

## Repetitive Transcranial Magnetic Stimulation (rTMS) for Pain Management

### What is rTMS?

rTMS is a focal brain stimulation treatment that involves passing small electromagnetic currents through certain areas of the brain. Different areas of the brain can be targeted by holding a specially designed coil near the patient's scalp. The energy applied acts to stimulate nerve cells in that particular brain region. In pain management, an area of the brain called the primary motor cortex (M1) is typically targeted. rTMS has been successfully used in the treatment of a number of different conditions including neuropathic pain, fibromyalgia, tinnitus, depression, migraines and PTSD amongst others.

### How does rTMS work in managing pain?

rTMS exerts its effect via a myriad of complex pathways. One mechanism in particular involves opioids, which are the body's own pain relieving chemicals. When rTMS stimulates the brain area involved in pain there is a significant release of opioids. Opioids work in conjunction with a number of other brain chemical systems to create long term changes to the brain cells involved in pain that provides significant pain relief beyond the time of stimulation.

### Are there any side effects?

rTMS is a safe and well-tolerated treatment with no brain impairments or other serious side effects. rTMS has been used to treat thousands of people and only a small percentage of people discontinue treatment because of side effects. Some uncommon side effects include:

- **Headache:** this is the most common side effect and occurs in about half of patients treated with rTMS. These headaches are usually minor and generally resolve over the course of treatment. Simple over the counter pain medication (e.g. paracetamol) is usually sufficient to treat these headaches, but they are self-resolving
- **Scalp discomfort:** this is usually minor and occurs in about 1/3rd of patients. This occurs where the coil is placed over the scalp and often resolves by the 3rd treatment. Adjustments can be made to the coil position and stimulation settings to reduce discomfort.

- **Seizures:** this is an extremely rare side effect and typically occurs in people at risk of seizures. These seizures are usually of short duration and self-limiting. Patients are screened prior to treatment to ensure they do not fall in this at risk category. The chances of having a seizure during an rTMS treatment is lower than the chance of having a seizure while taking an antidepressant or analgesic drug.

It is important to note that all patients are monitored during each treatment session by specially trained medical and nursing staff. Any side effects will be managed and are reversible once the rTMS treatment stops. As rTMS is a relatively new treatment, there may be unforeseeable risks that are not currently recognized.

### Are there any patients who should not receive rTMS?

A medical practitioner who has expertise in rTMS treatment will complete a thorough assessment prior to treatment to ensure safety and suitability. In general patients who have a history of epileptic seizures or those who have metal in their heads should not receive rTMS. This can include (not exhaustive):

- Metal stents in the neck or brain
- Deep brain stimulators
- Aneurysm clips or coils
- Metallic implants in your head, ears, eyes or neck
- Facial tattoos with metallic ink
- Other metal objects around your head region

Patients with non-epileptic seizures are generally safe to have TMS treatment.

### How can I get rTMS treatment?

rTMS is a medical treatment that requires an assessment by a trained medical practitioner. Modalis has several specialist physicians who can assist with a treatment plan. You will need a referral from your GP or other medical practitioner to Modalis who will then arrange an assessment session.

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### What happens during an rTMS treatment?

Before treatment commences patients will have completed a thorough assessment with a specialist physician that also includes an MRI brain scan. This helps to determine treatment suitability and ensure correct targeting of the brain area involved in the patient's pain.

During each treatment patients will be asked to remove any magnetic related objects (e.g. mobile phones, jewellery) as these can interfere with the rTMS machine. Patients may be required to wear earplugs during the treatment for their comfort as the rTMS machine can produce a loud clicking sound. Similar to an MRI machine, but usually quieter. You will be seated during the treatment.

The first TMS session is a dosing treatment where several measures are made to ensure the TMS coil is in the correct position and the right level of stimulation is applied. This involves applying the rTMS coil over the scalp and several brief pulses are applied to establish what is called the motor threshold. The motor threshold is the minimum amount of energy needed to elicit a twitch in the thumb muscles. This level varies between individuals, but ensures the right amount of energy is used to stimulate the brain cells. Once this level has been established treatment can then be commenced. The motor threshold is not checked at every treatment, but may be reassessed if there is a concern this has changed.

During the treatment, patients will hear a series of clicking sounds and feel a tapping sensation on the scalp adjacent to where the coil is applied. Patients will have regular observations taken from nursing staff. The patient can stop a treatment at any time by asking the staff member present.

### Who administers rTMS?

The rTMS treatment will be prescribed by a specialist physician who is trained in the use of rTMS. The treatment itself is then administered by an experienced nursing technician under the supervision of the treating specialist physician. The rTMS nurse and a physician will always be present to monitor the patient during the treatment.

### How long is an rTMS treatment?

The exact length of rTMS treatment for pain can vary between patients. Some patients can notice benefit after 5 treatments, whereas others may need to go up to 25. This will be assessed on an ongoing basis. Each treatment session can also

vary, but you can expect a typical treatment to last around 20-25 minutes. Patients receive rTMS treatment 5 days per week, Monday to Friday.

### Will I need to be hospitalized for rTMS treatment?

rTMS can be conducted in the outpatient setting. No sedation or anaesthesia is required and the patient is fully awake and aware during the treatment. There is no specific recovery time, so patients can drive home after their treatment and resume their normal activity.

### Will I need to do anything before the treatment?

In most cases, you will not need any specific preparation before the treatment. You will have been assessed by your doctor and an MRI brain organized. The MRI brain images will be uploaded to the rTMS program and used to guide your treatment.

### How long will the benefit last?

A positive treatment response to rTMS varies between patients. A reduction in pain intensity is just one measure of success. Other areas include improvement in function, psychological and emotional wellbeing, improvement to sleep and quality of life, and reduction in opioid analgesia. Duration of benefit can also vary between patients and conditions. In chronic pain, benefits can last up to 2 months, but usually require "top up" sessions to maintain the benefit. How often a patient receives a top up session can also vary. Patients can expect to receive one treatment every month for a period of 6 months to consider rTMS a worthwhile treatment.

### Is there anything else I need to be aware of?

rTMS as an outpatient is not currently funded by Medicare or any of the private health funds. If you are a DVA patient or covered by a third party insurance claim then you may be able to have your treatment costs covered. If you are responsible for the treatment then you can expect to pay \$220 for the initial session and \$180 for each treatment thereafter.

Your rTMS treating doctor may arrange a follow up appointment after your treatment to assess your response and to arrange any longer term maintenance sessions if required.

If you have any further queries please do not hesitate to contact one of our friendly reception staff on **(08) 6166 3733** or email **tms@modalis.com.au**. Our reception is open Monday-Friday between 9:00am and 4:30pm.