

Science for the Yoga Therapist

Pain and Yoga Therapy: Part 1

By Neil Pearson, Lisa Pearson, and Erin Byron

The recurrent theme at SYTAR 2019, celebrating IAYT's 30th anniversary, was "standing on the shoulders of those who came before us." This important series on pain is one way our generation can provide broad, strong shoulders for the next. The pain crisis today calls for competent and culturally relevant care. As yoga therapists, we are uniquely positioned to extend that care to our suffering world, but only if we are, indeed, competent and relevant. IAYT is currently seated at a number of "tables of opportunity" in the United States and globally as a result of the work of others before us. This includes IAYT being part of the Comprehensive Integrative Pain Management Policy Congress of over 75 of the top stakeholders in pain care; the work groups for the Integrative Health Policy Consortium (www.ihpc.org), which informs policy and legislators; and the Global Wellness Summit's Initiative on Yoga Therapy (globalwellnessinstitute.org/initiatives/yoga-therapy/).

To fulfill our collective mission of making yoga a recognized and respected profession, we can't rely on our representatives' pain literacy alone. As professionals, we need to increase our individual competency in our respective networks. So with that charge in mind,

"Atha yoganushasanam" (Patanjali's Yoga Sutra 1.1)—"Sit down. Pay attention. Our work is this."

Because pain is a conscious, lived experience, we need to understand it as more than just a biological mechanism: It's an adaptable, adapting physiological process. We can explore pain from medical, biomechanical, psychoemotional, social, and spiritual perspectives. This series prompts yoga therapists to update their toolkits with knowledge drawn from the current biological, psychological, and yogic views of pain.

—Matthew Taylor

Chronic pain is costly. To society, the financial burden is greater than that of treating people with cancer, heart diseases, and diabetes combined. To the individual, the cost can include loss of relationships, employment, and functionality; social isolation; and even suicide. Pain and persistent pain are topics of considerable importance to yoga therapists. Regardless of whether the individual attributes pain to the body, the mind, or the spirit, more people are seeking out yoga as a way to help themselves with what they are experiencing. Consequently, we yoga therapists need to explore the complexities of pain, the lived experience of pain, and current practices and trends in pain care through continuing education and pain-specific training programs. Western medicine is

important for many chronic pain conditions, yet yoga therapists can offer both a crucial integrated body-mind-spirit complement and a pathway to continued care in patients' communities after initial intensive medical interventions.

What Is Pain?

The International Association for the Study of Pain (IASP) defines pain as "an unpleasant sensory and emotional experience, associated with actual or potential tissue damage or described in terms of such damage." This definition guides us to some important details about pain neurobiology and the complex multifaceted nature of pain. But first, some caveats.

First, pain is not a strong predictor of tissue damage¹ or of the risk of injury. A well-known study by Hannan, et al. in 2000, entitled "Analysis of the Discordance Between Radiographic Changes and Knee Pain in Osteoarthritis of the Knee," revealed individuals with severe osteoarthritic knee pain may have only mild cartilage damage, whereas some people with more joint changes report very little pain. Apparently, the longer the tissue issues exist or pain persists, the lower the correlation between pain levels and tissue health. Second, painful movement does not equate with tissue damage. Mechanical deformation of the body tissues excites nociceptive neurons *prior* to tissue injury,² so the first increase in pain we experience with movement is never an indicator of tissue damage.

Third, and of specific bearing to yoga therapy, the quality of pain described by a client may suggest that movement is causing damage, yet such details are not necessarily an accurate indicator of what is happening inside the body.³ Unlike the skin, which has sensory receptors to differentiate various types of damage or nociceptive inputs,⁴ subdermal nociceptive information essentially travels to the brain without such differentiating information attached to it. Current understanding suggests that some mechanisms of the brain determine the quality of the pain, in part to assess the level of danger and the need to change behavior.⁵

With an intact nervous system, pain is both a sensory and emotional experience. When nociceptive neurons respond to potentially dangerous mechanical, thermal, or chemical stimuli, signals can excite both sensory and emotional mechanisms of the brain practically simultaneously.⁶ The network of brain activity associated with pain, referred to as a connectome,⁷ includes many areas of the brain,⁴ such as the insular cortices, which integrate sensory and emotional processing,⁸ giving pain its unpleasant sensory *and* emotional qualities.

