

## The Role of Adjunctive Integrative Neurophysiological Interventions in Promoting Eating Disorder Recovery

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### ABSTRACT

Eating disorders are disorders of the brain, mind and body. Eating disorder pathology is reflected in the loss of the nervous system's capacity to integrate mind, brain and body, impairing the integrity and function of the core self. Negatively impacting one's relationship with the self, eating disorders give rise to distortions in self-sensing and self-perception, and the diminishment of self-regulation and self-trust. By re-defining the development of the self as an "embodied, sensory-based process grounded in kinesthetic experience," 21<sup>st</sup> century brain research and technology have substantively expanded the breadth and scope of clinical ED practice. Incorporating mindful somatosensory-based neurophysiological and psychophysiological treatment interventions as adjuncts to traditional 'best practice' treatment techniques facilitates mind-brain-body connections, fostering self-integration, self-regulation and emotional resiliency, all components of a complete and sustainable ED recovery. Though research points to the centrality of the neuroplastic brain's role in effective ED treatment and recovery, the introduction of bottom up and top down neurophysiological somatosensory-based treatment interventions into the mainstream clinical milieu has, to date, been rarely applied. The future of eating disorder treatment lies in the partnership between the brain and distributed nervous system, as well as the therapist and patient. Approaches to care that stimulate intra- and inter-personal neuronal connectivity enable the brain's capacity to heal itself and the patient, and the patient's capacity to heal one's self through integrating the brain and distributed nervous system.

**Keywords:** Clinical eating disorders, Neurophysiological interventions, Psychophysiological interventions, Somatosensory interventions, Self-integration, Mind-brain-body connections, Embodied brain

**Abbreviations:** ED: Eating Disorder(s); BBAT: Basic Body Awareness Therapy; PTSD: Post Traumatic Stress Disorder

### THE ROLE OF THE BRAIN IN EATING DISORDER PATHOGENESIS

It has been said that "the days of differentiating psychology versus biology versus neurology are fading" [1]. Eating disorders (ED) are disorders of the brain. Though their symptoms manifest in behaviors that impair physiological function, "neurobiological vulnerability makes a substantial contribution to the pathogenesis of anorexia nervosa and bulimia nervosa" [2]. Disrupting the integrity of the patient's core self, the wiring of the eating disordered brain creates impairment in self-sensing, self-perception, and the self-regulation of thoughts, emotions and behaviors. "Anorexic body image distortions suggest "abnormalities of circuits through the postulated 'self' networks" [3,4]. Because diagnoses of anorexia nervosa, bulimia nervosa and binge eating disorder are "defined by aberrations in brain circuitry and physiology, treatment needs to be aimed at correcting or ameliorating aberrant circuitry" [5]. The focus of clinical treatment needs to address healing the disordered brain,

along with the patient...healing the self, along with one's relationship with food.

### NEUROPHYSIOLOGICAL INTERVENTIONS REINTEGRATE THE FRAGMENTED CORE SELF

"The domain of the Self seems to be where psychology crosses path with brains and bodies" [6]. Mind, brain and body connectivity is an objective reality, with no valid integrative fabric, with no one single element separated from any other [7]. In further refining this definition, the field of interpersonal neurobiology has conceptualized the Self as

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“an embodied sensory-based process grounded in kinesthetic experience” [8], thus expanding the breadth and scope of treatments that promote self-healing through self-integration. “Pathology is marked by the lack of integration between mind, brain and body, a condition negatively impacting the integrity of the core self” [6]. The introduction of mindful, somatosensory-based neurophysiological and psychophysiological treatment interventions as adjuncts to traditional ‘best practice’ ED treatment strategies carves new neuronal pathways that create activity in neurons that fire and wire together within and between domains that harbor the functions of ED pathology. By enhancing sensory awareness and sensory integration, these interventions foster mind-brain-body connections which promote self-integration and self-regulation, cultivating emotional resiliency; all are components of a complete ED recovery.

“The somatosensory system is a 3-neuron system that relays sensations detected in the periphery and conveys them via pathways through the spinal cord, brainstem, and thalamic relay nuclei to the sensory cortex in the parietal lobe” [9]. “All experience encompassing thought, sensation, feeling and behavior [movement], be it conscious or unconscious, is embedded in neurons” [7]. “Where attention goes, neural firing occurs, catalyzing the integration of isolated segments of one’s mental reality” [8]. “Somatosensory-based movement with attention has been called the ‘specificity scalpel into the brain to re-carve neuro-circuits” [10]. “Motor mobilization precedes the consciousness of feelings” [11].

