**Neuroplasticity and Cortical Remapping: Basic Concepts & Clinical Implications**

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Although the idea that the brain is plastic was first suggested in 1890 by the psychologist, William James, neuroplasticity is a science of the last decade. To date, there is no agreed definition of neuroplasticity. The term is used to reflect an enduring change in the structure or function of a single neuron or population of neurons that correlate with behavioral changes. Taken together, neuroplasticity can be considered the ability of the central nervous system to respond to intrinsic or extrinsic stimuli by reorganizing its structure, function and/or connections. Neuroplastic changes can occur at several levels: the molecular level; the synaptic level (with the re-organization of circuitry, and increase in number and strength of connections); the cellular level (with increased dendrites and spines, and neurogenesis); as well as at the behavior level. These neuroplastic changes can take place at various times during the individual’s lifespan: 1) during development of the brain (developmental plasticity); 2) with repeated activity (activity-dependent plasticity); 3) during learning (plasticity of learning and memory) and 4) after injury or disease (injury-induced plasticity). Neuroscientists now realize that plasticity is not an occasional state, but an ongoing state throughout the lifespan. Cytoarchitecture and functional studies of the cerebral hemispheres have demonstrated that different areas of the cerebral cortex have different structures and carry out different functions. Taking into account that cortical synaptic reorganization is at the backbone of neuroplasticity, cortical mapping allows us to examine macroscopic changes in the brain structure in response to environmental changes, training, disease or therapy. The recent realization the brain is plastic and dynamic suggests that understanding neuroplasticity and how it can be modulated, may allow us to improve neurological recovery following disease or trauma.