

The self-repairing capability of the brain

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Neuroplasticity is a phenomenon in modern science that is considered to be the most significant development for understanding the brain and its amazing ability to change and heal itself according to mental experiences. In contrast, our understanding is that the brain is fixed and is unchangeable but has the ability to create new neural pathways to adapt to its needs. This new finding has led to a breakthrough in "brain training" in order to improve focus, memory attention and performance. Multiple sclerosis, Parkinson's disease, autism, and attention deficit disorder are some conditions whereby the brain's general neuronal and cellular health becomes misaligned or behaves in an unusual way. These problems may be the results of inflammation or toxicity. Circuits in the brain may become dormant, die or begin to fire at irregular rates. Neuroplasticity can be of 2 types including functional plasticity which is the ability of the brain to move functions from a damaged area of the brain to undamaged areas, and structural plasticity which is the ability of the brain to actually change its physical structure as a result of new learning experiences. Damage to key areas of the brain can result in deficits in those areas although some recovery may be possible, other areas cannot fully take over those functions that were affected by the damage. Neuroplasticity can be improved by learning a new language, learning to play a new instrument, travelling and exploring new places, creating art, and other new pursuits. This also can be done by getting plenty of rest, which plays an important role in dendritic growth in the brain, and exercise, which may prevent neuron losses in the key areas of the hippocampus (the part of the brain responsible for memory and other functions). Modern research shows that the brain continues to create new neural pathways and alter existing ones according to new experiences, information and new memories. As the field of neuroscience grew in popularity, a collection of research shows that humans are not restricted to the mental talents they are born with and that even damaged brains may undergo extraordinary transformations.

Keywords: Neuroplasticity, Functional plasticity, Structural plasticity, Hippocampus, Neural pathways

Citation:

Maheesha Abeykoon. The self-repairing capability of the brain. The Torch. 2021. 2(51). Available from:

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