

TRANSCRANIAL MAGNETIC STIMULATION | FOR PAIN



Information
Booklet

What is Transcranial Magnetic Simulation (TMS)?

TMS is a safe, effective and non-invasive therapy for depression as well as several other psychiatric and neurological conditions. This form of therapy has been in use for over 30 years and is currently extensively used in North America, Europe as well as Australia. The treatment works on the principle of neuromodulation of the brain circuitry. Brain circuits which have become under or overactive are either stimulated or suppressed to restore the healthy functioning of the brain. This is achieved by stimulating the surface layer of the brain, also called the cortex, with magnetic impulses using a TMS machine and coil assembly. In the treatment of depression these magnetic impulses are typically used to stimulate an area of the brain called the left dorsolateral prefrontal cortex (DLPFC). Magnetic stimulation of this part of the brain with the associated activation of brain circuitry deeper in the brain, has been proven to be effective treatment for depression, including depression which is resistant to anti-depressant medication therapy.

If you are currently on anti-depressants or other medications, you can safely continue to take all your medications whilst undergoing TMS therapy.

TMS is NOT electroconvulsive therapy (ECT). Unlike ECT, in TMS therapy patients are awake and able to interact during treatments. TMS is generally well tolerated and it does not impair memory.



Transcranial Magnetic Stimulation (TMS) for pain.

TMS therapy for pain is a non-pharmacological and non-invasive approach, designed to provide effective relief from chronic pain. With a strong focus on evidence-based practice, we continuously monitor and assess the efficacy of our TMS treatments, ensuring that our patients receive the highest standard of care. Our team of experienced medical professionals is dedicated to tailoring a personalised TMS treatment plan that targets your specific pain concerns, ensuring a holistic approach to pain management that prioritises your well-being and comfort.

The role of magnetic stimulation in chronic pain.

Magnetic stimulation refers to stimulation of nerve cells (neurones) in the brain and peripheral nerves. If the magnetic stimulation is of the brain, it is referred to as Transcranial Magnetic Stimulation or TMS. If the magnetic stimulation is directed at nerves and muscles in areas of the body other than the brain, it is referred to as Peripheral Magnetic Stimulation or PMS.

TMS works by generating powerful magnetic pulses that reach through the bone of the skull to stimulate parts of the brain. By targeting different parts of the brain TMS can treat a variety of psychiatric and neurological conditions. Depending on the frequency of the magnetic pulse TMS can either stimulate or inhibit nerve cells and neural circuits. There is strong evidence that TMS is effective in treatment of depression and other psychiatric conditions, and increasing evidence that TMS is effective for neurological conditions such as Parkinson's disease, tinnitus, and various chronic pain conditions.



How is magnetic stimulation used to treat chronic pain?

To treat chronic pain, we utilise TMS (stimulation to the brain) or PMS (stimulation to the painful body part). To achieve the best analgesic effect we often use both TMS and PMS in combination. Patients routinely receive TMS followed by PMS in the same session to treat both the central and peripheral part of the pain system. There is some evidence that both PMS and TMS can modulate the areas of the brain responsible for pain perception.

TMS for pain may utilise a variety of brain targets and stimulation frequencies. Dorsolateral prefrontal cortex (DLPFC), Supplementary Motor Area (SMA) and Motor Strip (M1) are all targets that have been successfully used to treat chronic pain in published research. Your doctor will advise you which particular target and frequency are recommended for your particular pain presentation.

PMS for chronic pain involves applying the coil that generates the magnetic impulses directly to your body, usually to the area of maximal pain. For PMS we use an inhibitory frequency of magnetic pulses called continuous theta burst stimulation or cTBS. This captures peripheral nerve circuits, particularly proprioception circuits and is effective in giving pain relief.

Please note

It is important for patients to understand that while they are likely to experience good initial pain relief after PMS, that this effect is usually not sustained initially. For most patients their pain gradually returns after a few hours. Following a series of TMS/PMS treatments the pain relief effect is usually more sustained, and for some patients can last for months or longer. This is why a series of 6 to 12 TMS/PMS sessions are recommended. Some patients will find that their pain recurs some months after the TMS/PMS sessions. In this case a few retreatment sessions spaced throughout the year can be used to manage the chronic pain condition.

