Addressing Concerns about Yin Yoga

The practice of Yin Yoga can generate many heartfelt opinions, from the euphoric to the demonic. Many students who have been practicing yin for years rave about the benefits they have received and how much they love it. But there are also many students, teachers and studio owners who believe the practice to be dangerous and ill-conceived. What is the reality? Should Yin Yoga be avoided by all and sundry or eagerly embraced?

Like most things in life, the answer is not black and white. It is the nature of yin to turn into yang, and yang to turn back into yin, like the turning of the seasons and day into night. The real question is not “Does Yin Yoga work?” but rather “Does Yin Yoga work for me?” If the answer is “yes,” then how can anyone deny your experience? There is no medicine or therapy that will work for every body, but this does not mean that these therapies work for nobody. The same applies to yoga in general and Yin Yoga specifically.

Whether there exists solid scientific evidence to support your personal experience should not diminish that experience. Your experience is a data point that science has to evolve to accommodate and explain, not the other way around. The fact that the maps, models and paradigms used by scientists may not be able to explain your experience does not mean what you went through was invalid or unreal. This is true regardless of whether your yin experience was positive or negative. But it is always interesting and comforting to see if science can at least explain why your experience

was what it was. We feel on solid ground when our own map shows how we got to where we are.

The intention of this document is to address many of the common concerns that I have heard raised about Yin Yoga. The approach will be to list the concerns about Yin Yoga, and then provide insights and counterpoints. Sometimes the response will be lengthy and detailed, but often the commentary will be brief and will consist of links or pointers to more complete discussions already documented elsewhere. In this way, this overview document can serve as a directory of responses that can be updated as new discussions occur.

Before we can dive into addressing these concerns, it is important to define what I mean by Yin Yoga, because there are many different types of yoga going by the same name. I would suggest that your exploration of the topics below begin with the first topic: What is Yin Yoga?

I hope you find this valuable. If you would like to provide comments about this document, please feel free to do so at this thread on the Forum at www.YinYoga.com.

Cheers
Bernie Clark

To view the online version of this document, visit https://yinyoga.com/concerns/

Topics

What is Yin Yoga?

Yin is dangerous because …

- You shouldn't stretch ligaments, tendons, joints, connective tissue or fascia
- You shouldn't stretch joints
- To protect joints, we must engage muscles, not relax them
- Passive stretching is not safe
- You shouldn't stretch nerves
- Holding stress for a long time is destabilizing
- Holding for time make tissues weaker (due to creep) and thus more likely to be damaged
- Yin Yoga involves crunching of the spine and long-held compressions
- Yin Yoga is bad for the muscles
- Yin Yoga will not trigger the parasympathetic nervous system
- Yin will trigger traumatic memories
- I know someone who was hurt doing Yin Yoga

Yin Yoga is not good for…

- Yin Yoga is not good for pregnant women
- Yin Yoga is not good for hypermobile students
- Yin Yoga is not good for yoga beginners
- Yin Yoga is not good for people with cancer
- Yin Yoga is not good for people with osteoporosis
- Yin Yoga is not good for people with fibromyalgia
- Yin Yoga is not good for athletes

Miscellaneous concerns:

- There is no scientific proof that Yin Yoga works
- Yin Yoga comes from martial arts and is an advanced, extreme practice
- Paulie Zink doesn't like "popular" Yin Yoga
- Yin Yoga is not a complete practice
- Yin is Chinese/Yoga is Indian—the two don't mix
- Hot yin is bad
- Yin Yoga is simply restorative yoga

What is Yin Yoga?

Yin is an adjective, although the term is sometimes used as a noun. That's okay; there is no need to be dogmatic. Yin and yang are relative: nothing is absolutely one or the other. Consider the famous taijitu symbol shown here. Notice how even within the dark, yin swirl there is a white, yang dot, and vice versa. Notice also how there is an energetic movement between the swirls: yin becomes yang and yang become yin.

Yin describes things that are relatively darker, denser, cooler, hidden, more interior, more feminine, more mysterious. It literally refers to the shady side of a hill or river. Yang describes things that are relatively brighter, lighter, warmer, more superficial, more obvious. It refers to the sunny side of a hill or river. Yin also is relatively wetter while yang is dryer. These attributes can be applied to our yoga practices. In general, a very physical, hot, active practice would be considered yang relative to a calmer, cooler, more passive practice. For example, restorative yoga is yin-like relative to vinyasa yoga, which is yang-like.

The practice of Yin Yoga incorporates the yin elements of passive, non-striving, long-duration stresses targeting the yin-like tissues of the body—the fascia, which includes the ligaments, tendons, joint capsules and even the bones. There are 3 or 4 general principles followed in the practice of Yin Yoga as developed by Paul Grilley:

1. When coming into a pose, come to your first stopping point and relax (don't force past your edge). This is the place where there is some challenge, but not the maximum stress. (Maximum stress would make this a yang practice.)
2. Once you have reached the appropriate edge, where you are feeling some reasonable amount of stress, relax. Become still. If your edge moves, however, and there is no more challenge, it is okay to move to find a new edge. But we are not looking for the greatest range of motion (yang); we are looking for reasonable sensations (yin).
3. Stay in the posture for time. The amount of time will vary, but generally it is 1 to 10 minutes, depending on the person and the posture. When the sensations grow too intense (too yang), it is time to back off or come out of the pose (yin). *Time is more important than intensity.* It is better to linger longer at a lesser depth than to go deeper.
4. When coming out of a pose, come out slowly, gingerly. The pose does create a sense of fragility; you have been literally pulling your body apart. Give yourself time to enjoy the rebound period between postures as the body returns to neutral.

The practice of yoga affects us on many levels: physically, emotionally, mentally and even spiritually. Yin Yoga is the same. On a physical level, the long-held postures create mechanical stresses within the fascial tissues. These stresses are important to regain and maintain the health of these tissues, but as in anything in life, you can do too much. If there is any pain arising from the practice or when you come out of the postures, you may have gone too deep or stayed too long. Modify the practice so these sensations do not arise. Seek balance: not too much, but not too little either. Go for the Goldilocks' position where it is just right.

Physically, our intention in Yin Yoga is to create a reasonable amount of stress in the fascial tissues and let these stresses linger. Notice, the intention is not to go to end range of motion, although that may happen and if it is pain free, that is okay. On a psycho-emotional level, our intention can be to practice presence, to attend to the sensations arising, or to monitor the breath or to watch the flow of energy within.

What I have described is the style of Yin Yoga that I learned from Sarah Powers and Paul Grilley; however, there are other practices that also go by the name of Yin Yoga. The history behind some of these practices and their naming, and the differences between them and what I call Yin Yoga, can be found in these pages:

Who owns Yin Yoga?
Yin Yoga or Restorative Yoga
The history of yin postures in Hatha Yoga

Now that you know what I mean by the term Yin Yoga, you are ready to look at some concerns and my comments on them.

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You shouldn't stretch ligaments, tendons, joints, connective tissue or fascia

An example of this concern is

> *It does not make sense to try to stretch ligaments! It is an unscientific, unsound, and bad idea. Muscles can stretch 200% but ligaments only 10%. Beyond 10% they are damaged.*

You can replace the word "ligament" with the fascial tissue of your choice: "joint," "tendon," etc. A more complete response to this type of concern can be found in the article on Yoga International called "It's okay to stretch your ligaments." Below is a brief summary of some of the key points (the full article has footnotes with references to the source of the statistics cited):

> Not only do our ligaments, tendons and fascia stretch, they are supposed to stretch. They are naturally elastic: more so than our muscles! Elasticity is not how stretchy something is but rather it is "the ability of a body to resist a distorting influence and to return to its original size and shape when that influence or force is removed." Think of a spring: you can stretch it, which takes energy, but when you let go that energy returns as the spring shortens again. Stiffer springs are more elastic but less stretchy that weaker (more compliant) springs. Our ligaments are like stiff springs; our muscles are much more compliant. In fact, our muscles do not "snap back" after being stretched but have to engage to become shorter again. In this way, our muscles are not elastic at all, just stretchable like plasticine. Our ligaments, tendons, joint

capsules, etc. are elastic and springy. It takes no energy for a ligament to return to its original length, but rather it returns energy to the body. This is exactly how springs work.

Humans are the running, jumping and bouncing primates: our hamstrings are more like ham*springs*! Our fascia is different from that of our simian cousins —we bounce. Our Achilles tendon, for example, evolved to be longer, stiffer and springier than in other apes. It can stretch; and when that stress is released, the Achilles tendon snaps back like a tight spring, helping us to run and jump. Said another way, the highly elastic nature of many fascial tissues like tendons and ligaments allows us to walk, run, jump, and even throw with great facility and energy efficiency. This would not be possible if our ligaments and tendons were not able to stretch.

Human fascia has evolved to stretch and elastically recoil. How much a tendon or ligament can stretch before being damaged is quite variable: it depends upon where it is, and whom we are examining. One common statistic that is often cited is that a tendon can only stretch 8%~10% before becoming damaged. However, that statistic is an average derived from studies of very small numbers of people. Athletes' Achilles tendons can elongate anywhere from a low of 6% (in some runners) to a high of 19% (in some swimmers). Even in a non-athletic population the range of Achilles tendon elongation varies from 5% to 13%. Some ligaments are superstars at stretching! The ligamentum flavum along the spine can stretch 80% without damage! Recently, even the very stiff iliotibial band has been found to be elastic: it stretches about 1~3 cm when running. It acts like a very stiff spring that helps to bring the back leg forward when we walk or run. All this just proves that fascial tissues, including our ligaments and tendons do, indeed, stretch. This is normal, healthy and necessary.

If we avoid stressing tissues, we invite atrophy—a slow steady decay of the tissue's abilities. This happens to any tissue we avoid exercising including our fascia. Laurence Dahners, Professor (Emeritus) of Orthopaedic Surgery, noted, "A common clinical finding is that unloaded ligaments not only atrophy, but also undergo contracture."[1] In other words, if we are not stressing our ligaments, our joints tighten up and we lose range of motion.

Beyond the points made in the above article are the thoughts of a well-known and respected physical therapist and teacher, Greg Lehman. It is Greg's considered opinion that stressing fascial tissues like ligaments and joints can only make them thicker and stronger. Through the process of adaptation, the tissues we stress become stronger, so directly targeting the ligaments will not "over-stretch" them, which seems to be the fear, but will rather thicken them and make them less likely to over-stretch. Here is a quote from Greg:

> Don't you find it odd that [those who criticize stretching ligaments are] pretty adamant that you can't change muscle length with stretching but the same stretching will increase the length of a ligament? We actually have no evidence that a ligament gets longer with stretching. We see the same thing with long term stretching and tendons. And tendons are similar to ligaments in how they respond to load. … When you look at tendon and ligament biomechanics research we see that ligaments are incredibly slow to adapt. And that tensile load, if anything, makes them stiffer and stronger. There is no other load that you can put on ligament. If you pull it/tension it, it responds by getting stronger. (Check these studies here, here and here.)[2]

In short: Our fascial tissues are designed to both restrain too much movement but also facilitate movement. They are elastic: they build up internal tension when stretched and can release that energy back into strong, quick movements in the opposite direction. These fascial tissues include our tendons and ligaments,[3] which are in series with our muscles, as well as the layers of fascia parallel to our muscles, surrounding and investing them. Even one of the strongest, stiffest pieces of fascia in our body, the iliotibial band, is elastic. Like other fascia, it is designed to stretch and that is a good thing.

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[1] Laurence Dahners, *Laury Dahners' Orthopedic Page* (accessed January 10, 2020). https://laury.dahners.com/assets/documents/orthopedic/KD%20paper%20for%20web%202020.pdf

[2] Greg Lehman, "If you want to stretch your hamstrings please continue to do so." *Reconciling Biomechanics with Pain Science* (2012).

[3] The fact that ligaments are in series with the muscles is a newer realization. Most textbooks still show the ligaments being in parallel to the muscles; however, the work of Jaap van der Wal sheds new light on this old model. See Jaap van der Wal, "The architecture of the connective tissue in the musculoskeletal system," *International Journal of Therapeutic Massage and Bodywork* 2.4 (2009): 9–23.

You shouldn't stretch joints

This concern generally takes the form

> *Stressing of joints is dangerous because the joints can be taken too far and become hyperextended. The only way to prevent damage to a joint is to make sure that the muscles surrounding the joint are engaged so that they take the stress, not the joint. Do not relax your muscles when you are stressing a joint!*

Rather than create fear and say that "stressing of joints is dangerous," it is far better to say, "stressing of a joint *could* be dangerous, but it is not always dangerous, and most of the time it is required for the joint to be healthy."

All tissues require stress to regain and maintain optimal health (see the article on Antifragility), and this includes our joints. They need stress, which can also be called load, or exercise. Part of the fear surrounding exercising joints is confusion over the two types of exercises we use to stress tissues: exercises can be either dynamic and active, or passive and static. If we apply an active, dynamic stress to our joints, there is a possibility of destabilizing the joint capsule, in the same way that bending a credit card back and forth repeatedly weakens the plastic. When subjected to this type of stress, it makes sense to co-contract the muscles around a joint, which is protective. However, Yin Yoga does not employ dynamic stress; it employs passive, static, long-held stresses, and this type of stress has been found to be therapeutic for joints.

Yin Yoga for healthy joints

"Use it or lose it." This common saying speaks to what happens when you don't stress your joints. When a healthy joint is deprived of stress, it undergoes contracture. Contracture results in a loss of mobility. There are many causes of contracture: illness, nerve damage, muscle atrophy, or problems with the joint's cartilage or ligaments. Laurence Dahners of the University of North Carolina lead a team investigating this question and discovered a mechanism whereby the body shrink-wraps our joints when they are not stressed. He noted, "A common clinical finding is that unloaded ligaments not only atrophy, but also undergo contracture."[1]

An example of shrink-wrapping contracture is the classic frozen shoulder syndrome. For example: Grandma falls and breaks her arm, the bone is reset, and the arm rests in a sling for several weeks. When the time comes, the sling is removed and the bone has healed, but grandma's shoulder is frozen. What happened? While there are multiple causes of frozen shoulder syndrome, this cause was the lack of use of the shoulder joint. The body took away materials no longer needed or used, contracting the joint and shrinking the joint capsule. When the time came to use the shoulder again, it couldn't respond.

Professor Dahners's studies have shown that joints need stress to be healthy. But, what kind of stress is best? To answer that, we can turn to studies of how damaged joints heal through stress.

Yin Yoga for damaged joints

Passive, long-held, non-maximal stresses have been found to enhance damaged joints' lost range of motion with minimal or no tissue damage. The type of stress employed in these therapies is identical to the quality and quantity of stress applied in Yin Yoga.

One study of contracture repair concluded that "the clinician's ideal treatment program for a patient with passive joint limitation should be mild stretching [of the joint], as much as is practical throughout the 24-hour day, 7 days a week, and to start this program as soon as joint motion is allowed."[2] This study showed that it is not only safe to stress or exercise our joints, it is required, and that the stress should be passive. The study contrasted short, intense stresses like we find in a yang yoga practice with long-held, mild stresses like we find in a Yin Yoga practice. The researchers concluded "the longest period of low force stretch produces the greatest amount of permanent elongation, with the least amount of trauma and structural weakening of the connective tissues. Consequently, permanent elongation of connective tissue results in range of motion increases for the patient." The shorter, more intense stresses were observed to have resulted in "a higher proportion of elastic response, less remodeling, and greater trauma and weakening of the tissue."[3]

In other words, longer holds of less intense force work better for regaining lost range of motion within a joint with the least amount of tissue trauma, and that is our prescription for Yin Yoga practice.

Yin-like therapy for the joints are beneficial

One final therapy for joints is worth noting. It is called static progressive stretch, or SPS for short.[4] SPS is one of a group of therapeutic interventions used to help patients regain lost joint range of motion while decreasing pain, stiffness and swelling. It is used with patients who have undergone surgery or trauma that required immobilization of a joint. The immobilization may have been necessary to protect the joint from excessive stress during the initial healing phase, but immobilization can lead to significant complications and pathologies, including contracture of the joint as just observed.

