

Repetitive transcranial magnetic stimulation in depression

Information sheet

This information sheet provides detailed information about repetitive transcranial magnetic stimulation (rTMS) and its use in the treatment of depression. You will need to read this information and sign the attached consent form before undergoing treatment.

What is rTMS?

rTMS is a mild form of brain stimulation. Magnetic fields, generated by a simple coil placed on the head, are used to stimulate a small area of the brain. While receiving stimulation, you are fully awake. rTMS is usually well tolerated with minimal side effects. There is no anaesthetic and memory is not affected.

During an rTMS procedure, an electrical current passes through a small coil placed close to the scalp. This current induces a magnetic field, which can pass into the brain without resistance. When the magnetic field is of sufficient strength, it will stimulate electrical activity in nerves below the coil, i.e. in superficial regions of the brain. This stimulation is repeated many times per second and with variation in intensity; these variations will determine the effects of the stimulation. rTMS can be applied in differing ways to either increase or decrease local brain activity.

Independent studies on rTMS in depression

Independent studies show that rTMS is more effective than a sham or placebo type of stimulation, especially in patients who have not responded well to antidepressant medication. When receiving rTMS in a treatment protocol, it is usually applied for between 20 and 45 minutes, generally on a daily basis over a course of several weeks.

Patients accessing rTMS at a Healthe Care Australia hospital are prescribed rTMS by one of the hospital's consultant psychiatrists, and treatment episodes are administered by an accredited clinician as part of a comprehensive inpatient treatment plan for patients with depression. During an inpatient admission, you are enrolled in a psychoeducation group therapy program; and undergo

review and assessment by your treating psychiatrist throughout admission. As required, medication review at the discretion of your treating psychiatrist also occurs.

What happens during rTMS treatment?

During an rTMS session you are seated in a comfortable chair, awake and aware of what is happening at all times.

Before the treatment course begins, some time is spent stimulating an area of the brain that controls muscle movement in the hand opposite to the side of the brain on which the stimulation is occurring. Although you may feel small twitches in the hand during this procedure, it is not harmful. This is done to establish the minimum energy requirement to activate neurons specific to you. This energy is then used to individualise the treatment to your needs.

During the treatment, a magnetic coil is placed on the scalp near the front region of the brain. This may be on the left or right depending on how the treatment is being administered. The coil is connected to a machine that converts an electrical current into a magnetic field. As the magnetic field is produced by the electrical current switching on and off, the machine produces a clicking sound although you will be provided with ear plugs to prevent any related sound. You may feel a tapping sensation under the coil (this occurs due to a twitch produced in scalp muscles as the magnetic field crosses into the brain). The magnetic field can also stimulate small nerves around the head and face. The stimulation can be applied in a variety of ways; the most common as a long train of rapid pulses administered over a few seconds at a time, or a slow train of pulses over 60 seconds.

If the rTMS is effective in treating depression for you, the impact may not be fully appreciated for several weeks. Most patients who respond feel different during the second or third week but they may not report improvement until the third or fourth week of treatment.

rTMS is usually administered in a defined course to try and achieve a remission or substantial reduction in depression severity based on available research evidence. Depression is a relapsing disorder and so it is possible that it will return after treatment for most patients sometime in the future. Therefore, most patients are encouraged to continue with other treatment including antidepressant medications and psychological based therapies, especially to maintain mood stability after the treatment when rTMS finishes.

Side effects

There are several potential side effects that might be experienced during an rTMS procedure.

Firstly, a headache or neck ache can occur, similar to a tension headache, caused by the stimulation of nerves in the scalp. This occurs in approximately five of every one hundred (100) participants studied and will usually improve rapidly with simple pain medication such as 'Aspirin' or 'Panadol'.

Secondly, the stimulation itself may be uncomfortable. As the magnetic field passes into the brain, it can cause stimulation of muscles in the scalp causing them to contract. This can feel like a twitch, a tapping sensation or a brief muscle cramp. How strong this feels varies dramatically between subjects; some feel almost nothing and others a stronger sensation. Those who do find it uncomfortable usually find they get used to the sensation over a few days and strength of the stimulation pulse can be lowered until then.

Risks

The main concern reportedly associated with rTMS is its potential to cause a fit or seizure. Safety guidelines to limit the dose of rTMS used started to be employed in the late 1990s and there have been very few seizures with the treatment since then; the risk appears quite low. You should always tell your doctor if you change your medication or experience other medical issues during a course of rTMS as medication changes or medical illness could affect the risk of seizure. We will ask you to wear ear plugs during rTMS treatment. Although the vast majority of research conducted to date suggests that rTMS is safe and without long term side effects, it is still possible that there are risks that we are not yet aware of.

There are several reasons why someone cannot have routine rTMS in a Health Care facility. These include a diagnosis of epilepsy, an active brain illness such as a recent stroke or anything that may be affected by the magnetic field. This can include metal implants in the head, surgical clips, cardiac pacemakers, implanted medication pumps or electrodes. rTMS may also be avoided if a patient has an unstable medical condition (for example, heart disease) that could be exacerbated if they were to suffer a seizure. The safety of rTMS in pregnancy has not been evaluated and is not recommended at this time. If any of these conditions are relevant to you, it is very important that you let us know prior to undertaking treatment.

Although unlikely, more recently ophthalmological risks have been identified with undergoing rTMS treatment. This may include contraction of extraocular muscles causing repetitive eye movement and secondary retinal trauma; or delayed visual changes in the hours following treatment.

Other treatments while undergoing rTMS

It is important to tell your doctor and our rTMS staff about any treatments or medication you may be undertaking including non-prescription medications or herbal remedies and any changes to these during your participation with rTMS. We typically try to avoid significant changes to medication, or starting new medications that affect the brain, during a course of rTMS treatment as this is likely to confuse our understanding about what might have produced any therapeutic benefits with this treatment.