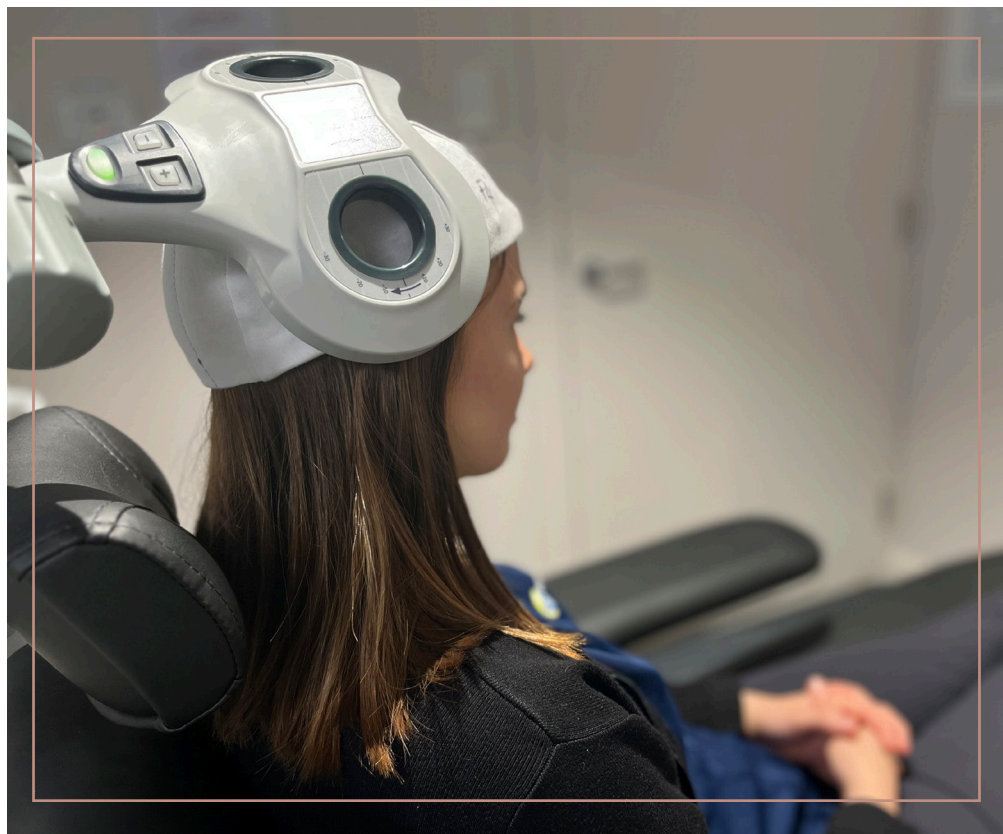
Patients may opt to have PMS only without TMS. However for best long term results we usually recommend a combined treatment of TMS and PMS for chronic pain.



What can you expect from magnetic stimulation treatment for pain?

Whilst we cannot guarantee that magnetic stimulation will resolve all your pain, there is increasing evidence that this treatment modality is effective for many patients suffering with chronic pain syndromes. For patients who respond to this treatment modality, we can expect improvement of the pain within the first few treatment sessions. We usually provide 3 treatment sessions per week and continue for up to 4 weeks to ensure that the pain relief is sustained. For some patients further future sessions of magnetic stimulation may be indicated to relieve pain.

The magnetic pulse stimulation is experienced as a rapid tapping sensation on the skin of the patient. On the forehead and the front of the scalp this pulsation can be experienced as painful, so we usually reduce the intensity of the magnetic pulse to comfortable levels. On the body, PMS stimulation is often experienced as giving immediate pain relief, and patients often ask for the stimulation intensity to be increased.



What are the adverse effects of TMS?

TMS is a safe and well tolerated therapy.