To recover lost range of motion, the first option is to use physical therapy to passively stretch the joint with progressively greater loads of force to take the joint beyond its limited range of motion. (We can consider this therapy to be a form of Yin Yoga being done *on* the client rather than *by* the client.) However, physical therapy is limited in the number and duration of sessions. You can only visit your therapist so many times a week, and certainly not 3 or 4 times every day. Thus stretching devices may be considered as an adjunct to, or in place of, physical therapy.

There are several possible devices that can be used, but of interest is static progress stretch (SPS), which is like Yin Yoga being done *by* the client on herself.[5] With these devices the joint is taken to its tolerable limit of movement for a period of time. Once the sensation ebbs, the patient then is free to increase the stress, taking the joint to a new edge, and again hold there. Through this progressive approach, at each setting the joint is subjected to a constant level of stretch, and as the joint is held at this position, the stress level within the tissues lessens. Thus we have the name *static progressive stretch*. These devices have been used for restrictions in mobility of ankles, knees, shoulders, elbows and wrists.

There are interesting correlations to Yin Yoga in the way SPS devices are used:

- The stress is static and passive, which is the same in Yin Yoga: we don't continually move and the muscles are not used to create the stress.
- A tolerable depth is obtained.
- The duration of the stress is on the order of 30 minutes. In a Yin Yoga class, we do not hold any one particular posture that long, but throughout the whole class, the cumulative time spent stressing a particular joint could be 15~30 minutes.
- If the sensations decrease, the *patient* decides to go deeper and adjusts the device to allow more range of movement; in the same way, in Yin Yoga the student controls the depth in a pose. If the sensations ebb away (the edge "moves") then the student allows herself to go deeper.

In short: All tissues need stress to be healthy and our joints are no exception. However, the best way to stress yin-like tissues, such as our joint capsules and ligaments, is with a yin-like stress: a long-held, passive, non-maximum stress. Several therapies employ exactly this kind of stress to heal damaged joints. It is possible to go too far and over-exercise joints, or any tissues, but this must not be confused with never stressing them. Unstressed joints lead to contracture and atrophy. Joints need stress and yin stresses have been proven to be healthy and protective. It is okay to do Yin Yoga on your joints, as long as you practice with intention and attention.

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[1] Laurence Dahners, "On Changes in Length of Dense Collagenous Tissues: Growth and Contracture," *Laury Dahners' Orthopedic Page* (accessed January 10, 2020). https://laury.dahners.com/assets/documents/orthopedic/KD%20paper%20for%20web%202020.pdf

[2] George R. Hepburn, "Case Studies: Contracture and Stiff Joint Management with Dynasplint," *Journal of Orthopaedic and Sports Physical Therapy* 8.10 (April 1987): 498–504. doi:10.2519/ jospt.1987.8.10.498.

[3] Ibid.

[4] For more details on SPS, see my article Static Progressive Stress and Yin Yoga.

[5] Other devices include serial casting, static braces, or dynamic splints that provide low-load, prolonged stretch. Dynamic splints use spring loading or elastic bands to provide low-intensity tension (less than that exerted by a physical therapist) and are designed to be worn over relatively long periods (for example, 6 to 8 hours at a time or overnight). With these devices the angle of the joint may slowly change over time. With an SPS orthosis, the angle of the joint remains constant until the patient resets it, and the device is generally only worn for up to 30 minutes at one time.

To protect joints, we must engage muscles, not relax them

This concern can take the form of

> *To protect our joints, we must engage the muscles. Otherwise, the stress from the posture will overload the joint and cause damage. However, in Yin Yoga students are advised to relax their muscles and allow the stress to directly hit their joints, which is unhealthy and unwise.*

It is true that in Yin Yoga we mostly do the practice with the muscles relaxed. There are a couple of reasons for this.

1) Engaging the muscles for long periods of time is not the best way to exercise muscles. Muscles do better with cyclical stress and dynamic movements. If a muscle remains contracted for several minutes, blood flow is restricted and the muscle can begin to starve. (There are medical conditions that involve involuntary contraction of muscles called tetany or contracture, and these are not healthy for the muscles.) In a Yin Yoga practice, where the student may remain in a posture for several minutes, it is recommended that the muscles be relaxed.
2) Another reason for relaxing the muscles is to allow the stress generated by the posture to soak into the deeper connective tissues. When the muscles are tight or engaged, there is less stress available for the parallel tissues, which typically are the joints capsules. If we are deliberately targeting the joints, then relaxing the muscles is more effective.[1]

There is benefit to stressing the joints! All tissues need stress to be healthy. (See the response to the concern, You shouldn't stretch joints.) Engaging the muscles will decrease the stress on your joints, but this may actually be counter-productive, depending on the intention of your practice.

There are two ways you can work with joints:

1) When a joint is under a lot of load, the joint should brought to a neutral position and stiffened through co-contraction of the muscles around the joint.
2) To enhance the range of motion of a joint, the load should be reduced and then the joint can be moved to its end range of motion.

There is a time to engage the muscles to protect a joint: when it is bearing a significant stress that could damage the joint. This is what is wisely recommended in our active yoga practices: the joints are bearing larger than normal loads due to the weight of the body, so the muscles should be co-contracted to stiffen the joints, which helps them bear the extra stress. However, if the joint is not bearing a large load, it is safe to take the joint to its natural end range of motion (but don't go past that point!). In the practice of Yin Yoga, the joints are not load-bearing and thus it is okay to relax the muscles. Relaxing the muscles will allow the joint to open to its full, natural range of motion. Engaging the muscles prevents the joints from opening fully.

A final point: regardless of all the above, if going to your edge with muscles relaxed causes discomfort or pain, it is not a good idea for you. Forget the theory. If, in your practice and in your experience, completely relaxing the muscles is not good for you, then keep a slight muscular engagement or skip that posture. Play with how much muscular engagement you need and how long you can stay in a pose: experiment, test it out and create an approach that works for your body.

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[1] Paradoxically, when the muscles are engaged or tight, more stress passes into the serially aligned tissues such as the tendons and ligaments. In other words, engaging muscles actually increases stress on the tendons and ligaments because they are in series with the muscles! And that may be perfectly okay. But, again, we don't want to actively contract the muscles for several minutes, so even if we want this extra stress on the ligaments, it is better to relax the muscles. It is rather ironic that the yoga teachers who suggest engaging muscles to protect joints are actually recommending a practice that will increase stress on the ligaments! Tightening the muscles will decrease stress on parallel tissues, like the joint capsule, but will increase stress on the tissues in series, such as the tendons and ligaments. See the article Cold Muscles or Warm Muscles for more on why this is so.

Passive stretching is not safe

A couple of versions of this concern are

- *"I am not a strong advocate for passive stretching."*
- *"Passively holding the body in a stretched position without muscular engagement is dangerous."*

While the implication that passively stretching is unusual or abnormal behavior, it is actually something we do all the time! Consider how long you sit each day or the long periods of time you may be standing, perhaps in a line-up somewhere. These positions involve long-held, static, passive stresses and stretches and yet we are not being harmed or crippled by these loads.

When we sit, our hips are flexed and the lumbar spine is almost always flexed close to its maximum. And we may stay in this position for 20 minutes, 30 minutes, an hour or even longer while we are driving, sitting in front of a computer or watching TV. In this position our fascial tissues are under a constant passive stress and are in a stretched position. But there is no harm occurring to these tissues.

Consider meditators: they remain sitting, usually with crossed-legs, for 20~45 minutes at a time. Their hips are flexed, their legs abducted and externally rotated in the hip socket. Again, there is a long-held, passive stretch occurring around these areas, but meditators are not crippled or injured due to this passive stress.

(Certainly, there are other problems that can arise from standing or sitting for long periods of time: creep can set into the fascial tissues making them a bit weaker for a while after the session ends; sitting too long can take a physiological toll on cardiovascular health if it is not balanced with some form of movement exercise, etc. These problems are not related to the passive stresses on the muscles of fascia per se; the problems are due to extended immobility of the body as a whole.)

Compare how long we remain in these passive positions during each day of our lives to how long we typically remain in a Yin Yoga posture: hours versus 5 minutes. If passively stretching our legs, hips and backs for hours while standing or sitting is not damaging us, how can 5 minutes in Butterfly Pose or any other Yin Yoga posture be harmful? From your own lived experience, you know that this concern doesn't make sense.

There is another implication raised by this concern: there is a fear that if we do not actively engage the muscles when in a passive posture, too much stress will accumulate in the connective tissues. Thus, the recommendation is to actively engage the muscles to prevent stress in the ligaments and tendons. The reality, however, is that engaging the muscles *increases* the tension in the ligaments and tendons!

Tendons and ligaments are in series with muscles.[1] If you have two materials connected in series and then stretch the group, the more compliant (stretchier) part will elongate more than the stiffer portion. (This is intuitively obvious, but if you need visual proof, check out the article Cold Muscles or Warm Muscles.) In the same way, if you have warmed up or relaxed muscles connected in series to ligaments or tendons, and then stretch the group, the relaxed or warmed muscles will elongate more than the tendons. However, if you engage and tighten the muscles, they become less stretchy than when they are relaxed (they are now stiffer), thus they will stretch less, which means the ligaments will stretch more.

Actively engaging muscles will actually increase the stress on the ligaments and tendons. If the concern about Yin Yoga is based on Yin Yoga putting too much stress on ligaments when the muscles are passive, and therefore we should actively engage muscles, well, it turns out the opposite is true. Engaging the muscles increases stress on the ligaments!

Now, one final point—it is okay to stress ligaments! Despite the concerns raised by the folks offering this criticism, stressing and stretching our fascial tissues is essential to maintaining their health. For a further discussion on this topic, see the response to the concern You shouldn't stretch ligaments, tendons, joints, connective tissue or fascia.

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[1] The fact that ligaments are in series with the muscles is a newer realization. Most textbooks still show the ligaments being in parallel to the muscles; however, the work of Jaap van der Wal sheds new light on this old model. See Jaap van der Wal, "The architecture of the connective tissue in the musculoskeletal system," *International Journal of Therapeutic Massage and Bodywork* 2.4 (2009): 9–23.

You shouldn't stretch nerves

This particular concern of Yin Yoga goes something like this

> *Yin Yoga is bad for the nerves. You should not stretch nerves! Being stretched can easily damage nerves.*

All forms of yoga can potentially stretch a nerve, not just Yin Yoga, but a stretched nerve is not necessarily dangerous. It *could* be dangerous, but it could also be therapeutic. It depends on the condition of the nerve, which nerve, where it is, its surrounding environment, the magnitude of the stretch, the duration of the stretch and how much recovery time is allowed after stretching. Healthy nerves love stress —the stress helps to move the nerve, which brings nutrients to it. However, if the nerve is "stuck," perhaps due to some scar tissue or impingement, then a stress applied to the nerve may result in too much stretch occurring, which may not be great for that nerve. This applies for any kind of yoga!

One perspective offered in the journal *Physical Therapy* suggested that therapists "with an understanding of the adaptive responses of nerves to specific physical stresses will be better prepared to provide reasoned interventions to modify specific aspects of the stresses."[1] The authors cite research on the effect of both tension (including long-held stretching) and compression of nerves. They write that there are 5 levels of stress that can affect nerves, some for ill and some for good:

1) Levels of physical stress lower than the levels required for tissue maintenance (low stress) result in a reduced ability of the tissue to tolerate subsequent stress and are consistent with tissue plasticity and response to functional demand. [So, no stress = no good!]

2) Levels of physical stress in the range required for tissue maintenance (normal stress) result in no tissue adaptations and are considered to maintain a state of equilibrium.

3) Physical stress levels that exceed the range required for tissue maintenance (high stress) result in an increase in the tolerance of the tissue for stress in an effort to meet the mechanical demand.

4) Physical stress levels that exceed the capacity of some components of the tissue (excessive stress) result in tissue injury.

5) Levels of physical stress that are extreme (extreme stress) result in tissue death.

It is possible to be at levels 4 or 5, which is too much for the nerves, but this does not mean we want no stress at all, as in level 1. Even a little stress (level 2) may serve to maintain current nerve health. To help the nerves regain optimal health, we need enough stress (level 3) to challenge them! That is where we aim to be in Yin Yoga. The stress is long-held, but moderate. We do not try to hold at the maximum extensions possible

In short: Too much stress is not good for our nerves, but too little stress is not good either. A moderate amount of stress can help our nerves move. Healthy nerves glide and slide in the connective tissue beds surrounding them. This movement is normal and healthy for the nerves. Stressing the nerve, whether through an active yoga practice or through Yin Yoga, is good for normal nerves. However, sometimes the nerves get stuck, and when this happens, they no longer slide, but stretch when under tension. Most nerves can tolerate some stretch, but if too much stretching occurs, the nerve fiber can become damaged. In these situations, a yoga practice that places too much stress on that stuck nerve can cause problems. A yoga therapist may be able to work with the student to re-mobilize the nerve and allow it to slide once more.

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[1] K.S. Topp and B.S. Boyd, "From Structure and Biomechanics of peripheral nerves – Nerve Responses to Physical Stress and Implication for Physical Therapists," *Physical Therapy* 86.1 (2006).

Holding stress for a long time is destabilizing

I am not completely sure what this concern is really intending to say, but I suspect it is something along the lines of

Holding a stress or a stretched position for a long time is damaging to the body.

A big part of the Yin Yoga style of practice is the long-held stresses applied to the tissues. We remain in the postures for 1 to 10 minutes or even longer. So, it is certainly true that we do stress tissues for quite a while in Yin Yoga. However, this is not a bad thing. It *might* be a bad thing, for some people, especially if they ignore warning signs that indicate they are remaining too long in the pose. If a student is getting sensations of pain and ignores these signals, then damage could happen. But long-held stresses are a normal and natural part of life!

Think about how long you sit every day. You certainly sit longer than 5 minutes at a time. Sitting for hours at a time can be unhealthy,[1] but in Yin Yoga we do not remain in any single posture for hours at a time. When you sit for 20 or 30 minutes, stress is created along the spine and in the hips. For the vast majority of people, this is not dangerous. We do it all the time. However, if you go from sitting for a while to a load-bearing posture, like carrying heavy boxes after driving in your car for an hour, you could put too much stress on the weakened connective tissues. For this reason, counterposes are important in yoga; the body needs time to reduce the creep that has set in during the postures.[2]

Think of how often you stand for minutes at a time. Standing places a constant stress on the knees, hips, ankles, feet, etc. Certainly, stressing these areas for 5 to 10 minutes at a time has not damaged you. We do not hold stresses longer in Yin Yoga than you are holding at other times, but in our Yin Yoga practice we are deliberately creating these static stresses in certain targeted areas that may require or desire some added focus. Stressing and resting tissues is how the body adapts and gets stronger. (Scientists even have a term for this: *SAID*, which means *Specific Adaptation to Imposed Demand*. When we impose a load, stress or demand on our tissues, they adapt and become more able to tolerate the demand.)

Holding a stress for a long time can be dangerous if we are too deep in a pose, which means the stress is too strong, or if the tissues are already damaged in some way. Generally, the body will warn us if this is risky by either sending pain signals or creating a level of discomfort that is obviously too much.[3] If you practice with attention, you should be able to notice the pain or discomfort and use your own judgment to modify the pose or come out. It is not a long-held stress that is a problem, but rather a long-held *inappropriate* stress that can be dangerous. When you practice with both intention and attention, these stresses can be healing and helpful.

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[1] There are several studies that have shown extended sitting every day can increase mortality rates, unless they were accompanied by daily exercises or if the sitting was interrupted every 30 minutes with some mild movements. For more information, visit this site at the Mayo Clinic online: https://www.mayoclinic.org/healthy-lifestyle/adult-health/expert-answers/sitting/faq-20058005.

[2] See my article on Creep and Counterposes.

