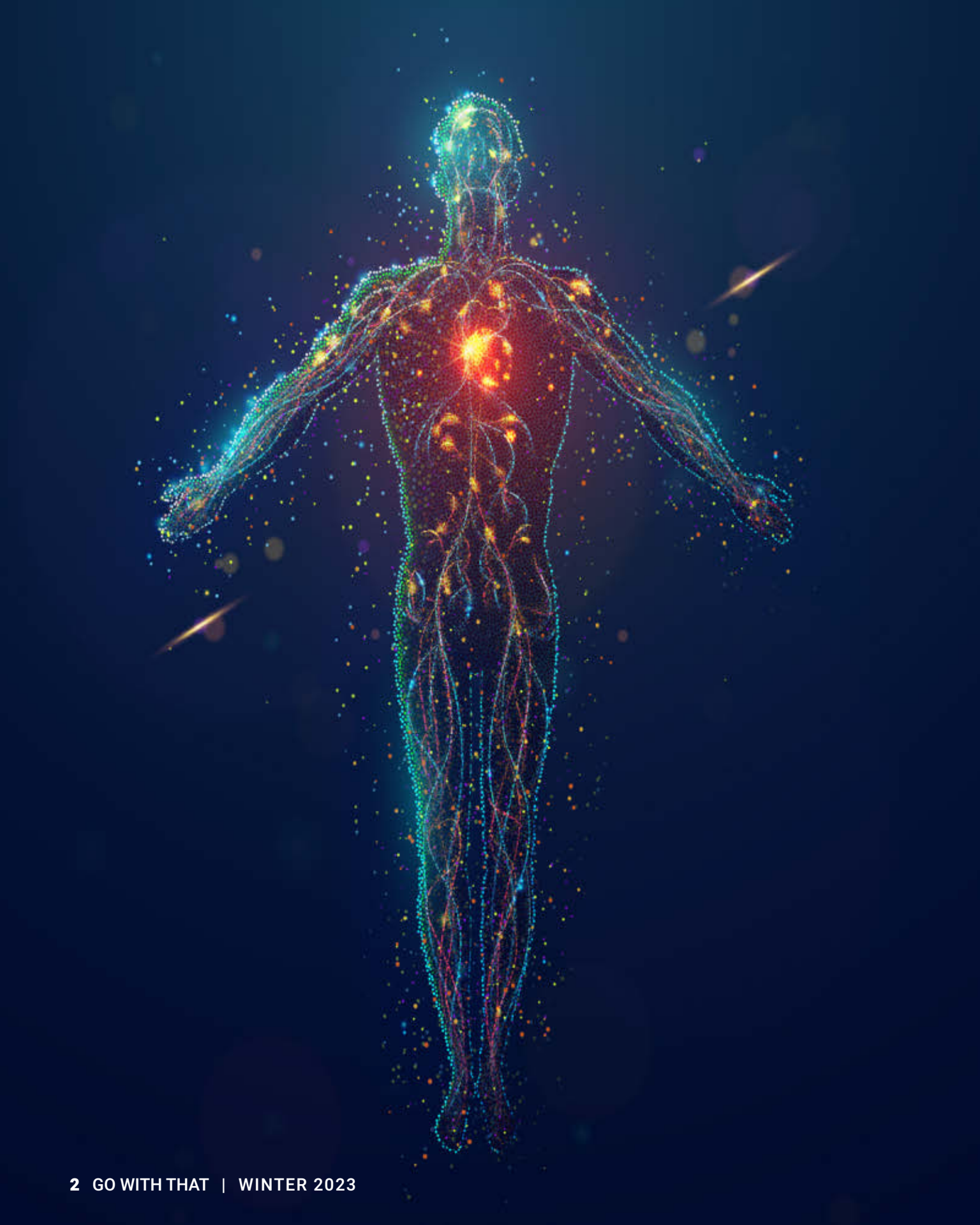

EMDR and Somatic Psychology for Chronic Pain and Illness

By Arielle Schwartz, Ph.D.

