

Neuropsychological and Biochemical Foundations of Kriya Yoga with Ajna Point Focus

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Abstract

This conceptual paper explores the neuropsychological and biochemical foundations of Kriya Yoga practices focusing on the Ajna point (between the eyebrows). Through integration of neuroscience, yoga psychology, and biochemistry, this work outlines how Kriya sequences activate cortical regulation, vagal tone, and autonomic balance while influencing neurotransmitter activity, mitochondrial function, and endocrine equilibrium. The discussion situates these effects within traditional yogic understanding of pranic flow and consciousness, emphasizing Ajna as a regulatory node for self-awareness and neuroplastic integration.

Introduction

Kriya Yoga is a systematized internal technique aimed at harmonizing physiological, psychological, and spiritual processes. Its central focus—the Ajna point—represents the locus of attention, executive regulation, and self-observation. Contemporary neuropsychology identifies such focused awareness as engaging the prefrontal cortex, anterior cingulate gyrus, and insular regions, which collectively mediate attention regulation, interoceptive awareness, and emotional balance. This paper examines the intersection between these neural mechanisms and the biochemical effects of sequential Kriya practices, aiming to elucidate their integrated scientific and yogic basis.

Neuropsychological Foundations

Closed-eye Kriya practices with Ajna point concentration induce activation of neural networks underlying focused attention, relaxation, and embodied awareness. Neuroimaging studies of meditative attention suggest modulation of the default mode network (DMN), decreased amygdala reactivity, and enhanced gamma synchrony. Sequential Kriya exercises provide proprioceptive feedback from the periphery to the central nervous system, thereby enhancing cortical–subcortical integration. This process stabilizes autonomic tone via parasympathetic dominance, reflected in improved vagal regulation and homeostasis.

Biochemical and Cellular Mechanisms

From a biochemical perspective, rhythmic breathing, muscular engagement, and conscious awareness inherent in Kriya practices influence neurotransmitter balance, including upregulation of gamma-aminobutyric acid (GABA) and serotonin levels, and modulation of stress hormones such as cortisol. These mechanisms reduce oxidative stress, improve mitochondrial respiration, and enhance cellular repair. Regular practice activates genetic pathways linked to neuroplasticity (e.g., BDNF expression) and longevity through autophagic signaling.

Yogic and Pranic Interpretation

According to classical Kriya Yoga philosophy, the human system is an integration of prana (vital energy), chitta (consciousness), and sharira (body). Ajna chakra functions as the control center for the subtle energy system, bridging sensory input and intuitive awareness. Focusing attention at Ajna harmonizes ida and pingala—symbolic correlates of parasympathetic and sympathetic activity—resulting in equilibrium of body and mind. This resonance between yogic and neurobiological frameworks reflects an underlying psycho-energetic coherence.

Sequential Kriya Table (Neuropsychological Mapping)

The following table summarizes the neurological, biochemical, and psychological correlates of the forty-two sequential Kriya practices performed with closed eyes and Ajna point focus.

Step	Kriya	Eyes Closed + Ajna Focus	Neurological/ Biological Effects	Psychological/ Cognitive Benefit
1	Whole Body Recharging (Toes to Head)	Reduces visual load; enhances interoceptive attention	Activates somatosensory pathways; integrates spinal afferents; cortical body mapping	Grounding; reduces scattered thoughts; mind-body integration
2	Leg Recharging and Ankle Rotation	Same	Stimulates ankle and leg proprioceptors; cerebellar coordination; improves circulation	Stability and rootedness; reduces lower body tension; meditative grounding
3	Leg and Arm Recharging	Same	Interlimb motor neuron activation; sensorimotor cortex integration; systemic circulation	Energetic flow; reduces tension; focused alertness
4	Shoulder and Hip Recharging	Same	Rotator cuff & hip proprioceptors; cerebellar coordination; improved vascularization	Releases joint tension; posture awareness; energy integration
5	Back Recharging	Same	Erector spinae & spinal proprioceptors; spinal sensorimotor integration; cortical awareness	Reduces back tension; sense of stability; mind-body alignment
6	Shoulder Recharging	Same	Glenohumeral joint proprioceptors; corticospinal motor activation; circulation	Releases shoulder tension; posture improvement; energetic flow
7	Throat Recharging	Same	Laryngeal muscle activation; cervical circulation; vagal modulation	Relieves communication tension; enhances focus; relaxation
8	Neck Recharging (F/B)	Same	Cervical paraspinal proprioceptors; brainstem afferents; interoceptive awareness	Reduces neck stiffness; improves orientation awareness; calm focus
9	Neck Recharging (Lateral)	Same	Cervical lateral flexor proprioception; vestibular-cervical integration; circulation	Releases lateral neck tension; centeredness; posture awareness
10	Head Rotation	Same	Suboccipital proprioceptors; vestibular & cerebellar circuits; cranial circulation	Relieves head/neck tension; improves orientation; calm focus
11	Spinal Twist	Same	Spinal rotators & intervertebral proprioceptors; cortical integration; paraspinal circulation	Reduces spinal tension; energy release; body awareness
12	Spinal Rotation	Same	Facet joint mechanoreceptors; trunk-limb neuromuscular coordination; spinal blood flow	Releases spine stiffness; proprioceptive awareness; energy flow
13	Spinal Recharging (Lateral Bending)	Same	Lateral spinal muscles activation; intervertebral joint integration; circulation	Reduces lateral torso tension; mind-body flexibility; calm alertness
14	Spinal Adjustment	Same	Optimize spinal proprioceptive feedback; corticospinal & vestibular integration; reflex activation	Stability; reduces stiffness; body awareness