[3] There are students who, unfortunately, are in chronic pain. For these students, hearing a teacher say, “Don’t stay in a pose if you are feeling pain” is unhelpful. For these students, life is painful, and all poses involve some degree of pain and discomfort. In these cases, the intention becomes to notice if the degree and quality of the pain changes for the worse while remaining in the postures. If so, then the pose needs to be modified or abandoned. However, if the normal pain/discomfort does not become worse while remaining in the pose, it may be okay to stay and see how the stress of the pose changes the situation over the days to come. This decision is always up to the discretion of the student.

Holding for time will make the tissues weaker (due to creep) and thus more likely to be damaged

One form of this concern is

> *Long-held stresses create creep in the connective tissues, which makes them longer, weaker and less able to deal with loads or stresses. While in this weakened state, stress can damage the tissue.*

This may be true! But this does not mean making tissues weaker is a bad thing. Making tissues weaker is the whole principle of exercise.[1] Exercise loads the tissues, making them initially weaker. Then, during the refractory (rest) period between bouts of exercise, the body adapts and makes the areas we just used more usable. For example, in weight training we may stress the arm muscles by doing curls with progressively heavier weights until we can barely do one repetition with the highest weight we can manage. This exercise weakens the muscle. We cannot curl as much weight after exercising as we did before the session; we can feel this weakness, and it is a sign that we had a good workout. Then, over the next 24 to 48 hours, we let our muscles rest. At the end of the rest period the muscles are stronger than before.

This happens during our Yin Yoga practice as well, except instead of strengthening the muscles, the stress is applied to the fascia, ligaments, joints, etc. During this stress, these tissues become longer, thinner and weaker. That's okay. During the rest period that follows, the tissues adapt and become stronger. During the stress, the tissues undergo creep, which is the technical term for the elongation that happens to materials when subjected to a constant load. Once the stress has ended, the tissues slowly recover and return to their original length and strength, but until the recovery has finished, the tissues are weaker. It may not be a good idea to subject

your tissues to high levels of load during this initial recovery period. How long this period lasts depends on many factors, such as the individual's biology and state of health, how much stress was applied and for how long, and what countermovements or counterposes were performed. A day or two after the yin exercises, the tissues should have fully recovered and become stronger than before. (Further information on this topic is available in the article Creep and Counterposes.)

This raises the question of whether athletes should stretch before their performance or sport. This issue is addressed in the section, Yin Yoga is not good for athletes. The answer is … maybe not. But, maybe! As in all things, it depends. The key question is to determine what works for you, and that will take some experimentation and attention.

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[1] Scientists even have a term for this: *SAID*, which mean *Specific Adaptation to Imposed Demand*. When we impose a load, stress or demand on our tissues, they adapt and become more able to tolerate the demand.

Yin Yoga involves crunching of the spine and long-held compressions

Many yoga teachers are under the impression that allowing the vertebrae to come into contact with each other is a bad idea. They will generally use negative terms and imagery to describe spinal compression, such as

- *Don't collapse into your lower spine.*
- *Don't crunch your back.*
- *Don't sink into your lumbar.*
- *Don't jam your bones together.*

There are two main problems with these statements: 1) the use of fear and 2) the fear of compression.

1) Each of the above statements use fear as a tool to control the student. Unfortunately, using fear as a teaching tool can create a nocebo effect. (A nocebo is the opposite of a placebo. Nocebos can result in a student experiencing a predicted negative outcome even though the intervention or posture is not harmful.[1]) So, while backbends can and do create compressive stresses along the spine, and while these stresses can be very beneficial for most students, the fear generated by teachers' negative comments can undo the benefits and create the very harm forecasted. Yoga teachers, and anyone offering therapy in general, should take care to not inadvertently use nocebo language. It is far better to teach the student to notice what sensations are actually arising than to predict pain and problems that may never arise.

2) Compression is not bad, per se. Yes, you can overdo it and apply too much compression, or hold compression for too long, but this does not mean we should never compress our tissues. If compression was bad, all massage therapists would be out of work! As long ago as the 1800s, we have known that bones grow thicker and stronger because of the compressive stresses they bear. Without compression, bones grow weaker and more fragile.[2] The same adaptations to compression stress can happen in other tissues, such as tendons and ligaments.[3]

Space agencies know this well. Astronauts in orbit live in a microgravity environment and have no stress on their bones or muscles. Their bodies continue to reabsorb tissues, which is a normal part of health, but no new fibers are created, which is neither normal nor healthy. Studies of cosmonauts and astronauts who spent months on the Russian space station Mir revealed that space travelers lose, on average, 1%–2% of bone mass each month.[4] In some astronauts, the lack of stress has resulted in a much greater loss of bone density—up to 20% over a 6-month stay in space! This loss of bone density generally occurred in the lower body and the lower back. The solution? Stress the lower back! Astronauts spend a considerable part of their day exercising to slow down the atrophy that comes from living in space.

Compression and tension are two of the most common forms of stress applied to our tissues.[5] Whether through massage, exercise or surviving daily living, the body is constantly adapting to stress. Stresses are healthy and necessary. Do not be afraid to stress your body both through tension and compression. Beware of doing too much, of course. But do not, out of fear, avoid all compression.

- For more on the way tension and compression arise in our yoga practice, read What Stops Me?
- For more on how stress is vital to health, read Mechanotransduction: Yin Yoga's Magical Ingredient is Stress.
- For an article describing how Yin Yoga can be specifically useful for low back pain, read Yin Yoga for Low Back Pain.
- For the importance of stress, read Are Yoga Teachers Making Us Fragile?

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[1] For more on nocebos see the article Yoga, Placebos and Nocebos.

[2] See the work of Julius Wolff, a German anatomist in the late 1880s.

[3] See M. Benjamin and J.R. Ralphs, "Fibrocartilage in tendons and ligaments—an adaptation to compressive load," *Journal of Anatomy* 193 (1998): 481–494.

[4] See S.M. Smith et al., "Benefits for Bone from Resistance Exercise and Nutrition in Long-duration Space-flight: Evidence from Biochemistry and Densitometry," *Journal of Bone and Mineral Research* 27.9 (2012): 1896–1906.

[5] We could be more complete and list all the forms of stress that are familiar to engineers and architects (tension, compression, shear, bending and torsion), but the latter 3 forms are variations or combinations of either tension or compression applied in different directions.

Yin Yoga is bad for the muscles

One particular example of this concern came from a physiotherapist who tried to convince a yoga studio owner to drop Yin Yoga from the schedule. The therapist's concern was

> *Holding poses for 5 to 6 minutes is simply not good for the body; in general it places too much strain on the muscles.*

The first point to make here is that Yin Yoga is practiced with the muscles relaxed, not engaged. This means that there is no active strain created in the muscles, although there may be a passive strain. So, let's discuss whether passively stretching muscles for a long time is unhealthy.

Of course, it is possible to do too much of anything, and that includes generating and holding a stress in the muscles that is too large and/or for too long. But this does not mean that all stresses on the muscles are detrimental. It depends on the quantity and time. Plus, in Yin Yoga the student is advised to *relax* the muscles so that the stresses generated in the posture can "soak" into the joints. Contracting muscles tend to tighten joints, shortening them, which prevents the joint from opening and prevents the stress of the posture reaching the joint capsules. Since we are deliberately targeting joint capsules (among other fascial areas), it is a good idea to practice Yin Yoga with muscles relaxed and unstressed. (A deeper explanation of why tightened or cold muscles experience more stress than warm or relaxed muscles is offered in the article Warm Muscles, Cold Muscles.)

Paul Grilley offered another explanation for why we perform Yin Yoga with relaxed muscles in a Yoga Journal article:

> [While doing Yin Yoga]… the overlying muscles must be relaxed. If the muscles are tense, the connective tissue won't receive the proper stress. You can demonstrate this by gently pulling on your right middle finger, first with

> your right hand tensed and then with the hand relaxed. When the hand is relaxed, you will feel a stretch in the joint where the finger joins the palm; the connective tissue that knits the bones together is stretching. When the hand is tensed, there will be little or no movement across this joint, but you will feel the muscles straining against the pull.
>
> It's not necessary—or even possible—for all the muscles to be relaxed when you're doing some Yin Yoga postures. In a seated forward bend, for example, you can gently pull with your arms to increase the stretch on the connective tissues of your spine. But in order for these connective tissues to be affected, you must relax the muscles around the spine itself. Because Yin Yoga requires that the muscles be relaxed around the connective tissue you want to stretch, not all yoga poses can be done effectively—or safely—as yin poses.
>
> Standing poses, arm balances, and inversions—poses that require muscular action to protect the structural integrity of the body—can't be done as yin poses. Also, although many yin poses are based on classic yoga asanas, the emphasis on releasing muscles rather than on contracting them means that the shape of poses and the techniques employed in them may be slightly different than you're accustomed to.[1]

Thomas Myers, anatomist and author of *Anatomy Trains*, has stated that sustained stretches are required to allow muscles to relax so that the fascia starts to stretch and release.

> …generally, the sustained stretches of yoga where you hold a posture for several minutes (as you do in many yoga styles) give the muscles a chance to calm down. The muscles have to relax first, and then the fascia starts to stretch and release. And that can facilitate the kind of repatterning that leads to lasting release of chronic holdings and, in many cases, a profound change of mind and body.[2]

It is okay to allow a stress to last for several minutes even though the stress may be felt in the muscles. The idea is to keep the muscles relaxed as much as possible during this period.

However, there sometimes arises an opposite concern,

> *Passively holding in a stretched position without muscular engagement is not a good idea. Muscles should be engaged to protect joints and ligaments.*

In this case we have the opposite concern, not that muscles will be overstressed by holding for too long during a Yin Yoga practice, but that muscles will not take the stress off the deeper tissues, which could destabilize the connective tissues. This has already been addressed in the concern To protect joints, we must engage muscles, not relax them.

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[1] Paul Grilley, "Why Try Yin Yoga?," *Yoga Journal* (August 2007; updated April 2017).

[2] Eva Norlyk Smith, "Creating Change: Tom Myers on Yoga, Fascia and Mind-Body Transformation," *HuffPost* (December 2013; updated February 2014).

Yin Yoga will not trigger the parasympathetic nervous system

This concern is a subset of a generalized criticism of Yin Yoga in particular but could be leveled at all yoga practices:

> *There is no scientific proof that yoga practice affects our nervous system.*

While it is true that there is little scientific research done specifically on Yin Yoga, there is some. One Swedish group looked at the relationship between Yin Yoga, mindfulness and stress and worry. They called their program YOMI:

> The YOMI program is a psychoeducational training and physical practice-based program that bridges knowledge from evidence-based psychotherapy with the practice of mindfulness and yin yoga.[1]

The *parasympathetic nervous system* (PNS) is called our "rest and digest" or "feed and breed" system. It is the complement to the *sympathetic nervous system* (SNS), which has been called the "fight or flight" system. These are both components of the *autonomic nervous system* (ANS), which implies that these effects are normally beyond conscious control. They happen automatically, depending on mind states, and affect our internal organs, heart rate, respiration, blood pressure, etc. We need both systems operating at various times, but in the modern era, we seem to be in the aroused, sympathetic state far more often than in the relaxed, parasympathetic state, with many notable negative health consequences.

Trainings that can help us activate the PNS at will are valuable. We know that slow breathing can trigger the PNS and this can be added to any yoga practice, including Yin Yoga.[2] The YOMI studies have also shown directly that Yin Yoga can trigger the PNS and provide many health benefits. From a 2019 study of anxiety (which can trigger the SNS or be triggered by the SNS), the authors came to this conclusion:

> …there was a significant reduction found in state anxiety and trait anxiety after the yin yoga, with no changes in trait mindfulness. The results indicate that yin yoga has an anxiolytic effect, although the uneven number of participants made comparison difficult. Yin yoga should be considered as a potential treatment option for anxiety.[3]

The earlier 2017 study found

> [Yin] yoga stimulates the parasympathetic nervous system, which slows down breathing, heart rate and relaxes the body...[4]

(For more details on the YOMI findings and to read the lead author (Frida Hylander) directly, visit the YOMI website.)

The YOMI findings and many students' personal experiences are pretty clear: Yin Yoga, especially when combined with relaxed, slow breathing, triggers the parasympathetic nervous system. Not for everyone, of course. Nothing works for every body, but for many people the benefits are obvious and real.

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[1] Frida Hylander, Maria Johansson, Daiva Daukantaitė and Kai Ruggeri, "Yin yoga and mindfulness: a five week randomized controlled study evaluating the effects of the YOMI program on stress and worry," *Anxiety, Stress & Coping* 30.4 (2017): 365–378.

[2] See the article The Yinside of Breathing.

[3] Denise Winroth, Peter Hassmen and Christopher J Stevens, "Acute Effects of Yin Yoga and Aerobic Exercise on Anxiety," *Alternative & Integrative Medicine* 8.2 (2019): 278.

[4] Hylander et al., "Yin yoga and mindfulness."

Yin will trigger traumatic memories

It is certainly true that yoga, or even meditation, can trigger unwelcomed states of mind in some people.[1] But, fortunately, these instances are relatively rare. On the other hand, Yin Yoga has been used quite effectively to help people deal with traumatic memories.

Two particular teachers, Tristan Rose and Ross Walker, have made it their personal mission to introduce Yin Yoga to veterans to help them deal with post-traumatic stress disorders (PTSD). They report that

> …the slow pace of yin yoga is particularly accessible to the veteran and emergency service community who have 'suffered trauma and hold injuries from their service.'[2]

Their evidence is not just anecdotal, although they do have a lot of examples. They also draw from professionals in the field, such as Professor David Forbes of the Phoenix Australia Centre for Posttraumatic Mental Health, who said,

> Yoga, mindfulness, meditation and exercise are really important for lowering the levels of arousal we see in [post-traumatic stress disorder] … that sense of ongoing readiness to respond to threat that taxes the body.[3]

So, while rarely some people can be triggered by meditation or yoga, many more seem to benefit from the practice.

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[1] "Not all effects of the practice of meditation are beneficial. Shapiro (1992) found that 62.9% of the subjects in a Vipassana retreat reported adverse effects during and after meditation and 7.4% experienced profoundly adverse effects. The length of practice (from 16 to 105 months) did not make any difference to the quality and frequency of adverse effects. These adverse effects were relaxation-induced anxiety and panic; paradoxical increases in tension; less motivation in life; boredom; pain; impaired reality testing; confusion and disorientation; feeling 'spaced out'; depression; increased negativity; being more judgmental; and, ironically, feeling addicted to meditation. Other adverse effects described (Craven, 1989) are uncomfortable kinesthetic sensations, mild dissociation, feelings of guilt and, via anxiety-provoking phenomena, psychosis-like symptoms, grandiosity, elation, destructive behaviour and suicidal feelings. Kutz et al. (1985a,b) described feelings of defenselessness, which in turn produce unpleasant affective experiences, such as fear, anger, apprehension and despair." Alberto Perez-De-Abeniz and Jeremy Holmes, "Meditation: Concepts, Effects and Uses in Therapy," *International Journal of Psychotherapy* 5.1 (2000): 49.

[2] Jennifer Scherer, "How a Melbourne yoga studio is helping heal veterans and emergency service workers," *SBS News* (September 14, 2019).

[3] Ibid.

I know someone who was hurt doing Yin Yoga

This concern can take the form of

> *I know of a student doing Yin Yoga who hurt herself while she was coming out of a posture and she had pain for weeks afterwards*.

Any injury occurring in a yoga class is regrettable and unfortunate. However, injuries can happen in all walks of life and during any physical activity. Crossing a street is dangerous, but this does not mean we should never cross a road. It does mean that we have to be attentive when doing so. One of the best gifts a yoga teacher can provide her students is training in the ability to recognize when signals are present (i.e., pain!) indicating that an injury may be on the way, and to wisely choose to come out of the pose before the injury occurs.

