

TMS TRENDS

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DEPRESSION AND OVERALL HEALTH

It is often overlooked that depression not only takes a toll on one's behavioral and emotional well-being, but can also be burdensome on an individual's physical health. Research suggests that the concurrent existence of untreated or poorly treated major depression has been shown to have a significant, negative impact on the morbidity and mortality for a variety of medical conditions including stroke, heart disease, myocardial infarction, diabetes, congestive heart failure, and HIV. One study found that participants who reported depression and/or anxiety at baseline experienced 1.5 times the number of deaths compared to rates for the rest of the population studied (Murphy, J.M., et al., 1987).

These deleterious effects are thought to emerge because untreated depression may adversely affect an individual's ability to follow through with recommended beneficial health behaviors (e.g. quitting smoking, maintaining healthy eating habits, or good sleep hygiene), but also from direct biological effects of major depression (e.g. long-lasting activation of the HPA axis leading to sustained hypercortisolism).

It is our belief that TMS Therapy plays a major role in preventing the potential long-term negative health outcomes that depressed patients may come to face after failed attempts with traditional treatment options.

BIOLOGICAL EFFECTS OF TMS

There is a growing body of literature demonstrating the mechanism of effect of TMS in the brain. It is well-established that the acute effect of TMS is the generation of a local electric current that depolarizes neurons in the cortex. The figure below shows the functional magnetic resonance imaging (fMRI) scan results of an experiment demonstrating that these acute effects are observed directly in the local area of stimulation, and also are subsequently propagated indirectly through synaptic connections in other areas of the brain that are anatomically connected to that local area (Li X., et al., 2004).

The figure below shows blood flow changes under the coil itself, and also in distant cortical and subcortical regions located outside the area of stimulation. Subcortical regions affected include the cingulate, insula, orbital frontal cortex, and amygdala. All of these areas of the brain, those stimulated both directly and indirectly, are implicated in the regulation of mood.

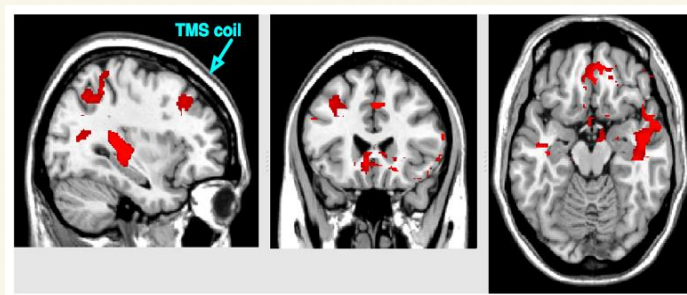


Figure 1. Functional magnetic resonance fMRI scan results showing direct and indirect activation of brain regions with TMS