Common adverse effects of TMS are as follows:

- Headache (these tend to settle after the first few sessions)
- Scalp discomfort
- Tingling, facial muscle twitching
- Noise related discomfort (patients wear ear plugs during TMS therapy)

Rare adverse effects of TMS are as follows:

- Seizure. The chance of seizure is one in 30 thousand, which is lower than the seizure rate for patients treated with anti-depressants. *Please note that in the unlikely event that you do experience a seizure during treatment, this will affect your fitness to drive.*
- Syncope (fainting)
- Mood elevation (elevated mood tends to settle on cessation of TMS)

Unlike electroconvulsive therapy (ECT) TMS causes NO adverse cognitive effects.

Who should not have TMS?

Patients with a pre-existing vulnerability to seizures should not undergo TMS. This includes patients with a past history of:

- Epilepsy
- Acute brain disease (such as recent strokes, head injury or growing brain tumours)
- Alcohol or drug withdrawal states

Patients with metallic materials in their head and upper body region may also not be safe for TMS as the therapy utilizes strong magnetic impulses. This includes patients with:

- Metallic (ferrous) implants
- Cochlear implants
- Metallic foreign bodies in the eye (from past injuries).
- Vagal nerve stimulators
- Cardiac pacemakers
- Spinal cord stimulators

Please note that metallic implants, stimulators and pacemakers deemed MRI safe are generally safe for TMS therapy.

The Pioneer TMS team will perform a detail screening process of patient candidates to ensure that TMS will be safe for you. Pregnancy, childhood and certain occupations (metalworkers, welders, truck drivers) are relative contra-indications to TMS which your doctor will discuss with you.

What will TMS involve for me?

Your TMS therapy will start with an induction meeting, at which our Pioneer Health TMS team will ensure that the treatment is safe and appropriate for you. The consent form and this Induction Booklet explain the risks, benefits and costs of TMS therapy and form part of the induction.

For TMS therapy you will be seated in a comfortable reclining chair with a head support. The first TMS session involves measuring the strength of the magnetic impulse required for your treatment. This process of testing is called testing for the “resting motor threshold”. Next your clinician will measure the optimal treatment spot for impulse administration. Once the magnetic coil assembly is placed in the correct location and orientation, just touching your scalp, the treatment will commence. The TMS impulse feels like someone tapping your scalp with a pencil, and the machine emits a clicking noise as this occurs. You will be wearing earbuds during therapy sessions. The length of the therapy session will differ from patient to patient.

What is the cost of Transcranial Magnetic Stimulation (TMS)?

TMS for conditions other than treatment-resistant depression is not covered under Medicare and will incur a private fee. Costs vary from patient to patient and condition to condition. You will be provided with a quote at your initial consultation.



Infection control measures at the Pioneer Health TMS service.

Pioneer Health makes every endeavour to make your TMS sessions as safe as possible to minimise your risk of infection with respiratory viruses such as COVID. We have a special ventilation system in the TMS room to safeguard our patients we furthermore suggest that patients wear a mask to TMS sessions to give them additional protection from infections such as COVID. Of course, should patients develop cold and flu symptoms we ask you to phone our TMS at your earliest convenience.

Why am I invited to participate in research into TMS in general practice?

Whilst TMS is a well established therapy for depression for decades around the world, it is still an evolving therapy with current research underway into using TMS in a range of other brain related conditions. TMS was initially provided by large metropolitan teaching hospitals and has over recent years made its way into private practice. The use of TMS in Australian general practice is a relatively new development. If TMS therapy can be successfully made available to the wider Australian community then we have an exciting opportunity to revolutionise the treatment of depression and other psychiatric and neurologic conditions. To achieve this, we need to collect data that supports the safety and efficacy of TMS in general practice. Hence at Pioneer Health we invite every TMS patient enrol in our TMS research project.

If you consent to be being included in our research project, we will use some of your de-identified information in our research data set. Information we would collect would include your sex, age, diagnosis, assessments scores for your condition pre, intra and post treatment as well as the type and duration of TMS provided to you. This information would be used for the purposes of research and education and may eventually be published in a medical journal. We may collaborate with research institutions such as Universities, and in this case your data may be used and published as part of a multi-centre trial. If such collaborative research efforts proceeded, you may be contacted by us to provide additional consent for such research.