The number of injuries occurring in yoga classes has been rising all over world.[1] However, also increasing is the sheer number of students practicing yoga. What is important is the *rate* of injuries occurring during a yoga class versus other forms of physical exercise or therapy. Unfortunately, here too the numbers seem to point to injury rates in yoga classes that match or exceed those in sports. A report on a 2017 study[2] found

> … the incidence of pain caused by yoga is more than 10 per cent per year, which is comparable to the injury rate of all sports injuries combined among the physically active population. However people consider it to be a very safe

> activity. This injury rate is up to 10 times higher than has previously been reported.
>
> We also found that yoga can exacerbate existing pain, with 21 per cent of existing injuries made worse by doing yoga, particularly pre-existing musculoskeletal pain in the upper limbs.
>
> In terms of severity, more than one-third of cases of pain caused by yoga were serious enough to prevent yoga participation and lasted more than 3 months.
>
> The study found that most "new" yoga pain was in the upper extremities (shoulder, elbow, wrist, hand) possibly due to downward dog and similar postures that put weight on the upper limbs.[3]

That all sounds very bad, but they also reported,

> …74 per cent of participants in the study reported that existing pain was improved by yoga, highlighting the complex relationship between musculoskeletal pain and yoga practice.[4]

Unfortunately, the authors did not distinguish between various styles of yoga. From their mention of downward dog, they are probably not referring to restorative yoga or Yin Yoga, as these styles do not incorporate weight bearing postures. It seems logical to assume that the more vigorous and active practices create more injuries than the more passive styles.

It is curious to review the findings of the 2016 American study cited earlier that showed where the most common injuries occurred and to whom:

> The trunk (46.6%) was the most frequent region injured, and sprain/strain (45.0%) accounted for the majority of diagnoses. The injury rate increased overall from 2001 to 2014, and it was greatest for those aged 65 years and older (57.9/100,000) compared with those aged 18 to 44 years (11.9/100,000) and 45 to 64 years (17.7/100,000) in 2014.[5]

This would indicate that the older the student, the more care should be taken. These authors concluded,

> Participants aged 65 years and older have a greater rate of injury from practicing yoga when compared with other age groups ... While there are many health benefits to practicing yoga, participants and those wishing to become participants should confer with a physician prior to engaging in physical activity and practice only under the guidance of certified instructors.[6]

This conclusion is similar to the one reached by the authors of the 2017 study,

> Pain caused by yoga might be prevented by careful performance and participants telling their yoga teachers of injuries they may have prior to participation, as well as informing their healthcare professionals about their yoga practice. We recommend that yoga teachers also discuss with their students the risks for injury if not practiced conscientiously, and the potential for yoga to exacerbate some injuries.[7]

Sage advice: yoga teachers should not be over-promising the benefits of the practice and should be training students to be attentive to the warning signs that they may be going too far. This applies to Yin Yoga, for sure, but to all styles of yoga as well.

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[1] A 2016 study in the United States found an increase in the rate of injuries of yoga practitioners between 2001 and 2014. There were 29,590 yoga-related injuries seen in hospital emergency departments from 2001 to 2014. (See Thomas A. Swain and Gerald McGwin, "Yoga-Related Injuries in the United States From 2001 to 2014," *The Orthopaedic Journal of Sports Medicine* (2016).) A more recent, 2020 Australian study found "There were 118 yoga-related injury cases that significantly ($p < .05$) increased by 357% from July 2009 to June 2016. Most of the cases were female (n = 96; 81.4%) and between 20 and 39 years old (n = 68, 57.6%). Most common injuries comprised dislocations/sprains/strains (n = 60, 51.7%) followed by fractures (n = 17, 14.4%), and injury to muscle/tendon (n = 15, 12.7%)." B. Sekendiz, "An Epidemiological Analysis of Yoga-Related Injury Presentations to Emergency Departments in Australia," *The Physician and Sportsmedicine* (January 17, 2020).

[2] See Marc Campo, Mariya P. Shiyko, Mary Beth Kean, Lynne Roberts and Evangelos Pappas, "Musculoskeletal pain associated with recreational yoga participation: A prospective cohort study with 1-year follow-up," *Journal of Bodywork and Movement Therapies* 22.2 (April 2018): 418–423.

[3] University of Sydney, "Yoga might be more risky for causing musculoskeletal pain than you think," *Science Daily* (June 27, 2017).

[4] Ibid.

[5] Swain et al., "Yoga-Related Injuries in the United States From 2001 to 2014."

[6] University of Sydney, "Yoga might be more risky for causing musculoskeletal pain than you think."

[7] Marc Campo et al., "Musculoskeletal pain associated with recreational yoga participation: A prospective cohort study with 1-year follow-up."

Yin Yoga is not good for pregnant women

The premise behind this concern can be stated as follows:

> Pregnant women have a lot of the hormone *relaxin* in their bodies, which softens their collagen, making them potentially hypermobile and subject to injuries due to this hypermobility. The long-held stresses of Yin Yoga are not good for them.

There is some truth to this statement: women do produce a lot of the relaxin hormone during the first trimester of pregnancy, which helps to soften their connective tissue (to allow for easier implantation of the fetus into the uterine wall and for opening space in the pelvic bowl), and then again in the days prior to labor beginning. However, this does not mean that a Yin Yoga practice cannot be healthy during these months.

Intentions are important. While pregnant, the intention in a woman's practice should not be to go further into poses than she has ever gone before. Range of motion is not the goal now; the baby's health and the woman's own comfort is key. Because the connective tissues will start to become softer, it may be easy to overstress the ligaments and cartilage and possibly stretch and damage them. Whatever range of motion she had before becoming pregnant, she should be happy to stick with that—no need to try to go further.

Fortunately, the longer the pregnancy lasts, the less the mother-to-be is able to move. Her growing belly will prevent many movements. Twists do not have to be forbidden because they will naturally become shallower. Movements in the pelvis and hips, however, should be dialed back. Too much stress here, held for too long, could potential destabilize some women's sacroiliac joints or the pubic symphysis. A general rule of thumb for pregnant students is to avoid longer holds or deep positions. Three minutes may be the maximum now.

(A similar point can be made for women who are post partum: after pregnancy is finished, it is not yet time to try to obtain greater range of motion. The body is very open now. Yin Yoga is not recommend in the first few weeks right after delivering a baby. This is a time to allow the body to knit back together. Perhaps after 6 to 8 weeks, a gentle yin-practice can begin again. Gentleness is the key. When the time is right, some yin postures can be used to gently stretch the body, as well as massage the belly and stimulate abdominal muscles in a gentle way.)

Another piece of advice: pregnant women in the 3rd trimester may want to avoid lying on their back for long periods of time. Recent evidence has shown that even 30 minutes of lying supine can reduce oxygen levels in the baby's blood, causing decreases in heart rate variability. This is due to the compression of the inferior vena cava (the major vein returning blood to the heart). While most healthy pregnant women are quite fine lying on their backs, because there is a collateral vein (the azygos) bringing blood to heart, the fetus does notice the effect. Since Yin Yoga does involve long-held postures, the pregnant woman during her last 3 months of pregnancy may want to avoid reclined or supine postures in Yin Yoga. (See the articles in this footnote for the science behind the recommendation[1].)

The intention of the Yin Yoga practice for pregnant women is not to acquire new ranges of motion or to linger too long in each posture, but rather to be more mindful, present and attentive. Many postures can help alleviate the stresses that build up during pregnancy, and some women have found the energetic value of the practice to be quite helpful. Sarah Powers, one of the pioneers of Yin Yoga, continued her practice during her pregnancy and writes eloquently about it in her book *Insight Yoga*:

> Among the many benefits to doing a Yin Yoga practice while pregnant is that the poses stimulate the tissues to help create more fluid mobility throughout the system, increasing the comfort in the body as it grows and changes. Stimulating the meridians in this way also contributes to a healthier organ system, another plus, because the organs are working harder during pregnancy and lactation. Because the practice serves as a needle-less acupuncture session, it can help balance a woman's overall energy and emotions, which are naturally destabilized by the hormone infusion during this time. Last, but perhaps the most important reason to practice [Yin Yoga] is the meditative atmosphere it creates. I feel that learning or continuing to deepen into mindfulness during pregnancy is of utmost importance. In

> pregnancy as in motherhood, we are called on to ride the erratic emotions triggered by hormones. We need to be able to flow with difficult circumstances without prolonged inward rigidity and tension, which have a direct and immediate impact upon the fetus and child.[2]

Senior Yin Yoga teacher Diana Batts, who co-runs Yin Yoga teacher trainings, states that she would rather have pregnant women in her yin classes than other classes because it gives her more time as a teacher to attend to the students' needs. She can help the pregnant student become more aware of her body than is possible in yang classes.

Should all pregnant women do Yin Yoga? No, of course not. But this doesn't mean that most women will not benefit from it in a variety of ways. As always, pay attention! Don't try for great range of motion; rather, focus instead on relaxing, opening the energy body and being present.

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[1] *Back to basics: avoiding the supine position in pregnancy* (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5309362/);
Effect of maternal position on fetal behavioural state and heart rate variability in healthy late gestation pregnancy (https://www.ncbi.nlm.nih.gov/pubmed/27871127);
The effect of supine positioning on maternal hemodynamics during late pregnancy (https://www.ncbi.nlm.nih.gov/pubmed/29772936);
The collateral venous system in late pregnancy: A systematic review of the literature (https://www.ncbi.nlm.nih.gov/pubmed/28726308);
Hemodynamic changes in women with symptoms of supine hypotensive syndrome (https://www.ncbi.nlm.nih.gov/pubmed/31856296);

[2] Sarah Powers, *Insight Yoga* (Boston: Shambala Publications, 2008), 36.

Yin Yoga is not good for hypermobile students

The basic premise of this concern is

> Yin Yoga is dangerous for students who are hypermobile because the practice will make them even more mobile when what they need is more stability. If they are too mobile, they will harm their joints.

This concern has been raised many times by many people, from yoga teachers to physical therapists. It was such a common concern that I wrote a detailed response called Hypermobility and Yoga. Many of these points are repeated below.

We can generalize three causes of hypermobility:

1) Enhanced ranges of motion due to an injury to a joint
2) Enhanced ranges of motion due to a connective disease or disorder
3) Enhanced ranges of motion due to skeletal variations

1) Students who are hypermobile due to an injury to a joint should be careful of over-stressing that joint. It needs time to heal. This does not necessary mean that the joint should be immobilized, as that often leads to undesirable side effects, but care should be taken not to go to the joint's end range of motion because that end range is only possible right now due to damage to the restraining connective tissues. A yoga practice should work well within the

tolerable ranges of motion and should lead to strengthening the joint, not lengthening it.

2) Students who are hypermobile due to a connective tissue differences, for example someone with Marfan syndrome or Ehlers-Danlos syndrome, have a genetic difference in the way their collagen is structured. It is very loose and can allow too much movement in a joint. (It can also affect the health of blood vessels and organs.) These students should be very careful doing yoga in general, and that includes Yin Yoga. They do not need to work on increasing their range of motion but rather on building strength and stability in the joints. They can certainly try yoga, or even Yin Yoga, but only with great attention and with the intention of building strength in their tissues, not flexibility. They need to pay attention to how the practice affects them and how it feels—while they are in the postures, when they come out of the postures and over the next day or two. Through trial and error, through intention and attention, they will develop their own sensitivity to what works for them and what doesn't. If they were to try Yin Yoga (perhaps to obtain the meditative, psycho-emotional or energetic benefits), shorter holds of 1 to 2 minutes to start would be recommended, and they should try to go only halfway to their edge, not to their end range of movement.

   Students with connective tissue disorders do not always announce themselves to yoga teachers, nor do they always appear hypermobile, but if you do have a connective tissue difference, it is advisable to let your teacher know that you will be modifying the postures to suit your unique situation. As a teacher, please help to train the student to listen to their body, start easy and go slow.

3) The majority of people who are hypermobile are more flexible than the norm not because of an injury or condition, but due to the shape of their bones. What looks like a dangerous range of motion is actually quite normal and healthy, for them. They do not have to be brought back from their natural range of motion, although, like for every student, they should be guided to recognize when an end range has been reached and taught to not try to go past that point.

Many people are considered hypermobile. Estimates vary from less than 1% of the population to as much as 25%.[1] But, as we have just seen, the cause of the hypermobility has to be taken into consideration when evaluating physical exercises or yoga. One very mobile yoga student was told by her teacher, "You are too flexible for a Yin Yoga practice!" When asked why, she was told, "Putting any kind of stress on the ligaments is unhealthy and unsafe." She was, however, encouraged to continue her Ashtanga and Iyengar practices, which require far more ranges of motion that Yin Yoga does. Should she do Yin Yoga? Her intuition gave her a very different answer—she loved doing Yin Yoga along with her more active practices—but she had a dilemma. Who to believe? If the teacher had instead said, "Let's see if

we can determine why you are hypermobile and then decide on the best practice for you," together the teacher and student would have been able to develop a practice specifically suited to this student's unique requirements.

Despite the fear of stretching fostered by many teachers and therapists, most hypermobile people love to stretch and need to stretch![2] Curiously, stiffness is a common complaint of many hypermobile people. As they age or suffer injury, they lose the range of motion they once had, and although they may still look very flexible, they are not at their normal level. They crave stretching.

It is worthwhile to differentiate between stretching for health (which is okay for people in the third category) and stretching to increase an already unstable, hypermobile range of motion (which would not be good for those in category 1 or 2). Authors of a book promoting therapies for hypermobility wrote that we must note the difference between, "stretching performed in order to regain and maintain muscle length, relieve muscle tension, or restore and maintain joint range, and stretching to increase an already hypermobile range of motion. *It is good to stretch, but care is required.* [Emphasis added.] Educating an individual about how they can stretch safely without overstretching into their hypermobile or more vulnerable areas will help develop better body awareness, a skill which can be used in the future to ensure safe exercising."[3]

Based on these researchers' experience, yoga is not contraindicated and indeed can be a healthy adjunct to the exercises hypermobile people perform, with the caveat that sustained end of range movements are not recommended. Fortunately, in Yin Yoga, the postures are not extreme. There are no "put your foot behind your head" postures, or "drop backward and grab your ankles" movements. The postures are generally mild, but held for a long time. They are long, not deep, and a properly trained Yin Yoga teacher would be cautioning her students to stay where the sensations are reasonable, not maximal.

The fear of going too far is real for hypermobile people, and the danger can be real too. However, Yin Yoga can be a safe practice, one that does not challenge end ranges of motion, but one that does provide the stress hypermobile people crave and need. Yin Yoga does target the connective tissues, which is where pathology may lie for people with genetic connective tissue disorders. However, for students who are hypermobile, not because of any condition or disease but because of the unique shape of their bones, there is no pathology preventing them from going to their natural, full range of motion. It is safe to go there.

Before starting any exercise practice, yoga or otherwise, it is wise to check with your health care provider to make sure this is a good idea. Do your research. If you are hypermobile and choose to do Yin Yoga, practice with attention and intention. Start easy—short holds at first of 1 to 2 minutes, only going halfway to your end range of motion. Notice how you feel during and after the practice, work toward longer holds,

but remember the intention is not enhanced range of motion; the intention is regain and maintain optimal health.

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[1] See D.L. Scher, B.D. Owens, R.X. Sturdivant and J.M. Wolf, "Incidence of joint hypermobility syndrome in a military population: impact of gender and race," *Clinical Orthopaedics and Related Research* 468.7 (July 2010): 1790–5. doi: 10.1007/s11999-009-1182-2.

[2] "An unpublished audit at Guy's Hospital in 1986 reported by Harding (2003) revealed that patients with joint hypermobility found stretching helpful. This came as a surprise to the audit's authors, but has been borne out repeatedly in clinical experience. Stiffness is a common complaint, with many hypermobiles saying they 'feel like a 90-year-old'." From Rosemary Keer and Katherine Butler, "Physiotherapy and occupational therapy in the hypermobile adult," *Hypermobility, Fibromyalgia and Chronic Pain*. (2010). doi: 10.1016/B978-0-7020-3005-5.00013-6.

[3] Ibid.