There is an undeniable link between stress and physical symptoms, such as headaches, stomachaches, and the common cold. However, this relationship is amplified when there is a history of chronic stress and trauma. These historical events contribute to imbalances in the autonomic nervous system that underlie many chronic illness and pain conditions. Chronic stress and the corresponding activation of the sympathetic nervous system is associated with high levels of cortisol, which has been linked to health consequences, such as elevated blood sugar, increased blood pressure, greater risks for heart disease, and suppressed immunity (Scaer, 2014). In contrast, unresolved post-traumatic stress disorder (PTSD) can lead to an unregulated parasympathetic response in which cortisol levels are suppressed for extended periods. This pattern is associated with higher rates of inflammation, autoimmune conditions, chronic pain, fibromyalgia, and digestive problems (Bergmann, 2012; Boscarino, 2004; Vachon-Presseau et al., 2013).

The key definition of chronic pain and illness is the ongoing and repeated nature of the condition. In some cases, there is a known physical etiology of the symptoms, such as a virus, structural imbalance, or autoimmune condition. In other cases, there is no known physiological cause of symptoms. And in some situations, the individual no longer has an infection or a physical cause; however, the pain and symptoms remain. In these cases, chronic pain is better understood to be a maladaptive memory maintained by neuromuscular pathways that have been repeatedly myelinated, so they tend to repeat on autopilot. These chronic health conditions often become a vicious cycle in which the body is now sending ongoing cues of threat that are bombarding the nervous system from the inside. For example, slight discomfort in the low back can lead to a fear response that manifests as gripping, tension, negative thinking, or feelings of helplessness that can lead to a downward spiral in which symptoms continue to worsen. Clients who suffer from chronic pain and illness as part of their sequelae of trauma-related symptoms often benefit from a holistic, body-centered approach to care that allows us to compassionately attend to their physical distress as part of the EMDR therapy process.

ADVERSE CHILDHOOD EXPERIENCES

The link between stress, trauma, and health was brought to light in the late 1990s through the Adverse Life Experiences (ACEs) study,

providing groundbreaking evidence of the undeniable relationship between developmental trauma and illness (Felitti et al., 1998). Felitti's research, which involved the collaborative efforts of the Centers for Disease Control (CDC) and Kaiser Permanente, investigated the impact of ACEs on the long-term health and wellness of over 17,000 participants. Two-thirds of the participants had at least one ACE, more than 20 percent had three or more ACE factors, and when participants had four or more ACEs, they were at an increased risk for heart disease, cancer, drug abuse, diabetes, stroke, obesity, depression, and suicidality. When individuals had six or more ACEs, their life expectancy decreased by almost 20 years.

More recently, this study was replicated through a systematic meta-analysis, which included over 20 million participants, indicating that childhood adversity is a major contributing factor to early mortality (Grummitt et al., 2021). In our post-pandemic world, many clients have had to cope with loss, grief, trauma, and the toll that chronic stress can have on their bodies. More recently, it has been discussed that individuals who experienced at least one childhood traumatic event are three-fold more likely to develop long-haul COVID syndrome (van den Hurk, et al., 2022). These post-COVID symptoms have deepened our understanding of the relationship between historical trauma, pain, and illness.

The racial reckoning that has occurred since 2020 has helped the field of psychology to look beyond the traditional ACEs and recognize the toll that adverse community environments and culturally-based experiences have on the developing child. Factors include poverty, racialized trauma, discrimination due to sexual orientation or gender, placement in foster care, separation from a caregiver due to deportation or immigration, and experiencing or witnessing community violence (Bernard et al., 2021). In addition, transgenerational and collective traumas, such as oppression, racism, colonization, genocide, enslavement, and war, are carried within the minds and bodies of individuals who have either been directly impacted by or are descendants of relatives who have suffered from these events (Hirschberger, 2018). Collective and transgenerational traumas are passed down through epigenetic factors and relational experiences. Epigenetic modifications in how the body metabolizes cortisol can lead to a greater vulnerability to the development of anxiety, depression, and post-traumatic stress.