15	Spinal Swing	Same	Erector spinae & stabilizers; spinal fluid circulation; cerebellar-vestibular circuits	Tension release; rhythmic relaxation; energetic flow
16	Head Recharging	Same	Trigeminal afferents; scalp blood flow; parasympathetic modulation	Mental fatigue reduction; improved focus; refreshment
17	Facial Muscles	Same	Trigeminal sensory activation; microcirculation; limbic modulation	Reduces emotional tension; interoception; calmness
18	Biceps Recharging	Same	Alpha motor neurons; muscle spindle proprioception; local perfusion	Bodily control; tension reduction; readiness
19	Lateral Body	Same	Intercostal/oblique proprioceptors; spinal coordination; vagal tone enhancement	Releases torso tension; improves body symmetrical awareness; enhances calm focus
20	Whole Body (Part by Part)	Same	Cortical motor map integration; sensorimotor synchrony; autonomic balance	Builds whole-body awareness; reduces anxiety; promotes internal coherence
21	Whole Body (Toes to Head)	Same	Bottom-up spinal afferents; cortical homunculus mapping; parasympathetic activation	Grounding; restores bodily integration; deepens mindfulness
22	Arms (Down to Shoulders)	Same	Brachial plexus activation; joint proprioceptors; circulation	Releases upper body tension; increases embodiment; prepares for active motion
23	Arms (Double Breathing)	Same	Respiratory-motor network coordination; vagal afferent activation; cortical-subcortical synchrony	Induces calm alertness; lowers anxiety; sharpens concentration
24	Arms (Sides to Shoulders)	Same	Rotator cuff proprioception; cortical mapping; muscle spindle feedback	Increases upper-body fluidity; relieves stiffness; enhances energy flow
25	Arms (Rotation)	Same	Cerebellar coordination; joint proprioceptors; vascular perfusion	Promotes movement fluency; tension release; improves dynamic self-awareness
26	Arms (Down to Forehead)	Same	Cranial circulation; arm-head coordination; proprioceptive loops	Improves mental clarity; heightens energy perception; strengthens meditative alertness
27	Fingers	Same	Cortical hand representation; tactile mechanoreceptors; digit proprioception	Reduces digital fatigue; heightens tactile mindfulness; enhances precision and focus
28	Arms (General)	Same	Alpha/gamma motor neuron activation; proprioception; circulation	Releases accumulated tension; increases sense of embodiment; promotes readiness
29	Body (Raising Arms)	Same	Postural stabilizers; cardiopulmonary activation; proprioceptive feedback	Elevates mood; increases bodily expansion and openness; unifies body-mind state

