

## NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

### Interventional procedures consultation document

# Transcranial magnetic stimulation for auditory hallucinations

Auditory hallucinations are when you hear sounds that do not exist (such as hearing voices). In this procedure, a device containing an electromagnet is held against the scalp. This produces pulses of magnetic energy that stimulate specific areas in the brain through the skull (transcranial). Treatment involves daily or twice daily sessions of about 20 minutes. The aim is to stop or reduce the auditory hallucinations.

NICE is looking at transcranial magnetic stimulation for auditory hallucinations.

NICE's interventional procedures advisory committee met to consider the evidence and the opinions of professional experts, who are consultants with knowledge of the procedure.

This document contains the draft guidance for [consultation](#). Your views are welcome, particularly:

- comments on the draft recommendations
- information about factual inaccuracies
- additional relevant evidence, with references if possible.

NICE is committed to promoting equality of opportunity, eliminating unlawful discrimination and fostering good relations between people with particular protected characteristics and others.

**This is not NICE's final guidance on this procedure. The draft guidance may change after this consultation.**

After consultation ends, the committee will:

- meet again to consider the consultation comments, review the evidence and make appropriate changes to the draft guidance

- prepare a second draft, which will go through a [resolution](#) process before the final guidance is agreed.

Please note that we reserve the right to summarise and edit comments received during consultation or not to publish them at all if, in the reasonable opinion of NICE, there are a lot of comments or if publishing the comments would be unlawful or otherwise inappropriate.

Closing date for comments: 25 March 2020

Target date for publication of guidance: June 2020

## 1 Draft recommendations

- 1.1 Evidence on the safety of transcranial magnetic stimulation for auditory hallucinations is adequate and raises no major safety concerns. However, evidence on its efficacy is inadequate in quantity and quality. Therefore, this procedure should only be used in the context of [research](#).
- 1.2 Further research should be in the form of randomised controlled trials and should use well described treatment protocols. Studies should report details of patient selection, including underlying disease and other treatments, the area of brain treated and the imaging used to target it, and long-term outcomes for at least 1 year.

## 2 The condition, current treatments and procedure

### *The condition*

- 2.1 Auditory hallucinations are when you hear sounds that do not exist (such as hearing voices). They are often symptoms of mental health problems such as schizophrenia, bipolar disorder, major depression and post-traumatic stress disorder. However, they may also be symptoms of temporal lobe epilepsy, dementia,

neurological infections and brain tumours. And they are sometimes caused by lack of sleep, extreme hunger, or the use of recreational or prescribed drugs.

### ***Current treatments***

- 2.2 The treatment options for auditory hallucinations depend on the underlying cause. For example, antipsychotic medication may help with hallucinations for people living with schizophrenia. Some people find strategies such as learning to understand their voices, taking control and keeping busy are helpful in managing the condition.

### ***The procedure***

- 2.3 Transcranial magnetic stimulation is typically done with the patient awake and sitting in a chair. The operator places an electromagnetic coil against the scalp, over a specific region of the brain, usually the left temporoparietal area. Pulses of electrical current in the coil generate rapidly pulsating magnetic fields that pass through the skull and meninges and into the brain. The magnetic field is relatively powerful but short lived (milliseconds). The precise mechanism of action is unclear but it produces both excitatory and inhibitory effects on cortical neurons. The amount of stimulation and the target area is adjusted for each patient. Treatment usually comprises daily or twice daily sessions lasting about 20 minutes. The number of sessions varies but it could be up to 30. The aim is to stop or reduce the auditory hallucinations.
- 2.4 Stimulation can be repetitive, with pulses of magnetic energy delivered at various frequencies or stimulus intensities. In the standard repetitive technique, individual pulses are repeated at a pre-set interval (repetition of pulses). In the theta-burst technique, short bursts of pulses are repeated at a pre-set interval (repetition of bursts). In the deep repetitive technique, deeper and broader brain regions are stimulated than in the standard technique.

### **3 Committee considerations**

#### ***The evidence***

- 3.1 NICE did a rapid review of the published literature on the efficacy and safety of this procedure. This comprised a comprehensive literature search and detailed review of the evidence from 7 sources, which was discussed by the committee. The evidence included 1 systematic review, 5 randomised controlled trials (3 of which are also included in the systematic review) and 1 review of safety events (including some of the same studies that are included in the systematic review). It is presented in table 2 of the [interventional procedures overview](#). Other relevant literature is in the appendix of the overview.
- 3.2 The professional experts and the committee considered the key efficacy outcomes to be: remission or reduction of the intensity or frequency of auditory hallucinations, and improvement in quality of life.
- 3.3 The professional experts and the committee considered the key safety outcomes to be: headache, inadvertent muscle stimulation, worsening underlying psychiatric disease including triggering of manic episodes, and seizures.

#### ***Committee comments***

- 3.4 The committee was informed that there is more than 1 device available for this procedure.
- 3.5 The committee noted that there is a large placebo effect with this treatment.
- 3.6 Treatment may be targeted using imaging such as MRI or EEG.
- 3.7 This treatment is typically used as an adjunct to other therapies.

- 3.8 A wide variety of treatment protocols were used in the evidence considered by the committee.

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Chair, interventional procedures advisory committee

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