Yin Yoga is not good for yoga beginners

This concern can take the form of

- Yin Yoga is an advanced practice, not suitable for beginners.
- Yin Yoga is too deep for beginners; they can hurt themselves.

I wrote an article on this topic entitled Can Beginners Do Yin Yoga? Here are a couple of excerpts from the article, but for the full response, I encourage you to read the full article.[1]

> Years ago, I had my doubts—I was not sure that beginners to yoga should start their journey with Yin Yoga. My fears came from a worry that a beginner would not know enough to come out of the posture when the sensations became too intense, that they might stay too long and hurt themselves. I have since discovered that this was selling people short. People know what pain is, what they don't always know is how to pay attention to the more subtle sensations that arise in yoga asanas. I have found more yang students (doing regular hatha, vinyasa or hot yoga) get injured than the students coming to the slow-paced yin offering.
>
> One of the big benefits of a Yin Yoga practice is [the] ability to pay attention: in the yang forms of yoga, we are only in a posture for a short period—five breaths, or maybe a minute or so. In Yin Yoga we literally marinate in the juiciness of the pose, and pay attention to the flow of sensations. Yin Yoga

> gives us a chance to learn what sensations are, where they are, whether they are healthy, albeit challenging, or too much. We learn what an edge is, which is something that can be missed entirely in our yang practice. In the yang styles of yoga, especially for beginners, we are worried so much about all the details of the postures: the alignment, the muscular engagements, the teacher's directions, the breath, the bandhas … With Yin Yoga, we have time to learn how to pay attention to sensations, to our edge.
>
> In Yin Yoga, the student is given the time and guidance needed to experience their body and the effect on their body that the postures create. With this training, they will know when they have reached a good edge. They can develop their own sensitivity to what they need, when to go deeper and when to back off. With this entry into yoga, the student will be well equipped to join the faster-pace yang forms of yoga.

Yin Yoga offers a great way to begin a yoga practice, one that can branch out in many directions and that can last for the rest of your life. Yes, beginners definitely can start their yoga journey with Yin Yoga.

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[1] This question was also raised in the Forum at www.YinYoga.com, posed by a beginning student. The discussion can be found here.

Yin Yoga is not good for people with cancer

This concern is pretty straightforward:

> People with cancer should avoid Yin Yoga. The long-held stresses are contraindicated.

A major fear in working with yoga students who have cancer is the interaction between their cancer therapy and the physical stresses of their yoga practice. For example, chemotherapy uses toxic drugs to kill cancer cells, but to protect themselves, cancer cell create regions of high pressure inside the body to push these toxins away. If our yoga practice (or indeed even a massage session) increases the pressure in the tissues, this could prevent the drugs from getting to where they need to go. However, it is not true that massage or yoga cannot be helpful. They can—they just need to be done under the guidance of well-trained therapists and yoga teachers.[1]

Benefits from massage for cancer patients include reduced anxiety, pain and fatigue while improving immune function.[2] While yoga cannot cure cancer, the benefits from yoga are similar to those from massage: reduce anxiety, depression, tiredness (fatigue) and stress for some patients.[3] Yin Yoga may be even better than active or dynamic yoga practices due to the time available to slow down, develop mindfulness and work with easy breathing patterns. In these cases the practice is not about building flexibility, so there is no need to go to a deep edge; the student can be content to relax and even use props to reduce any discomfort.

Some evidence that Yin Yoga may be effective in helping with cancer comes from the laboratory work of Helen Langevin. Her research team discovered that long-held stresses (10 minutes once a day over 4 weeks) can reduce tumor size by 52% compared to a control group.[4] Unfortunately the subjects in her experiment were mice, and we have no studies on the effect with humans, but the reasoning is quite sound. The study reported

> Recent studies have shown that gentle daily stretching for 10 minutes can reduce local connective tissue inflammation and fibrosis. Because mechanical factors within the stroma can influence the tumor microenvironment, we hypothesized that stretching would reduce the growth of tumors implanted within locally stretched tissues and tested this hypothesis in a mouse orthotopic breast cancer model…. Tumor volume at end-point was 52% smaller in the stretch group, compared to the no-stretch group.[5]

(If you want to learn more, Langevin gave an interesting talk on this topic called Stretching, Connective Tissue, Inflammation and Cancer.)

As with so many things, we cannot make a dogmatic assertion and say that yoga in general or Yin Yoga specifically will help every cancer patient. We have no studies showing it can cure cancer, but there are indications that it may "help to reduce anxiety, depression, tiredness (fatigue) and stress for some patients. And it has improved the quality of sleep, mood and spiritual well being for some people."[6]

So, should cancer patients do Yin Yoga? Maybe! It depends on so many variables: the person, what type of cancer, the stage of treatment, doctor's advice, etc. What we can say is that Yin Yoga might be helpful. If you have cancer and want to try Yin Yoga, here are some suggestions from Cancer Research UK to follow:

- Don't do yoga alone at home until you've practised it with a qualified teacher.
- Tell your teacher about any medical problems you have, including back and joint problems, before you begin.
- Stop and tell your teacher if any posture is painful for you.
- Never try difficult postures, such as [inversions], without first being shown how to do this by a qualified teacher.[7]

In general, yoga is well tolerated by cancer patients,[8] but it would be a good idea to let your health care team know what you are doing.

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[1] For more on massage and cancer see Cancer and Massage: Clinical Thinking and Cancer, and this article from BreastCancer.org.

[2] See Gail Ironson and Maria Hernandez-Reif, "Massage Therapy for Reducing Stress Hormones and Enhancing Immune Function in Breast Cancer Survivors," *Journal of Psychosomatic Research* 57.1 (July 2004): 45–52.

[3] See Cancer Research UK.

[4] See Berrueta L. et al., "Stretching Reduces Tumor Growth in a Mouse Breast Cancer Model," *Scientific Reports* 8.1 (December 2018).

[5] Ibid.

[6] Cancer Research UK, "General Cancer Research – Yoga."

[7] Ibid.

[8] H. Cramer et al. "Yoga for improving health-related quality of life, mental health and cancer-related symptoms in women diagnosed with breast cancer," *The Cochrane database of systematic reviews* 1 (2017). doi: 10.1002/14651858.CD010802.pub2.

Yin Yoga is not good for people with osteoporosis

One prominent yoga teacher said

> One of the primary dangers of Yin Yoga practice, in general, is that it encourages extended periods of flexion of the spine—something that should be avoided by someone with low bone density, osteopenia or osteoporosis.[1]

This quotation is from Margaret Martin's 2012 blog post. She doesn't dismiss Yin Yoga out of hand, and in fact lists several Yin Yoga postures that are "generally safe for individuals with osteoporosis, osteopenia or low bone density." However, she also lists several postures that, in her view, are dangerous because they put undue flexion stresses along the spine, too much rotation stress along the neck of the femur, or too much stress into the knees. She may be right—for a few people—but she may also be overly protective for the vast majority of folks.[2]

Margaret is very experienced in teaching students with osteoporosis. She believes that these students must not allow their spines to flex at all: all flexion must come from the hips. I believe that this is an over-reaction and an over-simplification. Outside the yoga studio, people with osteoporosis flex their spine through simple, daily living. Leaning over the bathroom sink to brush teeth, bending over to tie shoes, reaching for the kale in the fridge or for the salt on the table all cause some flexion in the spine. Yes, they can go too far: but to never stress the spine will lead to atrophy of the tissues you are trying to protect. (There is a term for this: disuse

osteoporosis![3]) For people with mild osteoporosis, some flexion is necessary to maintain back health; for people with severe osteoporosis, caution is reasonable.

Opinions on this topic vary widely. Greg Lehman, a well-known physical therapy teacher and trainer, has said, "Spinal flexion under low loads (like stretching) has not been proven to be a risk factor for disc pathology."[4] Indeed he has written extensively on this topic and considers the concern to be unwarranted.[5]

On the other hand, in his book *Yoga for Osteoporosis*, Dr. Loren Fishman, a yoga teacher and M.D., cites a 1984 study done by researchers at the Mayo Clinic that show flexion of the spine is very bad but extension is very good.[6] However, the flexion exercises were yang exercises: they were basically sit-ups. People who cite this study often extrapolate and say any flexion of the spine is harmful. But this was not what the study claimed.

It is great that the Mayo Clinic study showed extension of the spine (basically Locust poses and seated scapular retractions, the kind we do in Eagle Arms) helps reduce the risk of fracture. This shows that we should keep doing extensions of the spine and build spine health. (In the Yin Yoga repertoire, keep offering Sphinx, Seal and Saddle pose.) But are all flexions contraindicated? I have found no studies that have investigated long-held, gentle stress of the spine in flexion and its impact on bone mineral density. At best we can say we don't know, but maybe to avoid any risk we should avoid all flexions. However, is this really appropriate?

Avoiding all flexion may be harmful to your spine! All tissues need stress to become or stay healthy. Too much stress can be harmful, but so can too little. The Mayo Clinic study above showed that yang stresses on the spine are not good for women with osteoporosis, but they did not study women with osteopenia (a precursor condition to osteoporosis) nor the effect of yin stresses. We have known since the time of Julius Wolff[7] that bones need some stress to remain strong: if we never allow any stress of the bones, they will atrophy.

Yang yoga can generate a large amount of transient stresses on the bones and joints due to the pulling power of the muscles. Indeed, a muscular stress on the bone generates several times more stress than the body's own weight can generate.[8] However, Yin Yoga theoretically generates smaller stresses because they are only due to gravity, not muscular effort. In Yin Yoga, time is the magic ingredient, not intensity. There is a big difference between yang stresses and yin stresses, but there has been no studies evaluating these differences. All we have to guide us is reasoning by hypothesis and individual experiences.

In 2015, Dr. Fishman and his fellow researchers completed a long-term study[9] on over 700 people performing a daily 12-minute yoga practice using 12 postures. About 83% of participants had either osteopenia or osteoporosis. Bone scans to measure bone density were done at the beginning of the study and then about 4~5 years later. The poses were held on average for about 30 seconds per side, so these

were "yang" stresses. The postures included several standing poses, twists and back extensions. No direct flexion postures were included. The results of the study showed significant improvements in bone mineral densities. The conclusion of the study was

> The 12 yoga poses studied here appear to be a safe and effective means to reverse bone loss in the spine and the femur.[10]

These 12 yang postures proved to be safe and beneficial for osteoporotic spines. Is Yin Yoga safe for students with osteoporosis? Maybe! Certainly, care should be taken, but some stress to the bones is healthy and Yin Yoga can be a safe way to obtain that stress. Dr. Fishman's studies have shown that twists and extensions can be safe and helpful. However, since every body is different, whether you should do flexions is not something we cannot say a priori. Work with your medical team/therapist; experiment a little; check in with the results and adjust from there.

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[1] See Margaret Martin's blog and video on her website.

[2] In the Forum at www.YinYoga.com, I have written a longer response to Margaret's blog called yin poses/osteoporosis.

[3] See NASA's explanation of disuse osteoporosis.

[4] Greg Lehman, "If you want to stretch your hamstrings please continue to do so," *Reconciling Biomechanics with Pain Science* (2012).

[5] See Greg Lehman's articles here and here.

[6] A more recent, 2019 Mayo Clinic study on the same topic found that only extreme flexion or extension positions caused problems. "Yoga has many benefits. It improves balance, flexibility, strength and is a good social activity," says Mehrsheed Sinaki, M.D., a Mayo Clinic physical medicine and rehabilitation specialist and the study's senior author. "But if you have osteoporosis or osteopenia, you should modify the postures to accommodate your condition."

[7] See the work of Julius Wolff, a German anatomist in the late 1880s.

[8] Again, I recommend Dr. Fishman's book *Yoga for Osteoporosis* for a good overview of the cellular effects of exercise on our bone cells

[9] See Yi-Hsueh Lu, Bernard Rosner, Gregory Chang and Loren M. Fishman, "Twelve-Minute Daily Yoga Regimen Reverses Osteoporotic Bone Loss," *Topics in Geriatric Rehabilitation* 00.0 (2015): 1–7.

[10] Ibid.

People with fibromyalgia should not do Yin Yoga

This concern is pretty straightforward:

> Anyone with fibromyalgia should avoid Yin Yoga because it will make his or her condition and pain worse.

Before replying to this concern, let's define what fibromyalgia is. According to the Mayo Clinic, "Fibromyalgia is a disorder characterized by widespread musculoskeletal pain accompanied by fatigue, sleep, memory and mood issues. Researchers believe that fibromyalgia amplifies painful sensations by affecting the way your brain processes pain signals."[1]

We don't know the cause of fibromyalgia, but we do know what can make the symptoms worse: stress and physical or emotional trauma. The pain may be made worse due to sensitization in the brain to nerve signals: the more the brain experiences pain, the more sensitive it is to pain. This can lead to an over-reaction to even slight pain signals coming from the body, thus amplifying the signal.

Treatments may include drugs and anti-depressants but can also include physiotherapies, including massage and yoga. Again, according to the Mayo Clinic, "At first, exercise may increase your pain. But doing it regularly often decreases symptoms. Appropriate exercises may include walking, swimming, biking and water aerobics. A physical therapist can help you develop a home exercise program.

Stretching, good posture and relaxation exercises also are helpful."[2]

So, one key is to reduce stress (which can include yoga and meditation or mindfulness), move and stretch the body (which again can include yoga) and go gently and slowly (which is the recipe for Yin Yoga). Indeed, a 2018 study compared the effectiveness of stretching versus resistance (strength) training and found "Muscle stretching exercise was the most effective modality in improving quality of life, especially with regard to physical functioning and pain, and resistance training was the most effective modality in reducing depression."[3] An earlier study in 2013 looked at several modalities including yoga, t'ai chi, qigong and a variety of other exercises therapies and found each one to have some positive benefits with no adverse reactions.[4] A 2011 study incorporated yoga and meditation over 8 weeks and "found significant improvement in the overall health status of the participants and in symptoms of stiffness, anxiety, and depression."[5] A 2010 study found that a weekly led-class combined with at-home practice over 8 weeks "showed significantly greater improvements on standardized measures of [fibromyalgia] symptoms and functioning, including pain, fatigue, and mood, and in pain catastrophizing, acceptance, and other coping strategies."[6] The practices in this study were based on the Kripalu tradition and incorporated mindfulness training.

While there have been no specific studies of Yin Yoga related to fibromyalgia, Yin Yoga has been specifically recommended for patients with fibromyalgia by the Pain Doctor website[7] and Sharecare.com.[8] However, as with all specific conditions, everyone's experience is unique. Fibromyalgia is not one thing but a constellation of problems. What works for one person may not work for another. Whether Yin Yoga can help you, if you suffer with fibromyalgia, is something you will have to investigate personally. There does not seem to be any a priori reason to not try it, but check with your health care team, let them know what you plan to do, and practice with both awareness and intention.

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[1] Mayo Clinic, "Fibromyalgia."

[2] Ibid.

[3] A. Assumpção et al., "Muscle stretching exercises and resistance training in fibromyalgia: which is better? A three-arm randomized controlled trial," *European Journal of Physical and Rehabilitation Medicine* 54.5 (October 2018): 663–670.

[4] See Scott David Mist et al., "Complementary and alternative exercise for fibromyalgia: a meta-analysis," *Journal of Pain Research* 6 (2013): 247–260.

[5] J. Hennard, "A protocol and pilot study for managing fibromyalgia with yoga and meditation," *International Journal of Yoga Therapy* 21 (2011): 109–21.

[6] J.W. Carson et al., "A pilot randomized controlled trial of the Yoga of Awareness program in the management of fibromyalgia," *Pain* 151.2 (November 2010): 530–539.

[7] See their page "3 Amazing Benefits of Yoga for Fibromyalgia Pain."

[8] See their page "Best Yoga for Fibromyalgia."

