

YIN YOGA: A NEUROSCIENTIFIC PERSPECTIVE



Within the Yin Yoga community, much focus has been placed on the role of connective tissue, with debates abound on whether it is really possible to lengthen fascia or to release fascial adhesions. As an osteopath who is fascinated with pain science, I have often wondered at the relative lack of attention placed on the more responsive signalling and coordinating nervous system which forms the basis of how we move and feel in the practice of Yin Yoga. As such, I would like to share my understanding of the principles of Yin Yoga through a neural lens.

Whenever we place the body into a particular shape of a yoga pose and hold it for at least 3 to 5 minutes, we are providing our nervous system with a certain stimulus. In the target areas of each pose, our soft tissues and joints are either subjected to a tensile stress (i.e. stretch) or compression (i.e. pressure). Such mechanical stimuli will be detected by the sensory nerves surrounding these tissues, and nerve signals will be relayed to the spinal cord and brain for processing. The muscle spindles will detect a change in muscle length, and the Golgi receptors in the tendons will detect a change in muscle tension. In addition, sensory nerve endings in joint ligaments and capsules will also convey information about joint range and position to the central nervous system. All this incoming sensory signals provide us with *proprioception*, the ability to sense our body parts and movement in space, even when our eyes are closed. With practice, we no longer have to look at ourselves in the mirror when we assume a Yin pose: we can just feel our bodies assuming that particular shape.

THE FIRST PRINCIPLE OF YIN YOGA IS TO COME TO AN APPROPRIATE EDGE, the balance point between comfort and challenge. This means that we try not to push our bodies into the maximum range available to us in any given position. The edge is where the first resistance to stretch or pressure is felt in our bodies. This resistance can be understood as a spontaneous protective response from our nervous system, in which the stretch reflex kicks in to protect our tissues from potential injury through going too far. Yin Yoga teaches us to respect this neural reflex, to work gently with our bodies instead of imposing any fixed aesthetic ideals on ourselves.

When we arrange our body structure into a particular yoga pose and pause at the edge of resistance, this is usually where we start to feel some dull pain. Or perhaps one may describe it as an acceptable discomfort. A neural process known as *nociception* has just occurred. This is where the danger-sensing nerves in our tissues register the mechanical stimuli of stretch and pressure, and convey this input via nerve signals to the spinal cord and brain. A complex and fascinating process involving filtering, comparing and conditioning occurs in the nervous system, eventually emerging as our conscious experience of the pose as pleasantly achy or bordering on pain. This then invites us to adjust our bodies accordingly, to move further into or back away from the edge.

THE SECOND PRINCIPLE OF YIN YOGA INVITES US TO COMMIT TO PHYSICAL (AND MENTAL) STILLNESS, to refrain from unnecessary fidgeting. Many people live within a competitive consumerist culture, conditioned to orient our personal pursuits on getting and having more. So our autonomic nervous system tends to be on sympathetic over-drive, in a constant 'fight or flight' response. Chronic stress and the frequent release of stress hormones, such as cortisol and noradrenaline, have the potential of making our danger-sensing nerves fire more readily. This increases *nociception* and over time could contribute to a lowering of our pain-threshold, making our bodies more sensitive to relatively mild stimulus. In other words, we may suffer more aches and pains, get overwhelmed or fatigued more easily and find it more difficult to remain still.

Thankfully, due to *neuroplasticity*, the nervous system is not hard-wired and can be re-conditioned to become more receptive to stillness. This not achieved by forcing ourselves to remain locked in a pose, as it will only produce more stress and tension. Instead, we try to cultivate the relaxation response, the parasympathetic component of the autonomic nervous system. One effective way of doing so is to slow down or lengthen the breath, especially the exhalation. By becoming conscious of where we feel stuck and allowing ourselves to let go of any habitual holding patterns, we lessen the guarding response of the stretch reflex, facilitating more blood flow to feed our sensory nerves. A well-fed nerve is one that is a lot less likely to complain!

THE THIRD PRINCIPLE OF YIN YOGA IS ITS MAGIC INGREDIENT: TIME. A typical Yin pose is held for about 3 to 5 minutes, and within that time frame the nervous system is given ample opportunity to process all the sensory stimuli to form and refine new connections. We are encouraged to stay connected with our breath and the sensations we are feeling within ourselves. Attuning to the internal landscape of our bodies with conscious awareness is known as *interoception*. This is an essential life skill that can be practised and improved upon over time. Internalising our attention, being mindful of the present moment as it is embodied within the container of the pose is what gives Yin Yoga its meditative aspect.

As long as the first principle of respecting our edge is attended to, what tends to happen is that the initial discomfort gradually becomes more manageable, and pleasant sensations may even begin to arise as the pose is held over the next few minutes. This experience is likely mediated by the brain with its release of feel-good chemicals such as endorphin and dopamine. Hence, the nervous system is capable of dampening sensations of discomfort via descending modulation, a top-down process by the brain inhibiting incoming messages from the tissues. The ever-learning nervous system can be trained or conditioned to accommodate discomfort, building our capacity for equanimity in the face of challenges.

For me as a teacher and student of Yin Yoga, the most valuable aspect of its practice is building resilience to stress through neural re-education. It is as if each Yin pose we offer to the body is a Zen Koan for our nervous system to process and fine-tune itself, not to be answered intellectually but wordlessly through direct experience. All we need to do is to set things up as safely as we can and allow this magic to happen. How wonderful!

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