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Sponsored by the Neurological Foundation of New Zealand & Brain Research New Zealand.

Factsheet: Professor John Rothwell's Public Lecture on Transcranial Magnetic Stimulation (TMS)

Professor John Rothwell of University College London. Otago Museum, University of Otago

Who is Professor John Rothwell?

Visiting Professor John Rothwell is a globally respected leader in human movement function and non-invasive brain stimulation techniques for analysing changes in neurological disease. He is a member of the BRNZ International Scientific Advisory Committee and is Head of the Physiology and Pathophysiology of Human Motor Control lab at University College London.

His visit to Dunedin was sponsored by the Brain Research New Zealand, Brain Health Research Centre and the Neurological Foundation of New Zealand.

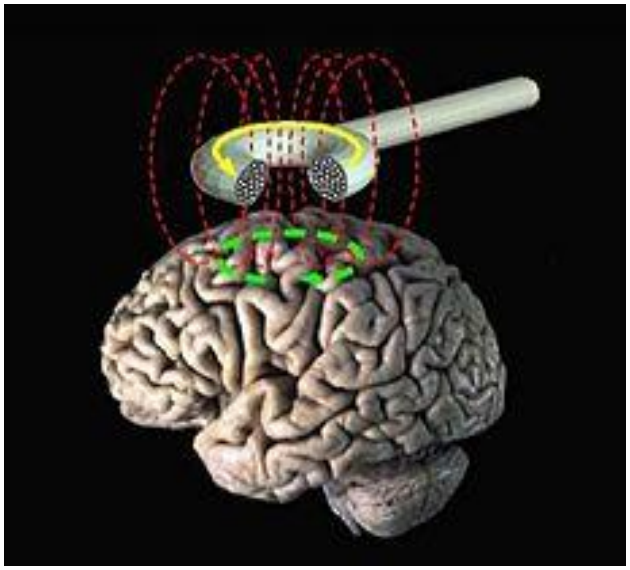
During his stay he gave both an academic seminar and a public lecture on the topic of transcranial magnetic stimulation.

What was the focus of the lecture?

During Professor Rothwell's hour long lecture, he answered the question: *"Can electrical stimulation boost your brain?"*

Around 300 people saw Professor Rothwell's spectacular demonstration of a transcranial magnetic stimulator, which he used on himself.

With the help of an assistant, he clearly demonstrated how the stimulation to his right motor cortex caused the twitching in his left hand.



Transcranial magnetic stimulation (Wikicommons)

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What is transcranial magnetic stimulation?

Transcranial magnetic stimulation (TMS) uses a strong magnet to send a pulse of magnetic energy through the skull.Inside of the brain, this magnetic energy stimulates neurons. Professor Rothwell's research has shown that this stimulation can improve cognitive function, physical movement and memory in a laboratory setting.

Transcranial magnetic stimulation (TMS): How could this technology be applied to our own lives?

TMS could be used to speed up learning and for Stroke recovery. Professor Rothwell's research team in London tested the average acceleration of a motor task. A specific kind of thumb tapping over a 10 minute duration.

- Participants who didn't receive TMS, thumb tapped at a speed 1.25x faster after 10 minutes.
- Participants who received TMS before the experiment began thumb tapped at a speed that was 1.5x faster after 10 minutes.

This research finding also has implications for Stroke recovery treatments

- ✓ Patients who received a combination of TMS and physical therapy were shown to improve both faster and to a greater extent after 10 days than patients who had only received the physical therapy.
- ✓ The use of these devices to produce small increases in the learning of motor movements, and restoration after stroke, suggest that this technology could have a wide range of applications.

But will we ever have a machine like this in our own homes, or in the office to help us think? Professor Rothwell doesn't think so. "It's like a drug," he said, "if used incorrectly it could do more harm than good."

While Professor Rothwell stressed that this technology is still in early days, it definitely shows promise in increasing the effectiveness of current treatments for brain injury.

Read more about Professor John Rothwell by visiting the BHRC website.

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