Yin Yoga is not good for athletes

There are two concerns raised in regards to athletes doing Yin Yoga. The first concern can be found in one yoga teacher's comments:

> Another style that I'm not crazy about—Yin yoga—is widely marketed to athletes. The deep, static stretches of Yin are intended to stretch out the connective tissue—including ligaments. I don't agree with encouraging athletes to stretch out areas that provide joint stability.

The second concern is

> Static stretching before sports will diminish power, strength, speed and thus athletic performance.

Addressing the first concern requires a review of the effects of Yin Yoga on ligaments, connective tissues and joints, which has been covered in three other sections. Rather than repeat these discussions, here are links to those responses:

- You shouldn't stretch ligaments, tendons, joints, connective tissue or fascia
- You shouldn't stretch joints
- To protect joints, we must engage muscles, not relax them

However, one brief observation is worth making in regards to whether flexibility is related to increased risk of injury in athletes. A 2019 study found that extreme

flexibility and extreme inflexibility were correlated with an increased risk of injury, but for athletes of moderate flexibility, improving flexibility either did not affect injury risk at all, or in some cases prevented injuries. One conclusion of this study was that there is "no evidence of harmful effects of stretching."[1]

This leaves the second concern: does stretching before sports diminish performance? The science is not clear and the research seems to follow cycles of differing recommendations. From the 1940s to the 1990s the consensus was that static stretching was a good thing for athletes. But from the late 90s to early 2000s, this attitude changed and static stretches were frowned upon. Over the last few years, however, the tide has turned again and static stretching is favored once more, as long as the stretches are less than 60 seconds.

Theoretically, stretching can create creep in the muscles and surrounding fascia, lengthening them and reducing their contractile strength.[2] We need our springs (the tendons and ligaments) to be tense, not loosened, to achieve maximum performance. Based on this reasoning, stretching before sports does not seem like a good idea. This logic seems clear and compelling. To quote a 2012 review that looked at over 100 studies on this topic, the attitude in the 2000s was, "acute muscle stretch can significantly impair muscle performance [so] it should be used with caution in a preexercise routine."[3] This attitude led to a widespread consensus for "the removal of static stretching as part of a warm-up routine and to only include cardiovascular work when strength or power was important to performance."[4] In other words, athletes were cautioned not to stretch before sports. However, in recent years, these recommendations are being reconsidered.

A closer look at the evidence reveals that the effect of stretching muscles is dose dependent. Quoting the lead author of the 2012 review, Dr. Anthony Kay, "the duration of stretch at which significant reductions [in performance] are likely is approximately 60 seconds; however, longer durations (>2 minutes) did not further increase the likelihood of significant reductions." The findings were "to largely agree with previous suggestions that acute static stretching can reduce maximal muscle performance," but only for longer-held stretches. Below 60 seconds there was no performance degradation and for stretches over 60 seconds, "there is only a moderate effect."[5]

More recent studies have found positive benefits to short static stresses on sports performances.[6] "[Participants] experienced positive psychological benefits expressing that they were more likely to perform well when stretching was performed as part of the warm-up, irrespective of the stretch type. A positive psychological outlook is an important component of optimal performance."[7]

That is all great for short duration static stretches, but the consensus on longer stresses (i.e., Yin Yoga-like stresses) remains that power and speed is reduced. This may be due to decreased neural activation more than creep, but the causes have not been clearly determined.[8] What is pretty clear is that longer-held stretches result in

"changes in viscoelastic properties of the [muscle/tendon unit] which result in increased … compliance and a subsequent decrease in … stiffness."[9]

The studies found ranges of strength reductions of between 4~8% when stretches are held for 60 seconds or longer. For elite athletes this can be significant. However, for some athletes, like hockey goalies, rock climbers, gymnasts and dancers, the increased flexibility, such as the ability to do a full splits, may be more important than the loss of some strength. Like most things in life, whether you should do long-held stretches before your sport depends! It depends on your intentions. To quote Dr. Kay one last time, "It is likely that durations of stretch used in the warm-up routines of most recreational exercisers produce negligible and transient reductions in strength."[10] Or in other words, Yin Yoga will not be a problem for recreational athletes.

While Yin Yoga before sports may not be a good idea for some elite athletes, Yin Yoga *after* sports may be very good for all athletes. Many athletes feel tight after their sessions. When muscles are constantly engaged or used, they can become contracted and shortened. Stretching after exercise can help to loosen the muscles and surrounding fascia and regain the normal elasticity and ranges of motion. Static stretching for 5 minutes has been found to significantly improve range of motion and decrease passive stiffness.[11]

Karl Riecken, an exercise physiologist working with triathletes, believes that long-duration static stretching after working out may prevent painful muscle knots, decrease procollagen production (which is actually a good thing because it helps to align the collagen fibers better), and create the greatest changes in functional range of motion.[12] He suggests, "After you've accomplished the session, static stretch again the muscle groups from which you are seeking to greatly increase range of motion in the long term. Do this for 5 to 10 minutes in each position. The longer you stay in that stretch, the more effect on your perception of discomfort in that position and the greater the enhancement of your range of motion. Personally, I work on my hip adductors (groin) and hip flexors (including psoas and quads) particularly after running."[13] While Riecken doesn't use the term Yin Yoga, his descriptions for long-held static stretches is basically just that.

Most of the studies cited looked at short-term, acute effects of static stretching. However, studies looking at long-term, chronic effects have shown that static stretching does not lessen an athlete's strength, power or speed, but actually can increase performance.[14] Unfortunately, these studies tend to mix both short holds and longer holds, so we cannot claim that Yin Yoga will improve performance, but we can say that it doesn't make performance worse in the long term.

Finally, Yin Yoga works more than just the physical body. There are many reasons people come to Yin Yoga, even athletes, beyond the physical. There are meditative benefits, the ability to recognize and deal with stress, work with the breath to calm

and relax, as well as previously cited "positive psychological benefits." Why wouldn't athletes of all stripes want these benefits?

In short: The scientific consensus has varied considerably over the decades, but currently it is believed that short static stretching before your sport or workout may improve your performance or reduce your chance of injury. Longer static stretches before your sport may improve your range of motion, but at a cost of a slight decrease in speed and power. Additionally, Yin Yoga after your session may help you recover more quickly from your workout and improve range of motion over the long term. Athletes should feel free to experiment with Yin Yoga and see how it can work for them.

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[1] Marie Moltubakk discusses how improving hamstring flexibility, hip abduction, hip external rotation and shoulder internal rotation reduced injury risks in her 2019 presentation of her doctoral thesis.

[2] See my article on Creep and Counterposes.

[3] A.D. Kay and A.J. Blazevich, "Effect of acute static stretch on maximal muscle performance: a systematic review," *Medicine & Science in Sports & Exercise* 44.1 (January 2012): 154–64.

[4] Ibid.

[5] Ibid.

[6] "[Less than 60 seconds of static stretches] per muscle group resulted in increased ROM and either no change or beneficial effects on strength and power performances" from Helmi Chaabene et al., "Acute Effects of Static Stretching on Muscle Strength and Power: An Attempt to Clarify Previous Caveats," *Frontiers in Physiology* 10 (2019): 1468.

[7] Ibid.

[8] See T.B. Palmer, J.G. Pineda, M.R. Cruz and C.C. Agu-Udemba, "Duration-dependent effects of passive static stretching on musculotendinous stiffness and maximal and rapid torque and surface electromyography characteristics of the hamstrings," *The Journal of Strength and Conditioning Research* 33 (2019): 717–726.

[9] Ibid.

[10] A.D. Kay et al., "Effect of acute static stretch on maximal muscle performance: a systematic review."

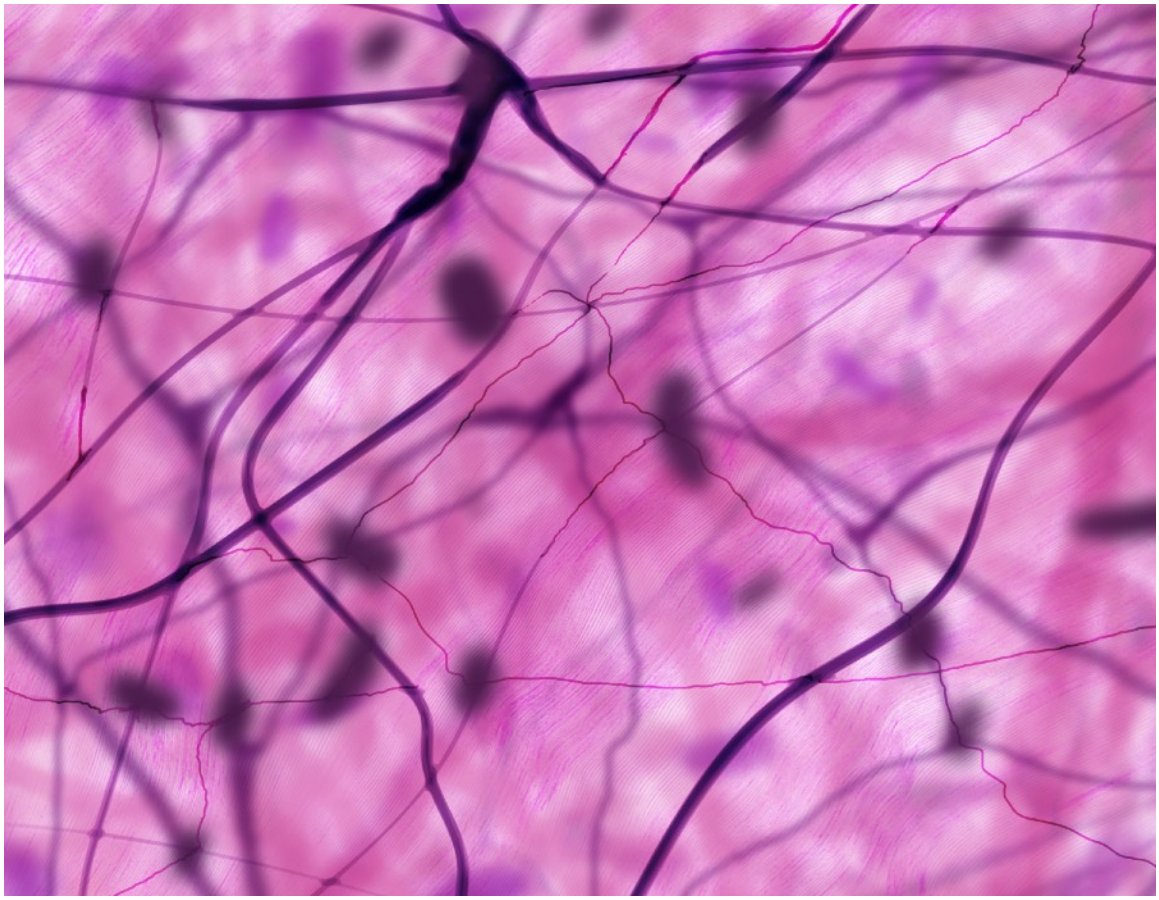
[11] See S. Matsuo, S. Suzuki, M. Iwata et al. "Acute effects of different stretching durations on passive torque, mobility, and isometric muscle force," *The Journal of Strength and Conditioning Research* 27 (2013): 3367–3376.

[12] See Karl Riecken, "The benefits of static stretching before and after exercise," *Training Peaks.com* (July 1, 2016). Karl Riecken is the Coordinator of Performance Testing and Exercise Physiologist at the USA Triathlon Performance Training Center-Certified National Training Center in Clermont, FL.

[13] Ibid.

[14] See Marie Margrete Hveem Moltubakk's 2019 doctoral dissertation "Effects of long-term stretching training on muscle-tendon morphology, mechanics and function," presented by the Norwegian School of Sport Sciences. You can view Marie Moltubakk presenting her doctoral thesis in this 2019 YouTube video presentation.

There is no scientific proof that Yin Yoga works



This simple concern takes the form

> There is no scientific evidence that Yin Yoga works.

We could refute this claim with the simple observation that the absence of proof is not proof of absence. Just because there is no scientific evidence that something does not work does not mean that it doesn't work. It simply means it has not been proven yet. There could be many reasons for this lack of proof, including the simple fact that the topic has not yet been studied scientifically. However, we do not need to use this argument, because Yin Yoga has been studied and found effective. It does work!

Investigations into the science behind how Yin Yoga works is addressed in a Forum section at www.YinYoga.com called The Science Behind Yin Yoga and in an article called A Scientific Basis for Yin Yoga. This article explains that there are four levels of evidence that can be offered for any scientific assertion or theory:

1) Testimony (anecdote)
2) Argument (hypothesis)
3) Correlation
4) Experimentation

These are listed in order of increasing validity and acceptability: the anecdote is the weakest form of proof, while an experiment is the strongest. While weak, an anecdote is still evidence, and if your personal experience is that Yin Yoga works for you, makes you healthier or cured a specific ailment, then what more proof do you really need? Your personal, anecdotal experience should be considered strong proof that, for you at least, Yin Yoga is efficacious.

The strongest form of evidence is a double blind, controlled experiment: this is the "gold standard" in the medical industry. And there have been a couple of such experiments done with Yin Yoga (see the YOMI studies below). In addition, there are many other studies that, while not specifically investigating Yin Yoga, do investigate the effects of long-held, static stresses. Through these findings, hypotheses can be constructed that show that if the interventions in these experiments worked to improve the health and well-being of the subjects, then applying similar interventions in a Yin Yoga practice should have similar benefits.

Following this line of reasoning, the rest of this section lists studies that investigated either Yin Yoga directly or long-held static stretching and found positive results. Links are provided for the interested reader to look deeper into the research. The point should become clear: Yin Yoga does have significant scientific evidence to support its claim that it is beneficial for most practitioners.

The YOMI studies

A Swedish group looked at the relationship between Yin Yoga, mindfulness and stress and worry. They called their program YOMI.

> The YOMI program is a psychoeducational training and physical practice-based program that bridges knowledge from evidence-based psychotherapy with the practice of mindfulness and yin yoga.[1]

The YOMI studies have shown directly that Yin Yoga can trigger the parasympathetic nervous system and provides many health benefits. Their 2017 study found

> [Yin] yoga stimulates the parasympathetic nervous system, which slows down breathing, heart rate and relaxes the body...[2]

Their 2018 study[3] found that a 5-week Yin Yoga-based intervention appeared to reduce both the physiological and psychological risk factors known to be

associated with non-communicable diseases. The study suggests that incorporating Yin Yoga could be an easy and low-cost method of limiting the negative health effects associated with high stress.

For more details on the YOMI findings and to read the lead author (Frida Hylander) directly, visit the YOMI website.

Acute effects of Yin Yoga and aerobic exercise on anxiety

Another study, done in 2019, looked at the effects of Yin Yoga on anxiety and came to the conclusion:

> …there was a significant reduction found in state anxiety and trait anxiety after the yin yoga, with no changes in trait mindfulness. The results indicate that yin yoga has an anxiolytic effect, although the uneven number of participants made comparison difficult. Yin yoga should be considered as a potential treatment option for anxiety.[4]

Historical precedence

The 19th century German anatomist, Julius Wolff, discovered that bone subject to constant or repetitive loading will become stronger, and thus more able to resist the deformation caused by the load. This observation became known as Wolff's Law. The inverse is also true: an unloaded bone will become weaker. The mechanism by which the bone grows stronger is called mechanotransduction, which is a process through which forces or other mechanical signals are converted to biochemical signals. Simply put, bones need stress to be healthy and Yin Yoga can provide one form of the necessary stress.

Similarly, there is a law governing soft tissue development named after the early 20th century America orthopedic surgeon, Henry Davis. This is known as Davis's Law and states

> Ligaments, or any soft tissue, when put under even a moderate degree of tension, if that tension is unremitting, will elongate by the addition of new material; on the contrary, when ligaments, or rather soft tissues, remain uninterruptedly in a loose or lax state, they will gradually shorten, as the effete material is removed, until they come to maintain the same relation to the bony structures with which they are united that they did before their shortening. Nature never wastes her time and material in maintaining a muscle or ligament at its original length when the distance between their points of origin and insertion is for any considerable time, without interruption, shortened.[5]

In more plain language, stresses are needed to maintain and regain optimal health and strength of both bony and soft tissues. One way to apply this stress is via long-held, static stresses such as those employed in Yin Yoga.