What Is Chronic Pain?

The IASP Task Force for the Classification of Chronic Pain defines chronic pain as "pain in 1 or more anatomic regions that persists or recurs for longer than 3 months and is associated with significant emotional distress or significant functional disability (interference with activities of daily life and participation in social roles)."

After injury or surgery, even when the tissue does not return to its previous state, pain usually resolves.⁹ When pain persists, there

can be an increase in nociceptive inputs from peripheral nerves, a decrease in descending inhibition of nociceptive signalling, alterations in central processing, and/or any combination of these adaptations. Neuroplastic changes related to learning and long-term potentiation¹⁰ can occur in peripheral neurons, the spinal cord, and the brain. Concurrently, individuals become less active. As such, in chronic pain not only are the tissues less tolerant of mechanical loading, but the protective systems are sensitized.¹¹ These sensitive protective mechanisms provide a greater buffer between increased pain and tissue damage.¹¹ Yet for people in pain, it is virtually impossible to discern pain during movement as arising from a sensitized nervous system versus from damage; without effective pain education, they will likely attribute increased pain to tissue damage.



The sensation of pain is one of our bodies' many protective mechanisms. Others include stiffness; body tension; weakness; and changes in immune, cognitive, endocrine, and autonomic system functioning. It is tempting to focus on pain, though, because it is the protective mechanism that demands so much of our attention. Yet none of these mechanisms on their own can accurately tell us of the health of our tissues, or how much to move—especially when the pain persists, creating an ever-larger buffer between the protective response and tissue damage.⁷

Common Pain Myths

Quite a lot of our learned thinking about pain requires reconceptualization, bearing in mind certain points:

- The intensity of pain, its location, and/or its quality are not accurate indicators of tissue damage or health.
- As pain is not necessarily a tissue health meter, it is not an accurate indicator of how much to move, exercise, or stretch.
- Pain is highly modulated by a wide variety of variables,¹² which gives all of us the ability to influence pain in some ways.
- Pain follows many of the rules of perceptual processes. It changes with learning, is influenced by context and expectations, and some of its biological mechanisms decline with age.
- Aging is not a sufficient basis for increased pain.¹³

Pain involves far more than nerves, immune cells, and other biological processes, and even after decades of study, pain neurobiology doesn't explain everything.

The Psychological View of Pain

Pain is a sensation and an emotion. Like these two phenomena separately, its experience and expression vary across age, race, socioeconomic status, and gender.^{12,14-16} Yet, due to psychophysiological complexities associated with pain, there is also a large range of subjective experience even within homogenous populations.

There are multifaceted reasons why this may be. Consistently, psychological factors such as depression and pain catastrophizing are related to people reporting higher levels of pain.¹⁷ Several human genes modify the risk of developing chronic pain,¹⁸ and phenotypic markers include pain amplification.¹⁹ Persistent pain from musculoskeletal conditions and stressed emotions share neural circuitry,²⁰ including the prefrontal cortex, amygdala, insula, nucleus accumbens, posterior cingulate cortex, and anterior cingulate cortex (ACC). Nociceptive information being processed along with emotions in the insula can transform magnitude of pain, accounting for some of the disparities between tissue health and pain levels.²¹

Emotions also alter how pain is processed, at least in part via ACC activity.²⁰ Whether attributed to physical injury or social rejection, pain is associated with activity in similar brain regions, including the ACC and the right ventral prefrontal cortex.^{22,23} In a 2013 paper, "Beyond Metaphor: Contrasting Mechanisms of Social and Physical Pain," Giandomenico Ianetti et al. referred to this activity as "the saliency network" and found that during acute pain, individuals can differentiate social and physical pain, even when an fMRI shows identical networks firing. When pain persists, though, its origin is not always easily differentiated by the individual experiencing it.