TRAUMA AND THE BRAIN

Memories are stored in the brain as interconnected neural networks. A neural network is a group of interconnected neurons in the brain, and according to Hebb's law, what fires together, wires together (Siegel, 1999). As relevant to traumatic memories, the sensory elements of traumatic events, such as images, sounds, and smells, are linked to the associated physiological state of fright, terror, or, in some cases, shut down and collapse. Even in the absence of current threats, when we are experiencing a similar psychophysiological arousal state, associated memories with a similar negative valence and felt sense are more likely to emerge to conscious awareness. For example, when individuals with post-traumatic stress are experiencing flashbacks, they might find it more difficult to recall times when they felt empowered, resourced, or connected to others. This can be thought of as a form of state-dependent memory. Likewise, chronic pain is a maladaptive neural network that mirrors traumatic memory neural networks (Grant, 2016). When these neural networks are activated, it can be more difficult to remain cognitively and emotionally flexible (Bergman 2012).

Traditional PTSD is associated with increased limbic system arousal and decreased functioning within upper brain centers, such as the prefrontal cortex (Harricharan, McKinnon, & Lanius, 2021). These individuals may be more prone to feeling emotionally flooded with a reduced capacity to objectively observe their experience, reflect upon the past, or plan for the future. In contrast, the dissociative subtype of PTSD is marked by an overreliance on upper brain activity with a reduced capacity to access emotions and the sensory components of memories (Lanius et al., 2012). When we suppress awareness of our sensations, it can lead us to sustain low levels of muscle contraction without realizing it. For example, when sitting too long at your computer, you might disconnect from your somatic experience and only later realize that your neck has tensed or your foot has fallen asleep. While these are relatively common experiences, long-term suppression of sensations and movement can worsen chronic pain because we are less likely to notice the somatic signals that help us respond to discomfort in a beneficial way (Fogel, 2009). Our awareness of interoceptive cues helps us to recognize when we need to shift how we are sitting or reminds us to take a deep breath, which facilitates our well-being.

Trauma interferes with the integration between the left and right hemispheres of the brain. Developmental trauma interferes with the development of the corpus callosum, impairing the integration between

the left and right hemispheres of the brain (Teicher & Samson, 2016). The right hemisphere is specialized for processing emotions and identifying threats, and the left hemisphere houses Broca's area, which is involved with language and speech (Van der Kolk, 2015). When the two sides of the brain are not functioning as a cohesive unit, it becomes increasingly difficult for individuals to create a coherent narrative about their life experiences, leading to a disorganized sense of self. Over time lack of hemispheric integration encapsulates the traumatic sensory information within the right brain. When functioning in isolation, the left hemisphere is more likely to isolate parts from the whole in a way that can create unnecessary analytical distance from our emotions, leading us to feel rigid and cut off from ourselves or others.

TRAUMA AND THE BODY

Relationally, trauma gets passed down by parents with unresolved childhood trauma, which manifests as dysregulated physiology and emotions. When parents cannot provide a coherent narrative about their past, they may have reduced capacity to be mindful about the way their emotions and actions impact their children (Siegel & Bryson, 2021). This can lead children to feel responsible for their parents' pain, suppress their emotions to avoid causing a parent more pain, or feel confused about the source of their distressing emotions. Since children are right-brain dominant, these trauma legacies tend to be passed down through the perception and assimilation of facial expressions, postures, gestures, voice tone, interactional styles, movement patterns, emotions, and behaviors.

These experiences are carried as implicit memories in the form of motor patterns, sensations, emotions, and physiological arousal states. For example, we may have been conditioned to make ourselves small, hunch our shoulders, or avoid eye contact because this is how we have been taught to keep ourselves safe. The presence of adverse childhood, community, cultural, and collective traumas can lead to devastating mental, emotional, and physical health consequences if left unaddressed. Importantly, feelings of rejection, being excluded, times of isolation, or any loss of social value is processed by the same neural circuitry that is linked to physical pain (Eisenberger, 2012).

BRAIN INTEGRATION AND TRAUMA RECOVERY

Brain integration allows us to contextualize the individual events of our lives. The left brain uses language as a primary tool of understanding the world; however, when integrated with the right hemisphere, we are better able to reflect upon our emotions and sensations to develop more realistic predictions for our future. Communication between the left and right hemispheres is necessary for creativity and allows us to apply new information in a meaningful way within our lives (McGilchrist, 2009). Because many of us have grown up in cultures that emphasize left hemisphere and upper-brain processing, we often need right-hemisphere