While all this has been known for over a century, there is more recent evidence supporting these findings, as shown in the next few sections.

Studies on static progress stretches

Static progressive stretch (SPS) is one of a group of therapeutic interventions used to help patients regain lost range of motion while decreasing pain, stiffness and swelling. It is used with patients who have undergone surgery or trauma that required immobilization of a joint. With these devices the joint is taken to its tolerable limit of movement (end range) for a period of time. Once the sensation ebbs, the patient then is free to increase the stress, taking the joint to a new end range, and again hold there. Through this progressive approach, at each setting the joint is subjected to a constant level of movement, and as the joint is held at this position, the stress level within the tissues lessens. Thus we have the name static progressive stretch. This is very similar what we do in the Yin Yoga practice. (More information on the similarities between Yin Yoga and SPS can be found in the article Static Progressive Stretch and Yin Yoga.)

The following are studies that have shown the effectiveness of SPS:

- C.R. Costa, M.J. McElroy, A. Johnson et al., "Use of a static progressive stretch orthosis to treat post-traumatic ankle stiffness," *BMC Research Notes* 5 (2012): 348.
- P.M. Bonutti, G.A. Marulanda, M.S. McGrath et al., "Static progressive stretch improves range of motion in arthrofibrosis following total knee arthroplasty," *Knee Surgery, Sports Traumatology, Arthroscopy* 18.2 (2010): 194–199.
- S.D. Ulrich, P.M. Bonutti, T.M. Seyler et al., "Restoring range of motion via stress relaxation and static progressive stretch in posttraumatic elbow contractures," *Journal of Shoulder and Elbow Surgery* 19.2 (2010): 196–201.
- M. Ibrahim, A. Johnson, R. Pivec et al., "Treatment of adhesive capsulitis of the shoulder with a static progressive stretch device: a prospective, randomized study," *Journal of Long-Term Effects of Medical Implants* 22.4 (2012): 281–291.

Splinting can also create long-held, static stresses and help to avoid contracture

A 1987 study of contracture repair contrasted short, intense stresses like we find in an active yoga practices with long-held, mild stresses like we find in a Yin Yoga practice. The researcher concluded,

> The longest period of low force stretch produces the greatest amount of permanent elongation, with the least amount of trauma and structural weakening of the connective tissues.[6]

The shorter, more intense stresses (more yang-like) were observed to have resulted in

> … a higher proportion of elastic response, less remodeling, and greater trauma and weakening of the tissue.[7]

In this case, Yin Yoga-like stresses proved more efficacious for joints suffering contracture than yang forms of stresses. Another way to state the findings is

> *Time is more important than intensity.*

Studies on acupressure and long-held stresses

Teams lead by Helen Langevin, director of the National Center for Complementary and Integrative Health and past professor at Brigham and Women's Hospital – Harvard Medical School, have shown how acupressure and acupuncture work their magic. These studies employ long-held, static stresses of 10 minutes once or twice a day over a period of a few weeks in mice. The results of these practices are fascinating.

1) Sarah M. Corey, Margaret A. Vizzard, Nicole A. Bouffard, Gary J. Badger and Helene M. Langevin, "Stretching of the Back Improves Gait, Mechanical Sensitivity and Connective Tissue Inflammation in a Rodent Model," *PLoS One* 7.1 (2012): e29831.

   This study used mechanical stretches lasting 10 minutes each, twice a day for 12 days. The tissue stretch mitigated inflammation-induced changes leading to restored stride length and intrastep distance, decreased mechanical sensitivity of the back and reduced macrophage expression in the nonspecialized connective tissues of the low back.

2) L. Berrueta, J. Bergholz, D. Munoz, I. Muskaj, G. J. Badger, A. Shukla, H. J. Kim, J. J. Zhao and H. M. Langevin, "Stretching Reduces Tumor Growth in a Mouse Breast Cancer Model," *Scientific Reports* 8 (May 18, 2018).

In this study, mice were injected with breast cancer tumors and divided into a control group and a stretch group. The stretch group was subjected to one full body stretch, held for 10 minutes, once a day for 4 weeks. After the intervention, the stretch group's tumors were 52% smaller than those in the control group.

3) Ying Xiong, Lisbeth Berrueta, Katia Urso, Sara Olenich, Igla Muskaj, Gary J. Badger, Antonios Aliprantis, Robert Lafyatis and Helene M. Langevin, "Stretching Reduces Skin Thickness and Improves Subcutaneous Tissue Mobility in a Murine Model of Systemic Sclerosis," *Frontiers in Immunology* 8 (February 16, 2017).

   This study investigated whether stretching would affect scleroderma, which is an autoimmune disorder that can alter skin, blood vessels, muscles and internal organs, making them weaker and thicker. Holding a full body stretch for 10 minutes, once per day, over 4 weeks improved skin thickness and mobility.

4) Highly recommended reading is an article Langevin wrote in May 2013 called The Science of Stretch, published in *The Scientist*. She discusses her research into long-held (up to 30 minutes) stresses on connective tissues and how it can cause a remodeling of the tissue and the architecture of the fibroblasts. She also discusses the mechanism by which acupuncture or acupressure reduces pain.

Studies of myofascial release

A 2015 study was done to answer the question of how much stretch and for how long is optimal to reduce pain, increase range of motion and improve physiologic function of joints. Myofascial release (MFR) is a physical therapy using long-held, static stretches. It was employed to stress joints and was shown to reduce inflammation and improve healing response to injury.

The researchers found that a strain (elongation) of 3% held for 5 minutes is ideal. Stresses above that level, which created a strain of 9% or 12% (that is a lot!), can cause problems, but a stress resulting in only a 3% strain can accelerate healing. The longer the stress is applied the better. The lengths of time varied from 1 to 5 minutes. This, in our Yin Yoga context, means less effort and longer holds are better. The researchers concluded, "Longer duration of MFR resulted in rapid decreases in wound size."[8]

Jules Mitchell, a yoga teacher and researcher, commented on this study: "Fibroblasts are highly responsive to differences in strain magnitude and duration. It appears that low magnitude and long duration is most effective

for tissue repair."[9] Once again we find that time is more important than intensity. That is Yin Yoga!

Fascial fitness training can employ long-held, static stresses

Robert Schleip is a director of the Fascia Research Group, Division of Neurophysiology at the University of Ulm in Germany and author of the book *Fascial Fitness*.[10] He studies how fascia works and how to make it work better. Fascial training may use small, elastic bounces while our muscles are in a stiffened position as well as slow, relaxed, static stretching of the kind we do in a Yin Yoga practice.

In Schleip's book he reports that fascial exercises ideally include both tensile stresses, which can cause a stretch, and compressive stresses, which squeeze our tissues. Compression and shearing stresses, which move two areas of the body in the opposite directions, stimulate metabolism and the supply of fluid in the tissues. Tissues are first dehydrated: water that contains inflammation-causing free radicals is squeezed out. Then, after the stresses have ended, the tissues slowly rebound, rehydrating with clearer water. Particularly effective in dehydrating and rehydrating tissues is the application of slow, persistent, yet gentle pressure, the kinds of stresses found in several forms of massage and in Yin Yoga. These forms of fascial exercise stimulate the release of anti-inflammatory messengers, which help to reduce friction and stuckness between fascial layers.

Schleip's book is based on many researchers' findings as well as his own studies. He and colleagues found that when mice lumbodorsal fascia were isometrically stretched for 15 minutes followed by a 30 minute rest, an increase in stiffness was observed. Subject to similar loading procedures, tissues showed decreases in fluid content immediately post-stretch and increases during rest phases. When allowed sufficient resting time, a super-compensation phenomenon was observed, characterized by matrix hydration higher than initial levels and increases in tissue stiffness. In other words, an alteration of the water content was observed.[11]

The switching of the state of water, from a gel-like state (think of Jell-O) to a solution state (liquid) and back again is a necessary component of healthy living. Yin Yoga is one way to help trigger these transitions.

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[1] Frida Hylander et. al., "Yin yoga and mindfulness: a five week randomized controlled study evaluating the effects of the YOMI program on stress and worry," *Anxiety, Stress & Coping* 30.4 (2017): 365–378.

[2] Ibid.

[3] See Daiva Daukantaitė et al., "Five-week yin yoga-based interventions decreased plasma adrenomedullin and increased psychological health in stressed adults: A randomized controlled trial," *PLoS One* (July 18, 2018).

[4] Denis Winroth et. al., "Acute Effects of Yin Yoga and Aerobic Exercise on Anxiety," *Alternative & Integrative Medicine* 82.2: 278.

[5] From John Nutt, *Diseases and Deformities of the Foot* (E.B. Treat and Company, 1913).

[6] George R Hepburn, "Contracture and Stiff Joint Management with Dynasplint," *Journal of Orthopaedic & Sports Physical Therapy* 8.10 (1987): 498–504.

[7] Ibid.

[8] Thanh V. Cao et al., "Duration and Magnitude of Myofascial Release in 3-Dimensional Bioengineered Tendons: Effects on Wound Healing," *The Journal of the American Osteopathic Association* 115.2 (2015): 72–82.

[9] See Jules Mitchell, *Yoga Biomechanics: Stretching Redefined* (Handspring Publishing, 2018), 131.

[10] See Robert Schleip, *Fascial Fitness* (Lotus Publishing, 2017).

[11] See R. Schleip, L. Duerselen, A. Vleeming et al. "Strain hardening of fascia: static stretching of dense fibrous connective tissues can induce a temporary stiffness increase accompanied by enhanced matrix hydration," *Journal of Bodywork and Movement Therapies* 16(2012): 94–100.

Yin Yoga comes from martial arts and is an advanced, extreme practice

An example of this concern is

> Yin yoga is extreme! It comes from a Chinese martial arts master, Paulie Zink, and who has an extreme amount of flexibility. This degree of hypermobility may be good for contortionists, but not for normal people.

This concern may be valid if the form of Yin Yoga being discussed is the form developed by Paulie Zink. However, this concern is not applicable to the style of Yin Yoga developed by Paul Grilley. To understand this distinction, a brief history of the naming of Yin Yoga is required. (For a longer explanation, see Who Owns Yin Yoga on the YinYoga.com Forum.) To avoid confusion I will refer to Paulie Zink's practice as "Yin Yoga (Z)" and Paul Grilley's as "Yin Yoga (PG)."

Paul Grilley began using the term "Yin Yoga" around the year 2000. (He published his book *Yin Yoga, Outline of a Quiet Practice* in 2002.) He and Sarah Powers decided to use the name "Yin Yoga" for their practice to differentiate it from the offerings of Paulie Zink's *Taoist Yoga*. Sarah coined the term "Yin Yoga," and this was the first use of the term. Paul had studied with Paulie once a week for several months in the late 1980s, but what Paul was offering by 2000 was not what Paulie was teaching. Paul's Yin Yoga was very different from Paulie's Taoist Yoga. However, in 2009 Paulie created the "Yin Yoga Institute," and by 2011 he was calling his Taoist Yoga "Yin Yoga," which created a lot of confusion that still exists today. To be clear, Paulie's teaching did not change; only the name of what he was teaching changed.

The teachings of Paul Grilley and of Paulie Zink are both wonderful practices, but they are very different practices: as different as chalk and cheese, or Ashtanga and restorative yoga. Paul did not intend or pretend that his offering was the same as Paulie's. Yin Yoga (Z) is a practice derived from Paulie's martial arts background. Paulie's practice is amazing, and if you are not familiar with it, there are many YouTube videos that capture its flavor and performance. Paulie has called his practice many things over the years: DaoYin, Taoist Yoga, Yin and Yang Yoga, and finally Yin Yoga.

While Paul did study with Paulie for several months, Paul never did Paulie's martial arts practice. Paul Grilley extracted the passive elements from Paulie's warm-up sessions that preceded his martial arts training, added a Traditional Chinese Medicine (TCM) basis for the energetic effects (thanks to his training with Dr. Hiroshi Motoyama), modern anatomical understanding (thanks to his studies with Dr. Gerry Parker and his own research), and placed it into a solid yogic tradition. Paulie Zink's offerings were never like this and still are not like this: his practice is still Taoist Yoga derived from his martial arts training. While it is amazing, it is not Yin Yoga (PG)—never was and probably never will be.

In a Yin Yoga (PG) class, the intentions are not to go to ultimate ranges of motion, not to hold beyond a reasonable amount of time, not to experience pain, or any other extremes. A good Yin Yoga teacher would never encourage extreme attitudes or expectations. Beginners can do Yin Yoga (PG) and, indeed, it may be better for beginners to yoga to start with a Yin Yoga (PG) practice than an active yang or vinyasa practice because they have time to learn how to sense their bodies (see the section on Yin Yoga is not good for yoga beginners.)

There are only ~25 postures used by most Yin Yoga (PG) teachers, if even that. I use about 15. This is not an extreme number! Think of the hundreds of postures in the yang world of yoga. In Yin Yoga (PG), there are no "foot behind the head" poses, or "drop back to wheel" or 108 sun salutations. The poses are seated and simple but challenging to a degree. The edge is not to be passed, but played. If pain arises, it is time to come out. Thus, I disagree with opening assertion of "Yin Yoga is extreme." That, arguably, may be true of Yin Yoga (Z), but Yin Yoga (PG) is far from extreme.

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Paulie Zink doesn't like "popular" Yin Yoga

[For context for this discussion, it would be best to read the concern: Yin Yoga comes from martial arts and is an advanced, extreme practice. Yin Yoga (PG) refers to the style of Yin Yoga developed by Paul Grilley, while Yin Yoga (Z) refers to the Taoist Yoga style as taught by Paulie Zink.]

Paulie Zink has made several statements critical of the style of Yin Yoga developed by Paul Grilley. Comments include:[1]

1) Too much yin is bad.
2) Yin Yoga should work the whole body.
3) Genuine Yin Yoga encompasses the energy of the animals.
4) Commercial Yin Yoga classes only teach 10 or 15 postures but [Paulie Zink's] classes will do two dozen different things with lots of movement and no timer.
5) Popular Yin Yoga is only the first stage of a deeper practice with thousands of postures available.
6) Yin Yoga was never meant to be dead yoga.

1) The first two concerns take the form of a straw man fallacy. A straw man fallacy presents a statement or assertion that is not actually part of the position or practice being critiqued. For example, the statement that "too much yin is bad" implies that the Yin Yoga practice as developed by Paul Grilley is flawed because you should not only do Yin Yoga. But neither Paul

Grilley nor any other Yin Yoga (PG) teacher has ever claimed that Yin Yoga is a complete practice. All Yin Yoga (PG) teachers would acknowledge that other practices (yang forms of exercise) are necessary for wholeness and health. (See the concern Yin Yoga in not a complete practice.) Indeed, Paul has often warned his students that yoga by itself is insufficient for optimal health. For example, he advises yoga students to also add resistance training with weights. His Yin Yoga DVD has several wonderful, yang flows such as the Golden Seed and the Dragons.

2) The second straw man is the claim that Yin Yoga should work the whole body, implying that Yin Yoga (PG) is only for the lower body. However, in the Yin Yoga (PG) style, upper body stresses are also employed. For example, in the book *The Complete Guide to Yin Yoga* there is a section on Yin Yoga for the upper body. (I also offer such practices in this article.) Paul Grilley has pointed out that the primary targeted areas for Yin Yoga (PG) are the hips and the spine, as these areas tend to tighten more and more quickly as we age, but this does not mean that other areas cannot be targeted. Yin Yoga (PG) can target and affect the whole body.

3-5) The next three concerns all employ a similar tactic of conflating the Yin Yoga (Z) style with the Yin Yoga (PG) style. Paulie is asserting that his style of Yin Yoga is the "genuine" practice while Paul's style he calls "commercial" or "popular" Yin Yoga. This plays off the confusion Paulie created when he renamed his Taoist Yoga practice Yin Yoga. However, Yin Yoga (PG) is not a subset or precursor to Yin Yoga (Z). This is not to criticize Yin Yoga (Z), because it is indeed a wonderful practice, but to claim that Yin Yoga (PG) is somehow deficient because it is not Yin Yoga (Z) is specious.

