out there, practitioners who do good for their patients (some of whom are therapists I deeply respect), but they remain few and far between.

In the absence of obvious acute injury or emergent medical conditions, how should we treat people’s nagging aches and pains? Unfortunately there’s no single way, and going into detail on the topic would require an article (or book) even longer than this one. But, with the biopsychosocial model in mind, we can suggest a few important steps:

1. Managing stress, anxiety, and depression (much easier said than done)
2. Education about back pain to reduce the fear that your pain is reflective of constant “danger”

3. Getting adequate sleep

4. Avoiding use of opiate pain medications and “muscle relaxants” (although acetaminophen/NSAIDs may be helpful)

5. Exercising – or, even better, training – to move through previously “threatening” ranges of motion

6. Continuing to participate in normal activities (i.e, avoiding immobility!)

In addition to these steps, massage, a chiropractic adjustment, some physical therapy, or even seeing a physician might help as adjunctive measures and might be worth a shot. Still, some caution is warranted. If you encounter someone who describes their “one true cause” of pain or confidently offers relief through a single treatment modality, watch out. Additionally, depending on the practitioner, they might impart a harmful nocebo effect if they harp on your imaging findings or warn of imminent structural failure unless you get their treatment. Don’t get caught up in the mechanical doom-and-gloom mindset.

Although the current data does not show significant benefits of targeted “core” strengthening or specialized exercise prescription compared to “regular,” nonspecific exercise, our preference for physical intervention involves the application of gradual progressive overload through basic barbell training, for reasons described at length elsewhere. Our collective experience with this method has given us a clear idea of its effects in healthy populations, despite the lack of controlled trials. Even if it means starting with bodyweight or the 5-kilo aluminum training bar, it seems to build strength and the confidence that you are not broken more reliably than any other exercise model in existence. A competent, reassuring, and experienced coach can help guide gradual progress. But, depending on the nature of your pain, it may not be a cure-all and the other factors we’ve discussed demand consideration as well.

I’ll now close with one final disclaimer. In addition to being a physician and (obviously) a skeptic, I am also a Starting Strength Coach. I observe and correct biomechanics under the barbell. Note that I spent the past 5,000 words arguing that posture, structure, and mechanics alone are insufficient to explain pain, not that mechanics “don’t matter”. Although the available data shows a very low incidence of weightlifting-related injuries, I still don’t allow clients to deadlift with rounded backs, squat with caved-in knees, or bench press with wildly flared elbows (although when you think about it, people have done all of these things without pain). Biomechanics remain important when moving under the barbell, where the external load is amplifying the forces on your body’s tissues and therefore reducing their tolerance for gross deviations. Biomechanics are also useful under the barbell to distribute stress in a way that produces the adaptations we seek while minimizing our risk for acute injury. And although we don’t have a randomized controlled trial comparing the novice linear progression using rounded-back deadlifts versus flat-back deadlifts, I wouldn’t recommend playing the “skeptic” card there.
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for clients of all ages. As of 2015 he had achieved personal best lifts of a 530 lb squat, a 405 lb bench press, a 600 lb deadlift, and a 1505-lb raw competition total at a bodyweight of 192 lbs.

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