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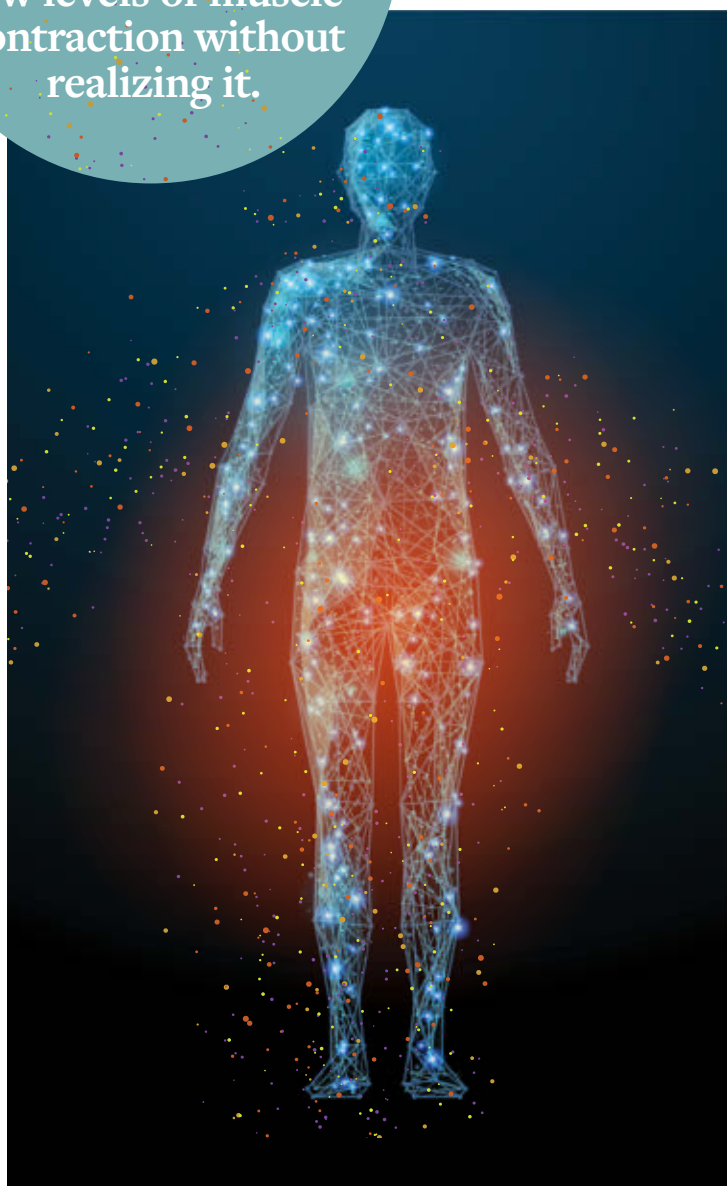
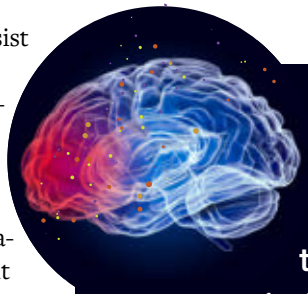


and sensory-based interventions to facilitate balance.

Psychotherapy interventions assist with brain integration by helping clients access their sensory experience and emotions while also engaging in reflective processes that allow them to mindfully narrate their experience. Brain integration allows us to reflect on difficult or traumatic experiences with greater objectivity and compassion. We are better able to find creative solutions to stuck stories. Brain integration is central to Eye Movement Desensitization and Reprocessing (EMDR) therapy. It has been suggested that rhythmic, bilateral eye movements facilitate communication across the corpus callosum in a manner that mimics REM sleep, which assists with memory consolidation (Stickgold, 2002). Consolidation integrates a singular experience into the ongoing sense of self in the world by linking a singular event into the association cortex of the brain, which helps us to create a coherent sense of self across time (Siegel, 2001).

EMDR is also delivered with other forms of bilateral stimulation, including self-tapping with the hands-on opposite shoulders, listening to alternating sounds in headphones, and holding pulsers in the hands. Additional working mechanisms of bilateral stimulation suggest that EMDR relies upon dual attention, which taxes working memory. This, in turn, interrupts the client's ability to focus on the disturbances associated with the event and can reduce the subjective levels of distress associated with traumatic events. (Bergmann, 2008; Verger et al., 2020).