Social support is also associated with differences in pain, as seen in studies on postoperative pain.²⁴ Patients who feel supported experience less pain and rely less on medication.^{25,26} Conversely, not all support is helpful: Patients with solicitous spouses report increased pain.²⁷

Psychosocial Factors Predict Persisting Pain

- Acute emotional response at the time of a motor vehicle collision is the strongest predictor for persisting pain.²²
- Fear of surgery is a predictor of long-term postoperative pain.²³
- Low job satisfaction consistently forecasts chronic pain after work injury.²⁸
- Childhood trauma is a harbinger of future pain disorders.²⁹
- Perceived injustice is a predictor for worse pain outcomes.³⁰
- Anger is linked to worse pain after injury and surgery.³¹
- Pain catastrophizing prior to surgery tends to lead to greater pain³² and opioid use.³³
- Preoperative pain catastrophizing is a predictor of poorer postsurgical functioning³⁴ and delayed early recovery.³⁵

Psychosocial Factors Protect Against Persisting Pain

- Optimism is consistently shown to offer protective effects against chronic pain after injury or surgery.^{23,36}
- Self-efficacy, goal importance, and psychological resiliency are protective against pain and disability.³⁷⁻³⁹

Both acute pain and persisting pain can be associated with intense cognitive and emotional experiences. This should not be misunderstood as informing us that pain is purely a psychological issue requiring only interventions addressing the psyche. Pain affects every aspect of our existence, whether it is acute or persistent, no matter what we think of its origin. Additionally, because we can influence pain through every aspect of our existence, we are at times best served by integrating these biological and psychosocial views of pain through perspectives based on yoga.

A Yogic View of Pain

Nearly all of us associate pain with there being something wrong with our physical body. This conditioning is pervasive, putting our focus primarily on the physical as the cause of our “suffering with persisting pain.” Interestingly, no ancient yoga texts comment strictly on painful sensations in the physical body. Rather, yoga discusses pain and suffering as related to issues of the heart/mind (*chitta*).⁴⁰

The yogic perspective sees pain and suffering as synonymous. Nociceptive inputs were not discussed, but if they had been, there probably would have been no differentiation of the pain arising from this versus pain from emotional turmoil or spiritual angst.

In the Yoga Sutras (II.3–9), Patanjali writes of the *kleshas*, the five causes of suffering. The *kleshas* are helpful in understanding the yogic view of pain.

1. **Avidya (ignorance or forgetfulness).** Yoga reminds us that our true nature is whole and complete (Isha Upanishad). When we believe that we are our body-mind and/or when we overidentify with our emotions, thoughts, and feelings, we forget our essence as spirit (*Atman*) and allow suffering to enter and overwhelm us.
2. **Asmita (overidentification with the self).** When we live with persisting pain we can overidentify with the pain itself. Pain becomes our personality. We give it power over every aspect of our being. Our pain can easily become an aggressive bully telling us what we can and can't do.
3. **Raga (attachment).** When pain persists, we can actually become attached to our suffering. This attachment is revealed in our “story” of suffering. The hows, whats, and whys of our pain become our attachments to what we feel is outside of our control and therefore may keep us perpetually in the cycle of suffering.
4. **Dvesha (aversion).** Nobody wants pain. In our aversion to pain we may suppress it, pushing through our limitations and doing our best to not listen to our body/mind/spirit when it whispers warnings or declares that danger is near. Aversion to the “painful body” can even lead to distortions of body awareness and body schema. In the end, aversions become the catalyst to forgetfulness, and so the whole cycle continues.
5. **Abhinivesha (fear).** This *klesha* is often referred to as “fear of death” or “clinging to life.” Underlying this fear are the fear of not living the life we dreamt possible, fear of not getting what we want, and fear of not being who we wish to be. Pain can halt our dreams and change our course in life. Fear is a big part of pain. We lose so much, and we are afraid of losing even more when pain persists. The cycle of pain and fear creates even more suffering. An example of *abhinivesha* is our belief that pain should and will increase with age.

In a 2005 seminar, Goswami Kriyananda taught that “the purpose of yoga is to relieve our suffering and to remember our true nature.” Swami Satchidananda, in his 1988 book *The Living Gita*, discussed how karma interacts with pain and suffering. Our past affects our present. With every cause there is an effect. In the teachings of this translation of the Bhagavad Gita, Krishna tells us we are “bound by our past actions which arose from our own nature. Therefore, you must do that which, out of delusion, you still may not wish to do.”

