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► **COVER:** 'Illusion of the brain' by Kirsten Lee, inspired by the Review on p522.



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Non-invasive techniques to treat neurological disorders are attractive to both patients and doctors. Such techniques include transcranial magnetic stimulation (TMS), a method in which the cortex is stimulated through the scalp. Our current understanding of the working mechanism of this technique is limited, but TMS is increasingly applied in various neurological conditions ranging from cocaine addiction to stroke and depression.

The Perspective by Ridding and Rothwell on page 559 discusses how TMS for the treatment of depression has inconsistent results, as shown in meta-analyses. Should we continue to test TMS for depression in expensive clinical trials if we do not even know how it works? As the disease mechanism of depression itself is poorly understood, such trials might not lead to a reliable and effective treatment for depression. The authors suggest that TMS trials might be better focussed on stroke patients, as we have more knowledge about the damaged brain areas and the accompanying functional loss. Treatments with TMS might benefit patients and help researchers to elucidate the mechanism of action of TMS.

In general, do we need to understand the working mechanism of a technique before applying it clinically? Aspirin would never have become the widely used painkiller it is today if this were the case. Furthermore, we are still trying to understand the molecular mechanism of the effects of antidepressants. This could argue against the requirement of a deeper understanding of TMS mechanisms before its clinical application.

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