EMDR is the invitation for the client to cultivate attentional flexibility. During reprocessing of traumatic memories, clients are invited to focus on specific images, thoughts, emotions, and sensations that activate left hemisphere processing. However, they are invited to "trust the process" by attending to their experience with curiosity, broadening the attentional field to a more spacious perspective that invites right hemisphere processing. Throughout therapy, clients are invited to notice their present moment experience and report any new discoveries. The novelty is then integrated back into the left brain as the client is invited to discuss how this new information is relevant to the current circumstances and future goals.

Clinicians can easily integrate somatic interventions into all phases of EMDR therapy.

INTEROCEPTION AND SOMATIC REAPPRAISAL

Individuals with chronic pain and illness are often hyper-aware of interoceptive and somatic sensory feedback. Interoception refers to the internal sensory awareness of the body that arises from changes in breathing, heart rate, or digestive activity. Interoceptors are the sensory receptors in the heart, stomach, liver, intestines, and other organs in the body. Interoceptive feedback is communicated to the brain via sensory receptors located in the body's muscles and organs. Interoception can be thought of as our sixth sense that allows us to become aware of our instinctual responses to our environment (Porges, 2001). When individuals are hypervigilant to these cues, they can get caught in a feedback loop that heightens anxiety and panic or, in some cases, contributes to a chronic feeling of helplessness or powerlessness.

Somatic psychology encourages the client to focus awareness on pain symptoms. This process can feel counterintuitive to those clients who

spend considerable time avoiding discomfort. However, mindfully observing the descriptive experience of pain sensations is one tool to change clients' subjective pain levels. When we mindfully observe the sensations, we tend to notice that they change; there is less constancy than previously expected. Mindful body awareness offers an opportunity to reflect upon the narrative story and any judgments that we make about our sensory experiences. This allows for "somatic reappraisal," which involves reassessing interpretations made about sensations (Price & Weng, 2021). In this manner, the healing process can be thought of as a series of corrective interoceptive moments in which the individual has a new safe and empowered felt sense of self that helps to resolve historical feelings of overwhelm or helplessness (Payne, Levine, & Crane-Godreau, 2015). We accomplish this by inviting our clients to develop their capacity to witness their experience, allowing them to notice the types of thoughts and emotions arising from concerning sensations.

Moreover, our mental narratives often reflect the nervous system state we are currently in. As Deb Dana writes, "The mind narrates what the nervous system knows. Story follows state." (Dana, 2018, p. 35.) The mind is better able to form an optimistic narrative, full of possibilities when we move out of an experience of feeling threatened into a felt sense of safety and connection. Somatic reappraisal allows us to refine the cognitive and affective loading that can sometimes worsen emotional dysregulation or physical pain. In this manner, we help clients to reclaim their capacity to refine their internal mentalizations actively and develop a realistically optimistic personal monologue.

EMDR THERAPY AND SOMATIC PSYCHOLOGY FOR CHRONIC PAIN

EMDR therapy has been shown to be effective in reducing symptoms of migraines, phantom limb pain, and other forms of chronic pain (de Roos et al., 2010; Gerhardt et al., 2013; Marcus, 2008; Salehian et al., 2016; Schneider, Hofmann, Rost, & Shapiro, 2008) As EMDR therapists, we are strategically positioned to help clients work with somatic symptoms of pain and illness. Somatic psychology recognizes that difficult life experiences, especially those related to developmental trauma, are maintained as tension patterns in the body and arousal states within the autonomic nervous system. Body-centered interventions invite clients to access their felt sense of self within the present moment. Like EMDR, somatic modalities trust that clients will access an inherent sense of wisdom that resides within the individual. Importantly, as van der Kolk states, the "body keeps the score;" therefore, somatic interventions need to be offered at a pace that respects the individual client's need.

For example, you might ask, "if that tension in your jaw had a voice, what would it say?" Through this creative approach to the work, we invite an integration across various areas of the brain as the client transitions between awareness of sensation into verbal processing.

