

## **Mind and Body**

By Keith Eric Grant, PhD, NCTMB

"We have been closet Cartesians in modern medicine, treating the mind as though it were reactive to, but otherwise disconnected from, disease in the body. Although medical science has productively focused on the pathophysiology of disease, such as tumor biology, coronary artery disease, and immunology, it has done so at the expense of studying the body's psychophysiological reactions to these disease processes.

These reactions are mediated by brain and body mechanisms, including the endocrine, neuroimmune, and autonomic nervous systems. While a large portion of the variance in any disease outcome is accounted for by the specific local pathophysiology of that disease, some variability must also be explained by host resistance factors which include the manner of response to the stress of the illness."

- *David Spiegel, MD*<sup>8</sup>

Science fiction writer Arthur C. Clarke stated, "Any sufficiently advanced technology is indistinguishable from magic." Increasingly, our technological abilities to create multi sensory virtual realities approach such magic. On a recent family trip to Disney's California Adventure, I was provided the visual, auditory, kinesthetic and olfactory illusion of soaring over multiple areas of California. Other virtual reality research has created the three-dimensional image of a cat that could be palpated with a special pen to feel bones and muscles.<sup>7</sup>

As fantastic as these accomplishments are, they still pale before the moment-by-moment magic of our own mind and body in creating our sensory experience of embodiment and presence. If ever you have doubted, even for a moment, how important the touch and human connection you provide can be to others, consider the lessons recently learned from neurological research.

Using functional magnetic resonance imaging (MRI), researchers have been able to track changes in blood oxygen flow to areas of the brain while different cognitive tasks are performed or emotional stimuli is processed. This has provided a window deep into the functional structures of our brain. Other studies of cognitive or emotional losses with brain injuries have yielded clues to the multiple paths by which emotional reactions result from stimuli passed to the amygdala structure of our brain.<sup>2,3</sup> Research has shown that we learn to respond to situations, particularly those that are stressful or fearful, in both conscious and unconscious ways. According to Joseph LeDoux, our unconscious memories affect our actions and the way we experience our body:<sup>2</sup>

"Emotional and declarative (i.e., conscious) memories are stored and retrieved in parallel, and their activities are joined seamlessly in our conscious experience. That does not mean that we have direct conscious access to our emotional memory; it means instead that we have access to the consequences—such as the way we behave, the way our bodies feel. These consequences combine with current declarative memory to form a new declarative memory. Emotion is not just unconscious memory: it exerts a powerful influence on declarative memory and other thought processes."

Our emotions and senses of having emotional support are shown to have profound effects on our health. Bruce McEwen and his associates have coined the term allostasis for our ability to adapt to the total stress in our lives.<sup>4,5</sup> They note the extreme importance of the psychosocial context of our lives on our biological responses:<sup>5</sup>

"Behavior plays an important role in the biological responses to a changing external world, and brain mechanisms underlying behavior are themselves targets for biological mediators such as the adrenal hormones, making it virtually impossible to separate behavior from biology. Human social behavior plays an important role in creating challenges, in the form of social and physical living and working environments that may be stressful or supportive."

David Spiegel has reported a significant relationship between mental attitudes, social support and the progression of cancer.<sup>8,9</sup> Similarly, the crucial importance of the mind and emotions on physical health has been extensively discussed by Esther Sternberg and Philip Gold:<sup>10</sup>

"Stress is not only personal, but is perceived through the prism of interactions with other persons. Social interactions can either add to or lessen psychological stress and similarly affect our hormonal responses to it, which in turn can alter immune responses. Thus, the social psychological stresses that

we experience can affect our susceptibility to inflammatory and infectious diseases and the course of a disease."

For instance, studies have shown that persons exposed to chronic social stresses for more than two months have increased susceptibility to the common cold. On the other hand, a positive supportive environment of extensive social networks or group psychotherapy can enhance immune response and resistance to disease-even cancer. Women with breast cancer, for instance, who receive strong, positive social support during their illness, have significantly longer life spans than women without such support.

Beyond the process of learning to react to stress, and beyond the effects of our reactions on our health, the mind can integrate all of our sensory input and responses into our sense of self. We are able to build within us a consistency over time and a synthesis of all of our felt input that we identify with - a sense of self that may have been negatively impacted by abuse or trauma, and that can be positively affected by support and caring sensory input. Antonio Damasio hypothesizes how we build this magical sense of self.<sup>1</sup>

"Objective brain processes knit the subjectivity of the conscious mind out of the cloth of sensory mapping. And because the most fundamental sensory mapping pertains to body states and is imaged as feelings, the sense of self in the act of knowing emerges as a special kind of feeling - the feeling of what happens in an organism caught in the act of interacting with an object."

Dr. Vilayanur Ramachandran notes both the construction of our sense of body and that, even as adults, the image that the mind has built remains malleable.<sup>6</sup>

"The question of how the brain constructs a body image has been a topic of considerable interest to neurologists, psychologists, and even philosophers. Even though this image is constructed from evanescent and fragmentary evidence derived from multiple sensory systems such as vision, proprioception and hearing, we have a stable internal mental construct of a unitary corporeal self that endures in space and time, at least until its eventual annihilation in death. ... Experiments demonstrate that there is a tremendous amount of latent plasticity even in the adult human brain and that one's body image is surprisingly malleable; more so than anyone would have imagined."

Given the above, the simple act of reaching out with your touch and presence may reach far deeper than we could have previously imagined. Few come to us unwounded in soul or unstressed by life. In reaching out to give of ourselves, we may well reach the core of each other's being to help reunite mind and body. What we

are learning on the forefronts of science says that we have a unique opportunity to make a difference.

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