Examples of kinesthetic ‘bottom up’ neurophysiological somatosensory interventions include the Feldenkrais Method of Somatic Education™ [12], which allows patients to consciously reconnect with their unconscious sensorimotor repertoire; and trauma-informed yoga [13], which accesses traumatic memories that are encoded sub-cortically [14]. Experience and action affect the brain from ‘the outside in,’ (bottom up); thought, imagination and feelings affect the brain from ‘inside out’ (top down [7]. Of particular relevance to ED patients with post-traumatic stress disorder (PTSD), bottom up neurophysiological interventions have been proven effective in addressing “the repetitive, unbidden, physical sensations, movement inhibitions and somatosensory intrusions of unresolved trauma” [15]. Empathic resonance, a potent psychophysiological treatment tool, represents a mindful, interpersonal psychotherapeutic right-brain to right-brain hemispheric connection between psychotherapist and patient which gives rise to “a therapy relationship so deeply ensconced in psychophysiology as to be considered sharing a common brain” [16].

### THE CURRENT STATE OF THE FIELD

Eating Disorders are integrative disorders that impact the mind, brain and body. Their onset is brought about by an integration of factors that potentially include genetics, neurobiology, physiology, nutrition, cognitive function,

behavior, attachment dysfunctions, mood disorders, emotional development, and past trauma. Treatment requirements for comprehensive, diverse and integrative approaches to ED care that facilitate mind, brain and body connections demand uniquely specialized treatment protocols that lie beyond the purview of generic psychotherapy practice. The unique requirements of ED care have not yet been universally recognized and accepted by professionals in the field of mental health treatment. Minimally referenced in ED research and treatment literature, integrative neurophysiological somatosensory-based treatment strategies are rarely applied within the ED clinical milieu. Effective ED treatment needs to spotlight the significant role of the neuroplastic brain within a healing three-pronged partnership with the patient and therapist.

The fulfillment of the intention to change habitual behaviors requires changes in the body and the nervous system, as well as the mind. In conjunction with more traditional forms of ‘best practice’ ED treatment, the introduction of in-session, neurophysiological movement-based and/or breath-related techniques (be it in chairs, standing upright or on floor mats) promotes body-centered self-awareness, self-sensing, and self-regulation, facilitating the patient’s self-integration, self-trust and autonomous self-care, all hallmarks of timely and sustainable ED recovery. Enhancing the process, clinicians who provide psychoeducation for patients and families by ‘talking the talk’ about the role of neurobiology in disease onset, development, and healing, clarify *how* and *why* a complete and sustainable recovery needs to take place within the distributed nervous system. Cognition and movement, in conjunction with experiential sensory-based self-awareness, augments the patient’s incentive and capacity to heal, while giving rise to feelings of empowerment and global well-being.

Within the context of a mindful, safe and trusting psychotherapeutic relationship between therapist and patient, the ED clinician’s versatile and ever-flexible use of oneself within the therapeutic moment requires mindful sensibility, courageous spontaneity and personal and professional comfortability in introducing interventions that harness the global resourcefulness of the patient’s brain domains otherwise passed over through the sole reliance on more traditional forms of treatment. The treating professional’s own personal engagement in various forms of somatosensory interventions offers invaluable sensory-based self-awareness, creating and informing professional insight and intuition into when, with whom, and how best, to introduce relevant, practicable, healing neurophysiological interventions into the unique therapeutic moment in response to the unique needs of the patient.

### CONCLUSION

At the start of the 21<sup>st</sup> century, the advent of brain tracking technology began to shed significant light on how people make changes in psychotherapy. “The lack of knowledge

about the pathogenesis of clinical eating disorders in the brain and nervous system hinders the development of effective treatment” [17]. The future of treatment for ED and body image disturbances lies in the use of alternative, nontraditional approaches to care (i.e., adjunctive somatosensory-based, neurophysiological and psychophysiological interventions) that harness genetics and neuroscience in the service of more effective healing and prevention. The inclusion of adjunctive neurophysiological interventions in front-line clinical practice brings the neuroplastic brain on line, providing novel opportunities for growth and learning, inspiring motivation and confidence in one’s capacity to change. Integrative forms of treatment that stimulate intra- and inter-personal neuronal connectivity facilitate the brain’s capacity to heal itself and the patient, and the patient’s capacity to heal one’s self through integrating the brain and the distributed nervous system.

Recent scientific evidence suggests a shift towards more targeted brain-based interventions [18], as seen in a 2019 study of an innovative psychomotor physiotherapeutic technique (Basic Body Awareness Therapy - BBAT) that addresses one’s relationship to one’s body, demonstrating an increase in body acceptance and well-being [19]. Additional research suggests that “global health could benefit from safe effective evidence-based breathing techniques and related mind-body practices integrated into healthcare systems and other community services through training healthcare providers, yoga therapists, school personnel, first responders and those who work in non-profits and non-governmental organizations” [20]. There is significant room for improvement in ED treatment efficacy. Bridging the research/practice gap that currently exists within the ED field promises to define new directions for quantitative research, as well as clinical practice.

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