Clinicians can easily integrate somatic interventions into all phases of EMDR therapy. For example, the history taking allows us to explore any symptoms of chronic pain or illness that the client might be experiencing. We can review the client's medical history and explore potential barriers to health care that may contribute to worsening symptoms. During the preparation phase, we can help our clients develop a felt sense of safety or relaxation as contrast to the felt sense of threat. We assist our clients in building a greater capacity for mindful body awareness and enhance times when they feel grounded, empowered, or at ease. A body-centered approach to care allows us to develop targets from somatic symptoms of pain or discomfort. Within the desensitization phase, we offer somatic interventions to help them remain somatically referenced during reprocessing or offer a modified protocol that allows clients to pendulate between somatic distress and neutral or pleasurable sensations in the body.

When working with clients with Complex PTSD and dissociation, we may notice that their physical symptoms are linked to implicit memories that manifest as parts within their internal family system. In some cases, unrealized developmental trauma can present as somatization symptoms, such as psychogenic seizures or migraines. In these cases, an integrative model can include parts of work therapy interventions that invite clients to explore the intelligence of their symptoms through a dialogue with a part of the body. For example, you might ask, "if that tension in your jaw had a voice, what would it say?" Through this creative approach to the

work, we invite an integration across various areas of the brain as the client transitions between awareness of sensation into verbal processing.

Overall, a mindset of curiosity and self-compassion while guiding clients to explore body awareness, conscious breathing, and gentle movements that can alleviate distress is needed. Clients then have opportunities to discover that chronic pain signals do not always necessitate further reactivity. This can reduce patterns of secondary tension, which then relieves the vicious cycle of chronic pain.

THE PRESENCE OF WELL-BEING

The impact of stressful or traumatic events can be offset by psychotherapy, and more specifically, EMDR therapy helps our clients build greater resilience by prioritizing the actions and behaviors that enhance their well-being. Health is not defined by the absence of disease; rather, it is recognized by the presence of well-being (WHO, 2022). Psychological and medical interventions tend to focus on reducing or eliminating symptoms without recognizing that many of us are seeking experiences a greater sense of connection, contentment, satisfaction, fulfillment, joy, and optimism for the future. As EMDR therapists, we offer our curiosity and compassion as we invite clients to access their inner source of wisdom. Doing so requires that we be willing to let go of a need to tell our clients what to "do" to find relief from their suffering; instead, we listen to what they need from a ground of connection and care. Attention to our clients' well-being invites us to move away from a medical model that focuses on pathology or illness. Rather than needing to "fix" clients, we recognize that they are already whole.

Dr. Schwartz has a private practice in Boulder, Colorado, providing psychotherapy, supervision, and consultation in Resilience Informed Therapy which applies research on trauma recovery, EMDR therapy, and somatic psychology to form a strength-based trauma treatment model.

References

Bergmann, U. (2012). *Neurobiological foundations for EMDR practice.* New York City, New York: Springer.

Bernard, D. L., Calhoun, C. D., Banks, D. E., Halliday, C. A., Hughes-Halbert, C., & Danielson, C. K. (2021). Making the "C-ACE" for a culturally-informed adverse childhood experiences framework to understand the pervasive mental health impact of racism on Black youth. *Journal of Child & Adolescent Trauma*, *14*(2), 233-247.

Boscarino, J. A. (2004). Post-traumatic stress disorder and physical illness: Results from clinical and epidemiologic studies. *Annals of the New York Academy of Science, 1032, 141–153.* doi:10.1196/ annals.1314.011

de Roos, C., Veenstra, A. C., de Jongh, A., den Hollander- Gijsman, M. E., van der Wee, N. J. A., Zitman, F. G., et al. (2010). Treatment of chronic phantom limb pain (PLP) using a trauma-focused psychological approach. *Pain Research and Management, 15,* 65–71.

Eisenberger, N. I. (2012). The pain of social disconnection: Examining the shared neural underpinnings of physical and social pain. *Nature Reviews Neuroscience, 13(6),* 421–434. doi:10.1038/ nrn3231

Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., et al. (1998). Relationship of child abuse and household dysfunction to many of the leading causes of death in adults. *American Journal of Preventive Medicine, 14(4),* 245–258.

Fogel, A. (2009). *Body sense: The science and practice of embodied self-awareness.* New York: Norton.

Gerhardt, A., Eich, W., Seidler, G., & Tesarz, J. (2013). Eye movement desensitization and reprocessing in chronic pain conditions. *OA Musculoskeletal Medicine,* 1(1), 7.

