

Robert Chen, MA, MBBChir, MSc, FRCPC , Toronto Western Hospital has been awarded research grant through the DMRF research program.

Title: Effects of internal globus pallidus deep brain stimulation for dystonia on cortical circuits and plasticity.

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Research Description

Deep brain stimulation (DBS) is an effective treatment for dystonia. Although it is still not known how it works, brain reorganization or plasticity likely plays an important role. Brain plasticity is known to be disturbed in dystonia. The proposed study will be performed in people with dystonia who had been treated with DBS of the internal globus pallidus (GPi), the usual brain target for treatment of dystonia. The first project will use recording of electrical brain waves to determine precisely when and which area of the cortex (superficial part of the brain) is activated by GPi DBS. The second project will examine the brain waves produced by GPi DBS is associated with part of the brain known as the motor cortex being more or less excitable. A method known as transcranial magnetic stimulation (TMS) will be used to stimulate the brain at various times after GPi DBS is delivered. The third project will determine whether pairing stimulation of the cortex by TMS and deep brain stimulation of the GPi at critical time intervals will induce brain plasticity or changes how excitable the brain is. The findings will make DBS programming easier and improve the outcome of this treatment. It will also improve our understanding of how DBS works and may lead to novel therapies for dystonia.