Karma exists to create an opportunity to become more aware of our true nature. Pain can guide us to live our lives in different ways—at best, ways in which we can better come to know ourselves as *Atman*. Pain as karma exists to compel us to reside in the heart of unconditional love. Without knowing this connection between pain and karma, our life on Earth may become confused and/or a battle ground.⁴¹

Pain: A Partial Conclusion

Poets and sages have discussed pain for millennia. Along the way, some believed it to be a phenomenon related to religious belief and action. More recently, we began to discuss pain from a psychological perspective before shifting again to focus on the biological processes involved. New voices are rising now that propose an integration of past and present views. The demand is that pain must be discussed from an integrated biopsychosocial-spiritual perspective.

A deeper understanding of pain can lead yoga therapists to greater curiosity and to the necessary tolerance of uncertainty. Both are typically lacking in Western allopathic processes, and yet both are important for compassionate and successful care. No matter where we start, we must leave room to evolve our understanding of pain.

Terms to Know

Central processing: the central nervous system (spinal cord and brain) receives and integrates information from all of the body's interoceptive and exteroceptive organs, as well as from the autonomic and enteric nervous systems (including immune, endocrine, and vascular systems). Nociceptive signals are processed within a complex internal and external environment.

Nociception: the process of neurons responding to noxious stimuli. *Note:* Nociceptive signals from the body may or may not produce pain. Nociception often produces complex protective responses including pain, but it might also be associated with changes in blood pressure, breath pattern, cognition, muscle tension, or reflexes; pain is not necessarily produced by nociception.

Sensitization: increased responsiveness/sensitivity of nociceptive neurons. *Note:* The individual, a specific aspect of the protective mechanisms, and/or the neurons may become more responsive to noxious stimuli and may respond to innocuous stimuli as if they were noxious/dangerous.

Visit www.iasp-pain.org/terminology for definitions of these and other pain-related terms.

Part 2 of this article will explore the multidimensional lived experience of pain. Then in Part 3, we'll delve into the specifics of how yoga therapists can help. **YTT**

Editor's note: Over the past decade, IAYT has published a number of resources on pain and related subjects, including the following. Access them at iayt.org > Resources > Understanding Pain.

From Yoga Therapy Today:

- Neil Pearson. "Know Pain? A Brief Guide to Understanding Pain for Yoga Therapists." *Summer 2012*.
- Neil Pearson. "Neurobiology of Pain." *Spring 2016*.
- Matt Erb & Marlysa Sullivan. "I Shall Please—Placebo & Yoga Therapy." *Spring 2017*.
- Timothy J. Avery. "Yoga and PTSD: A Primer on Symptoms and Potential Mechanisms of Change." *Winter 2018*.
- Neil Pearson. "Interoception: A Nuanced Look Within." *Winter 2019*.

From the International Journal of Yoga Therapy:

- Neil Pearson. "Yoga for People in Pain." *2008(18)*.
- Zena Kelly. "Is Yoga an Effective Treatment for Low Back Pain: A Research Review." *2009(19)*.
- Neil Pearson. "Yoga and Chronic Low Back Pain." *2010(20)*.
- James W. Carson, et al. "Mindful Yoga Pilot Study Shows Modulation of Abnormal Pain Processing in Fibromyalgia Patients." *2016(26)*.

Consider reading or revisiting these articles to bolster your understanding of this vital topic. Hopefully the intersections between science, psychology, and yoga will stimulate new educational paths.



Neil Pearson, PT, MSc(RHBS), BA-BPHE, C-IAYT, E-RYT 500, is also a professor, author, and a leader in integrating an evolving understanding of pain and people in pain into physical therapy and yoga therapy. Co-editor of *Yoga and Science in Pain Care*, Neil also leads a professional distance pain care mentorship program. www.paincareu.com



Lisa Pearson (Swami Swarupananda), C-IAYT, E-RYT 500, is an ordained Kriya Yoga swami, the co-director of *Pain Care U yoga*, and faculty for *Inner Peace Yoga Therapy*. Through understanding the lived experience of pain and from her experiences as a studio owner and program developer, she offers sadhana guidance and mentoring. www.paincareu.com swamilisa@gmail.com



Erin Byron, MA, C-IAYT, is a registered psychotherapist who has authored or coauthored five books in the field of mental health and yoga. She is a founder of *Comprehensive Yoga Therapist Training* and offers professional supervision to yoga therapists. Erin presents trainings and workshops on yoga for trauma, depression, and anxiety. www.ErinByron.com

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