Grant, M. (2016). *Change your brain, change your pain: Based on EMDR.* Australia: Trauma and Pain Management Services.

Grummitt, L. R., Kreski, N. T., Kim, S. G., Platt, J., Keyes, K. M., & McLaughlin, K. A. (2021). Association of childhood adversity with morbidity and mortality in U.S. adults: a systematic review. *JAMA Pediatrics*, *175*(12), 1269-1278.

Harricharan, S., McKinnon, M. C., & Lanius, R. A. (2021). How processing of sensory information from the internal and external worlds shape the perception and engagement with the world in the aftermath of trauma: Implications for PTSD. *Frontiers in Neuroscience*, *15*, 360.

Hirschberger, G. (2018). Collective trauma and the social construction of meaning. *Frontiers in Psychology*, 1441.

Lanius, R. A., Brand, B., Vermetten, E., Frewen, P. A., & Spiegel, D. (2012). The dissociative subtype of post-traumatic stress disorder: Rationale, clinical and neurobiological evidence, and implications. *Depression and Anxiety, 29,* 701–708.

Marcus, S. V. (2008). Phase 1 of integrated EMDR: An abortive treatment for migraine headaches. *Journal of EMDR Practice and Research, 2*(1), 15–25.

McGilchrist, I. (2009). *The master and his emissary*. New Haven, Connecticut: Yale University Press.

Payne, P., Levine, P. A., & Crane-Godreau, M. A. (2015). Somatic experiencing: using interoception and proprioception as core elements of trauma therapy. *Frontiers in Psychology*, *6*, 93.

Porges, S. (2011). *The polyvagal theory: Neurobiological foundation of emotions, attachment, communication, and self-regulation.* New York: Norton.

Price, C. J., & Weng, H. Y. (2021). Facilitating Adaptive Emotion Processing and Somatic Reappraisal via Sustained Mindful Interoceptive Attention. *Frontiers in Psychology*, 3543.

Scaer, R. (2014). *The body bears the burden* (3rd ed.). New York: Routledge.

Schneider, J., Hofmann, A., Rost, C., & Shapiro, F. (2008). EMDR in the treatment of chronic phantom limb pain. *American Academy of Pain Medicine, 9*(1), 76–82.

Siegel, D. (1999). *The developing mind: How relationships and the brain interact to shape who we are.* New York: Guilford.

Siegel, D. J. (2001). Memory: An overview, with emphasis on developmental, interpersonal, and neurobiological aspects. *Journal of the American Academy of Child and Adolescent Psychiatry, 40*(9), 997–1011.

Siegel, D. J., & Bryson, T. P. (2021). *The power of showing up: How parental presence shapes who our kids become and how their brains get wired.* New York, NY: Ballantine Books.

Stickgold, R. (2002). EMDR: A putative neurobiological mechanism of action. *Journal of Clinical Psychology, 58*(1), 61–75.

Teicher, M. H., Samson, J. A., Anderson, C., Ohashi, K. (2016) Annual research review: enduring neurobiological effects of childhood abuse and neglect. *Journal of Child Psychology and Psychiatry*, 57(3), 241-266.

Vachon- Presseau, E., Roy, M., Martel, M., Caron, E., Marin, M., Chen, J., et al. (2013). The stress model of chronic pain: Evidence from basal cortisol and hippocampal structure and function in humans. *Brain*, 136(3), 815–827. doi:10.1093/brain/aw371

van der Kolk, B. (2015). *The body keeps the score: brain, mind, and body in the healing of trauma.* New York, NY: Viking Press.

van den Hurk, A. W. V., Ujvari, C., Greenspan, N., Malaspina, D., Jimenez, X. F., & Walsh-Messinger, J. (2022). Childhood Trauma Exposure Increases Long COVID Risk. *medRxiv*.

Verger, A., Rousseau, P. F., Malbos, E., Chawki, M. B., Nicolas, F., Lançon, C., & Guedj, E. (2020). Involvement of the cerebellum in EMDR efficiency: A metabolic connectivity PET study in PTSD. *European Journal of Psychotraumatology*, *11*(1), 1767986

World Health Organization. *Constitution of the World Health Organization: Basic Documents*. 45th ed. Supplement. Geneva: World Health Organization, www.who.int/about/governance/constitution