Yin Yoga (PG) was never offered or created as a subset or introduction to Paulie's Taoist Yoga, and the fact that Paulie changed the name of his practice to the same name that Paul was using does not make Paul's practice subordinate to Paulie's. This would be akin to an Ashtanga teacher changing the name of her offering to "restorative yoga" and then criticizing restorative yoga because it doesn't have difficult postures, or because it is not based on vinyasa, or because it doesn't lead to further series. They are two very different practices with different intentions. So, too, for Yin Yoga (PG) and Yin Yoga (Z).

6) The final concern that "Yin Yoga is dead yoga" is just mean. I feel no need to explain how Yin Yoga (PG) is a living practice loved by many, but I will point out that dead people can't do Yin Yoga.

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[1] See his vimeo video Yin Yoga Flow by Master Zink.

Yin Yoga is not a complete practice

This concern generally takes the form of

> Yin Yoga is not a complete practice because life needs yin and yang, movement as well as stability. We shouldn't only be still.

I have no issue with this statement, but I do take issue with the implication that anyone was claiming that Yin Yoga is a complete practice. I know of no teacher who has claimed that Yin Yoga is a complete practice. It is not. No practice is.

You will not find any asana practice that is "complete." Physical well-being requires strength, endurance and mobility. One form of asana practice may be good at building strength, until a plateau is reached. At that point, where we are using only our body weight for resistance, the practice fails to be adequate for developing greater strength. Weight training may be required. Some asana practices are good at raising our heart rate, but again, a plateau can be reached and then this practice no longer serves to improve our health. Additional endurance training may be required. And, even if an asana practice did meet the physical needs for strength, endurance and mobility, well-being also includes mindfulness, presence and openness, as well as proper nutrition, sleep habits and so much more. No single yoga practice encompasses everything we need for full well-being.

Since no yoga practice is a complete practice, and since Yin Yoga is part of yoga, Yin Yoga is not a complete practice. There is no argument against that, but why single

out Yin Yoga for this criticism? All forms of yoga are incomplete practices. However, as part of a broader practice that does include training in strength and endurance, Yin Yoga can be a great practice to develop and maintain mobility and mindfulness.

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Yin is Chinese/Yoga is Indian—the two don't mix

One version of this concern was expressed as a rant on Amazon as follows (capitalization is from the original posting):

> The very act of adding the Chinese prefix of Yin to traditional INDIAN Yoga is an act of INSOLENT COMMERCIALISM, Utter IGNORANCE of the ancient INDIAN philosophies that gave rise to Yoga. Calling any variation of Yoga as YIN is as inauthentic and ILLEGITIMATE as a Ham and Pineapple "Pizza" would appear to a Neapolitan![1]

To quote Juliet from Shakespeare's famous play, "What's in a name? That which we call a rose, by any other name would smell as sweet." If you want to call Yin Yoga by any other name, it too would be as sweet.

Yin Yoga is yoga, in the Hatha yoga tradition of South Asia. Like all modern postural practices, it begins with a moment of arriving, incorporates asanas with attention and finishes with Shavasana. Yin Yoga is not a new practice. Holding poses for long periods of time in stillness are prescribed in the earliest Hatha yoga texts. (For more detail, you can read this summary in the YinYoga.com Forum.) However, as time went on, yoga asana practice became more and more yang in nature. One of the reasons that people are drawn to Yin Yoga is the balance it gives them to their yang, active lifestyle and other yoga practices. The actual practice of Yin Yoga is a return to the original form of Hatha asana practices.

The fact that the adjective "yin" was added to the name does not diminish the practice, but rather explains both parts of its history as well as its benefits. In terms of its history, it was through the teachings of Paulie Zink, Paul Grilley and Sarah Powers that yin postures were re-emphasized. No one invented this style of practice, but it was Paul and Sarah who really developed the art of sequencing yin postures into a full yoga practice, and they are the ones responsible for its current widespread adoption today. While Paulie Zink's practice, which he originally called Taoist Yoga, includes both active, Chinese martial arts training (yang), he also incorporated long-held static postures (yin). Paul Grilley, who studied with Paulie about once a week for several months, decided that the slow, floor-based postures could be cast into a complete yoga session. It was Sarah Powers who suggested that, since Paul was not offering the dynamic exercises that were part of Paulie's Taoist Yoga and only doing the slow, floor-based postures, they should call Paul's classes Yin Yoga. Thus the name was coined.

That is the history behind the name, but there are many reasons why the name is apt. As Paul's understanding of what happens energetically during a Yin Yoga practice grew as well as his understanding of the philosophy of yin and yang, thanks to his studies with Dr. Hiroshi Motoyama,[2] the term "yin" became more fitting. Yin is slow, passive, long-lasting, yielding, quiet and introspective, and a perfect adjective for the practice. There is no English word that would fit so well. Perhaps the Sanskrit word "tha" could have served as well, but few people know what that means. Yin and yang are well-known terms in the West.

Feel free to call this practice whatever you like—it will still feel as sweet.

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[1] See the November 3, 2019, book review by radome of *The Complete Guide to Yin Yoga, Second Edition* on Amazon.com.

[2] Dr. Motoyama was the inspiration for Paul Grilley, and later Sarah Powers, to delve deeper into the mysterious connection of the physical movements in yoga and the movement of energy through the subtle body. Sarah has described Dr. Motoyama as a yoga adept. More details on Dr. Motoyama can be found here.

Hot yin is bad

One version of this concern goes like this

> So don't fool yourself into thinking that just because the warmth in the room allows you to go deeper into the pose that your deeper tissues are receiving any benefit—that feel-good stretching sensation is probably just your muscles talking. That's the feedback we're used to listening to because we've been doing it for years. But if your intention is to work on increasing your flexibility by targeting the connective tissue—a worthy goal because it complements strengthening and stretching practices and improves overall joint health—then yin in a hot room is not the way to achieve that aim.

Part of this concern is valid and I have addressed this concern more fully in the article Hot Yin. It is certainly true that more stress will reach the tendons, ligaments

and deeper connective tissues when the body is cooler, but this does not mean that there is no benefit at all to stressing our tissues when the body is warm. Even with warm muscles, tendons and ligaments receive some stress. And, for many people, it is only when their body is warmed up that they can move deep enough into a posture to get a stress into their targeted tissues. In other words, some students need to be warm to get any sensation or stress.

We can generalize and say that the cooler the tissues, the more stress from a pose will be experienced by the deeper tissues; however, this does not mean that no benefit is gained by stressing a warm body in a yin way. When our tissues are warmed up their viscosity is decreased. A temperature increase in fascia of up to 105°F (~ 40°C) leads to reduced stiffness and more rapid elongation of the tissue, which in part can be attributed to higher extensibility of collagen.[1] In other words, it is easier to get longer when the tissues are warmer. Additionally, Gerald Pollack, a water scientist,[2] has looked at the thixotropic properties of our ground substance (water).[3] He has shown that constant stress or heat can turn the normal gel state (bulk, solid or thick state) of our water into a sol state (which is a more liquid, flowing state of water). We need both states at various times, so switching states is quite healthy. We don't want the ground substance to always be sol or always gel. Dr. Robert Schleip has noted that when the water in our fascia is in a more sol state, free radicals and other toxins can be more easily removed.[4]

Additionally, the benefits from Yin Yoga are not purely physical: students also benefit from the stillness the practice offers. The opportunity to come to an edge, become still and be with sensations is still available even in a hot room. Indeed, there may be more sensations to be aware of in a hot room. The opportunity to practice mindfulness is enhanced by remaining still for 3, 5 or 10 minutes at a time. The temperature of the room need not diminish the quality of the mindfulness practice. Indeed, this is one reason many people are adding hot yin to their yoga practice—it is their chance to calm the mind and practice presence.

Another benefit is the energetic stimulation available in Yin Yoga. Whenever an edge is felt, whenever a posture challenges us physically, tissues are being stressed. These stresses create mechanical, electrical and chemical signals that travel through the body and can change the quality of the tissues that transmit these signals. In the East, this is called prana or chi, which flows through nadis and meridians. The Daoists call the mechanical stimulation *acupressure*. Even in a hot room, the body can experience acupressure, which stimulates energies to flow.

While it is true that more physiological benefits may be available to the student who practices in a cooler environment, it is not true to say that practicing Yin Yoga in a warm room is not healthy or beneficial. The fact that hot yin has become popular attests to the fact that people are getting benefits from the practice. Can it be too much? Is there a danger that, in a hot room, the tissues may be stressed too much? Of course! Anything can be overdone. However, this is a risk for a hot yang yoga practice more than for a hot yin practice, because the yang yoga movements are

deeper and more dynamic than those used in Yin Yoga. Whether in a hot or cool room, students must always check in and see what their body is telling them, and respect those signals. Inherently, however, there is no reason to avoid hot yin—if you like being in a warm room, enjoy it! It is certainly better than not doing any yin at all.

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[1] See Werner Klinger, "Temperature Effects on Fascia," in R. Schleip, T. Findley, and P. Huijing (eds.), *Fascia: The Tensional Network of the Human Body* (London, UK: Churchill Livingstone, 2012), 421.

[2] Joel Cohen has an illustrative interview with Dr. Pollack on his website Selfhacked.

[3] *Thixotropic* means that fluids or gels can become less viscous with pressure or heat.

[4] "In healthy fascia, a large percentage of the extracellular water is in a state of bound water (as opposed to bulk water) where its behaviour can be characterized as that of a liquid crystal (Pollack, 2001). Much pathology – such as inflammatory conditions, edemae, or the increased accumulation of free radicals and other waste products – tends to go along with a shift towards a higher percentage of bulk water within the ground substance. Recent indications by Sommer and Zhu (2008) suggest that when local connective tissue gets squeezed like a sponge and subsequently rehydrated, some of the previous bulk water zones may then be replaced by bound water molecules, which could lead to a more healthy water constitution within the ground substance." Excerpted from Robert Schleip and Divo Gitta Müller, "Training principles for fascial connective tissues," *Journal of Bodywork & Movement Therapies* (2012): 1–13.

Yin Yoga is simply restorative yoga

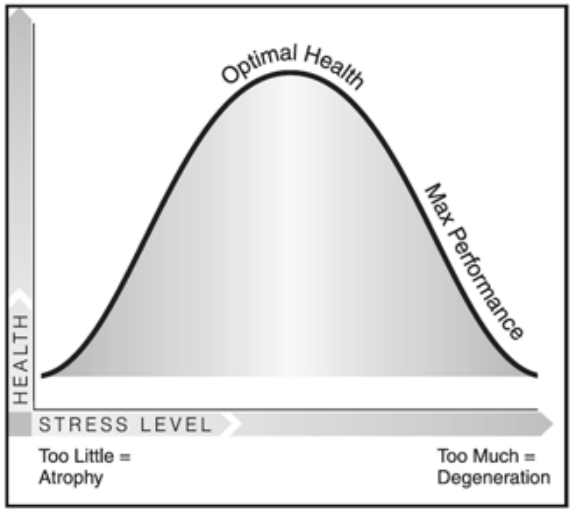
The nature of this concern is something like

> Yin Yoga is simply restorative yoga. It is so passive, supported and quiet. That may be fine, but—why bother? Why not just do restorative yoga if you want a peaceful practice?

The following response is extracted from a longer article, Yin Yoga or Restorative Yoga? Let's begin by defining our terms for clarity: Restorative yoga is a form of practice directed toward students who are injured, stressed or ill, who need a very gentle practice and who are looking to regain the quality of life that they used to have, but have lost. It involves the use of props (sometimes lots of props) to allow the body to feel totally supported, to allow the body to relax and release; long holds of these gentle postures, postures often selected to address specific challenges; and deep mental and visceral relaxation. This does sound very yin-like compared to the yang-like Hatha yoga practices that include dynamic movements, muscular engagement, active breath-work or energizing music. And it is yin in this respect, but is it Yin Yoga?

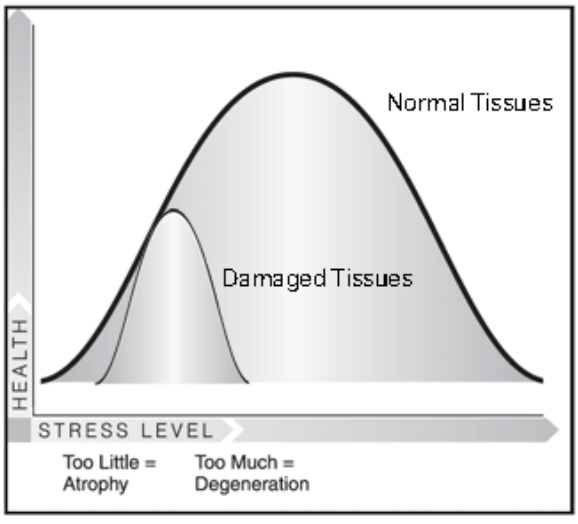
Yin Yoga, as a style of yoga popularized by Paul Grilley and Sarah Powers, is not intended to be restorative yoga: it encompasses long-held, static stresses of the deep connective tissues, allowing them to be remodeled. It may include props and it does

include long holds and mindfully reducing stress, but it is not intended to heal broken bodies in the way that restorative yoga does. Now, all Hatha yogas can help heal broken bodies, but we can think of the main intention of Yin Yoga to be maintaining the current state of health or improving it to optimal levels. In short—and it is always dangerous to make short dogmatic definitions, but here goes—restorative yoga takes an unhealthy body and brings it (hopefully) back to normal, while Yin Yoga takes a healthy body and brings it up to optimum. So you see—it is a question of degree.



When the intention of a yoga practice is to achieve optimal health, a question has to be asked as to how deep to stress the body. The answer is found in the Goldilocks' curve, as shown in this graphic: if too little stress is applied, the tissues atrophy. If too much stress is applied, the tissues degenerate. For some students the intention is not optimal health but rather optimal performance: they will want to push the poses to the maximum of their physical and emotional limits. This may be appropriate for dancers, gymnasts and athletes whose jobs require maximum performance, but they should be aware that their choice comes at a cost: maximum performance is obtained at the expense of optimal health. Talk to any retired dancer, gymnast or athlete, and you may find some of the most broken bodies around.

All tissues need stress! This fact is one that confuses the discussion of using yoga as therapy. A student who suffers osteoporosis in her lumbar spine may have been told to not stress her lower back at all, to make sure she doesn't break her spine. This advice is offered with the best of intentions, but it may not be the best advice, because, if there is absolutely no stress on the spine, the tissues will continue to atrophy. But clearly, too much stress will degenerate the bones, leading to worse problems. So what to do? In these cases it is best to think of the Goldilocks' curve as becoming narrower and shifted to the left.



Notice this second graphic: the area of safe stress for damaged tissues is very tiny and there is a smaller margin of error between too little and too much. The point is that all tissues need stress,

but with injury or illness the proper amount of that stress falls into a very narrow band. It is easy to go too far and hurt the student, but it is equally too easy to say, "don't do anything," which also hurts the student. The student coming to a Yin Yoga class may be totally justified in wanting to take this class. A restorative class may not work for them: it may be too gentle, they may only have one area that needs care but the rest of their body wants a regular workout, or they do want to work into the damaged connective tissues and can only get that in a Yin Yoga class.

So we are back to our basic question: is Yin Yoga the same as restorative yoga? The answer is "No!" Restorative yoga is a very gentle practice that does not try to stress the tissues deeply and does not take the student outside her normal comfort zone. Yin Yoga is simple, but simple does not mean easy: it will challenge the student and will stress the tissues. But the answer is also "Yes!" Yin Yoga, when applied carefully and conscientiously, can apply an appropriate Goldilocks level of stress to damaged tissues and help them recover; thus it can be considered restorative yoga. But so can many other forms of yoga.

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