Trans Cranial Magnetic Stimulation (rTMS)
setting up a service in the Private sector

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What is TMS?

• A relatively new treatment for depression
• Relies on direct stimulation of the brain using a magnetic pulse to generate brief electrical currents that stimulate nerve cells in the regions of the brain involved in depression.
• No anaesthetic required
• No cognitive side effects
• Treatment can be administered by Nursing staff/trained technicians
Role of rTMS

• rTMS is used to treat depression.
• Depression is very common – approx 55% patients admitted to RHC private psychiatric hospitals in Adelaide had depression.
• Not all patients respond to antidepressant medication and/or psychological therapies.
• Antidepressant medications have many side effects so are not always well tolerated.
• Sometimes trials of several different antidepressants are needed and are still unsuccessful.
• Patients who do not respond to antidepressants are often treated with electroconvulsive therapy (ECT).
How does TMS work?

- A magnetic field created by a coil placed close to the scalp induces a current in the cortex.
- This current causes depolarization and stimulation of a local cortical region.
- Provided the stimulus is of sufficiently low current and frequency, a generalized seizure is not produced.
Our Service – how we started

• Psychiatrist proposal
• Committee established
• Strong Research and Evaluation component
• Consistent with RANZCP position statement
• Costings
• Approvals under Research protocols
A typical commercial TMS device and chair. The total cost of equipment, software and training is over $100,000.
• Professor Paul Fitzgerald (The Alfred Hospital in Melbourne) provided training for service directors and Nursing staff
• Funded by Ramsay Health Care
• Assessment and suitability criteria established
• Practical training in mapping the position of the DLPFC (Dorsolateral prefrontal cortex) and the motor threshold
Training cont’d

• Practical session and operation of the rTMS device

• Treatment and research protocols and policies
Staffing and Administration

• Two Clinical Directors (Psychiatrists)

• Registered Nurses

• Psychologist (Research Assistant)

• Clinical Governance by the rTMS Committee which meets every 3 months.
rTMS Suite

• An area of the hospital identified
• Treatment room
• Waiting room
• Office
• Coil cooling room
• MagPro R30 rTMS machine and two MCF coils purchased
• Comfortable chair
• Disposable earplugs
Clinical interest

• Psychiatrist “interest” evening with the machine

• CME
Referral

- Credentialled Psychiatrists
- Outpatient status but must have private health cover
- Inclusion criteria include MDD, over 18yrs no history of seizures, no metal in head (eg surgical clips) not psychotic, willing to attend 3-5 mornings/week for an hour (up to six weeks).
- Must be able to speak and understand English
Initial Assessment

• Locate motor cortex
• Determine intensity of motor threshold
• Measure 6cm forward to DLPFC
• Make individual patient template

• These parameters determine the location and intensity of treatment
Safety / side effects

• The stimulation produces a loud audible ‘click.’ Patients wear earplugs to prevent acoustic trauma.
• There is a very small risk of seizures – usually with higher stimulus intensities or patients with low seizure threshold (e.g. on tricyclics, or with a past history of epilepsy)
• Small rates of induction of mania or hypomania are noted – smaller rates than with antidepressant medication
• Some transient treatment related effects
  – Scalp pain or discomfort during stimulation (due to scalp nerve or muscle stimulation during treatment)
  – Headaches
• No cognitive side effects noted in studies
Ethics Approval

- All patients treated participate in Research protocol
- Approved by Ramsay Health Care SA Ethics Committee
- All patients give written informed consent
• 222 referrals received from 51 psychiatrists
• 160 patients accepted for treatment
• 92 completed first course, 18 completed 2nd course, 9 maintenance, 1 auditory hallucinations patient
• Only rTMS service in SA
• Currently no Medicare item number
• Costs of treatment not reimbursed by Private Health funds
• 2005 application made to MSAC by RANZCP
• More evidence now supporting efficacy of rTMS with antidepressant medication as the preferable comparator
• Application made to Medicare (MSAC) for item number
Obstacles

• Challenging financial aspect
• Coils overheating
• Mechanical issues – support arm
• Software issues
Measures

• Primary outcome measure: 21 item Hamilton Rating Scale for Depression (HAMD; Hedlung and Vieweg, 1979)
• Montgomery-Åsberg Depression Rating Scale (MADRS; Montgomery & Åsberg, 1979)
• Zung self-rating depression scale (Zung, 1965)
• 14 item Hamilton Anxiety Rating Scale (HAMA; Hamilton 1959)
Results – Overall Efficacy

Significant improvement on all outcome measures at the p<.001 level (paired t-test results)
Conclusion

• Effective
• Well tolerated
• Advantages over alternate treatment methodologies i.e. no sedation or agitation
  no weight gain
  no sexual dysfunction

rTMS provides another valuable treatment option
Enhanced rTMS

• Recently commenced stage 2

• rTMS plus Mindfulness group therapy, Internet CBT, Relaxation and Gym (Physical exercise)
Thank you
Any questions?