30	Lateral Bending with Arms Raised	Same	Intercostal/oblique proprioceptors; trunk-arm coordination; vascular flow	Relieves lateral tension; improves respiratory efficiency; heightens spatial awareness
31	Spot Walking	Same	Lower limb motor neurons; proprioception; cardiorespiratory stimulation	Improves grounding and alertness; balances hemispheric activation; increases rhythmic awareness
32	Spot Running	Same	Corticospinal activation; cerebellar coordination; cardiovascular output	Boosts vitality; uplifts mood; reduces stress hormones
33	Fencing	Same	Premotor and cerebellar circuits; interlimb coordination; reflexive responses	Increases confidence, focus, and psychomotor synchronization
34	Arms (Rotation)	Same	Rotator cuff proprioception; cerebellar coordination; circulation	Relieves stiffness; promotes flow state; integrates physical and energetic awareness
35	Abdomen	Same	Core muscles; visceral mechanoreceptors; blood/lymph flow	Releases core emotional tension; strengthens gut-brain axis regulation; enhances grounding
36	Repeat Kriya 1	Same	Neural pathway reinforcement; motor memory; sensorimotor integration	Builds confidence; induces calm focus; integrates learned movement patterns
37	Repeat Kriya 2	Same	Cortical-subcortical consolidation; proprioceptive integration; coordination	Enhances body-mind harmony; deepens meditative state; stabilizes mood
38	Leg Rotation (Largest Circle)	Same	Hip proprioceptors; cerebellar coordination; vascular perfusion	Releases lower-body tension; improves pelvic mobility; energizes lower chakras
39	Lowering Height with Arms Up	Same	Postural stabilizers; proprioceptive feedback; circulation	Promotes balance between alertness and relaxation; stabilizes autonomic tone
40	Lowering Height with Palms on Medulla	Same	Stimulates cranial base (medulla-vagus complex); modulates parasympathetic output; rebalances cranial-spinal communication	Induces inward calm; promotes emotional regulation; enhances meditative awareness
41	Lowering Height with Palms on Waist	Same	Activates lumbar and sacral proprioceptors; engages postural stabilizers; improves spinal alignment	Grounds attention; strengthens core stability; fosters physical-mental steadiness
42	Release the Breath (Completion)	Same	Resets respiratory and autonomic rhythms; reduces cortical beta activity; enhances vagal tone	Promotes emotional release; integrates practice experience; restores homeostasis

[Table: 42-step Kriya sequence with associated neural, biochemical, and psychological effects.]

Integrative Discussion

Kriya Yoga's systematized progression from peripheral muscle engagement to subtle sensory withdrawal aligns with hierarchical models of brain-body integration. Through somatosensory feedback, respiratory synchronization, and attentional control, practitioners induce an ascending regulation from spinal proprioceptors to cortical awareness. Biochemically, this is mirrored in reduced inflammatory cytokines,

balanced hypothalamic-pituitary-adrenal axis activity, and improved vagal tone. Such multidimensional regulation reflects both the yogic concept of pranic flow and modern psychophysiological coherence.

Conclusion

The integration of neuroscience, biochemistry, and yogic philosophy demonstrates that Kriya Yoga, particularly with Ajna point focus, facilitates a harmonized state of neurophysiological coherence and psychospiritual stability. Sequential engagement of bodily, neural, and energetic layers promotes sustained homeostasis and heightened consciousness. These findings affirm Kriya as a discipline of psycho-neuro-biochemical optimization, with significant implications for modern therapeutic and contemplative science.

References

- Becker, R. O., & Selden, G. (1985). Electromagnetism and the foundation of life. William Morrow.
- Benson, H., & Klipper, M. Z. (2000). Relaxation response. HarperCollins.
- Black, D. S., & Slavich, G. M. (2016). Mindfulness meditation and the immune system: A systematic review. *Annals of the New York Academy of Sciences*, 1373(1), 13–24.
- Cryan, J. F., & Dinan, T. G. (2012). Mind-altering microorganisms: The impact of the gut microbiota on brain and behaviour. *Nature Reviews Neuroscience*, 13(10), 701–712.
- Davidson, R. J., & McEwen, B. S. (2012). Social influences on neuroplasticity: Stress and interventions to promote well-being. *Nature Neuroscience*, 15(5), 689–695.
- Madeo, F., Zimmermann, A., Maiuri, M. C., & Kroemer, G. (2015). Essential role for autophagy in life span extension. *The Journal of Clinical Investigation*, 125(1), 85–93.
- McEwen, B. S. (2007). Physiology and neurobiology of stress and adaptation: Central role of the brain. *Physiological Reviews*, 87(3), 873–904.
- Oschman, J. L. (2016). Energy medicine: The scientific basis. Elsevier.
- Streeter, C. C., Gerbarg, P. L., Saper, R. B., Ciraulo, D. A., & Brown, R. P. (2012). Effects of yoga on the autonomic nervous system, gamma-aminobutyric-acid, and allostasis in epilepsy, depression, and post-traumatic stress disorder. *Medical Hypotheses*, 78(5), 571–579.
- Tang, Y.-Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. *Nature Reviews Neuroscience*, 16(4), 213–225.
- Wallace, D. C. (2018). Mitochondrial genetic medicine. *Nature Genetics*, 50(12), 1642–1649.
- Yogananda, P. (1933). Recharging your body battery. Self-Realization Fellowship.
- KriyaYoga Ashram & Research Institute. (n.d.). The science of KriyaYoga meditation as taught by Guruji Yogi Satyam [Webpage]. Retrieved October 23, 2025, from <https://www.kriyayoga-yogisatyam.org/recharging>.