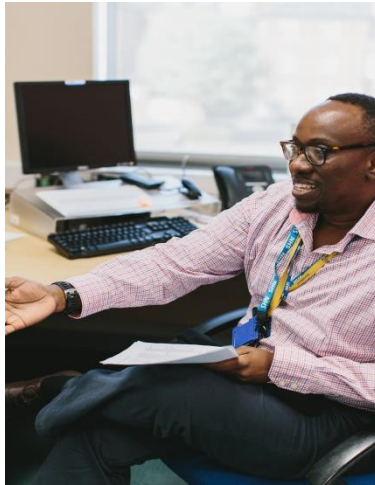


Neuromodulation the future



NORTHAMPTONSHIRE HEALTHCARE NHS FOUNDATION TRUST

#weareNHFT

Inspected and rated
Outstanding ★
 Care Quality
Commission

MAKING A
DIFFERENCE
FOR YOU,
WITH YOU

Setting the Scene

Tina Sore

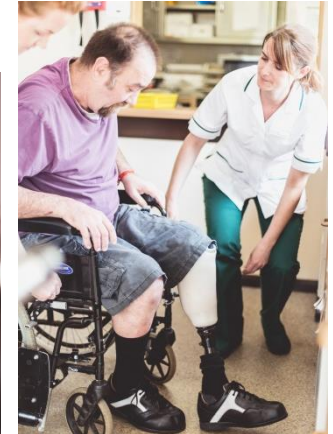
Service Manager for Neuromodulation

Berrywood Hospital

Northamptonshire Healthcare NHS Foundation Trust

OUR TRUST

- CQC rating of Outstanding.
- HSJ Trust of The Year.
- A diverse range of community, mental health and specialty services for adults and children.
- Users of patient and carer feedback tool – iWantGreatCare responding to 90,939 pieces of feedback since initiation.
- CQC report findings 2018 stated that the CQC were impressed by the trusts attitude towards innovation and service improvements.



(Cqc.org.uk, 2018)

Cqc.org.uk. (2018). *Northamptonshire Healthcare NHS Foundation Trust*. [online] Available at: <https://www.cqc.org.uk/provider/RP1>

#weareNHFT

OUR POPULATION



- Growing population of c.741k.
- Significantly higher rate of depression for people over 18 - 10.7%.
- Increasing demand.
- Aging population with increased long term health conditions.
- People with long term health conditions are three times more likely to develop mental health conditions.
- ‘Challenged’ health and social care economy.

The scale of the problem.

- PHE data reports the depression rate in over 18s is at 10.7%. This equates to 63,112 people approximately.
- Souery et al., (2007) found that up to 50% of people in a multi site study over Europe did not respond to two consecutive courses of antidepressant treatment.
- Similarly, Akil et al(2019), Fava(2003), Trevino et al(2014) also found 50 % of patients in a major depressive episode are characterised as Treatment Resistant.
- Within the locality 31,556 people will be diagnosed as difficult to treat depression or TRD.

Akil, H., Gordon, J., Hen, R., Javitch, J., Mayberg, H., McEwen, B., Meaney, M. and Nestler, E. (2018). Treatment resistant depression: A multi-scale, systems biology approach. *Neuroscience & Biobehavioral Reviews*, [online] 84, pp.272-288. [Accessed 22.05.19].

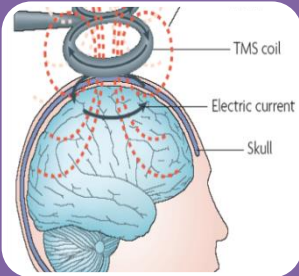
Souery, D., Oswald, P., Massat, I., Bailer, U., Bollen, J., Demyttenaere, K., Kasper, S., Lecrubier, Y., Montgomery, S., Serretti, A. and Zohar, J., 2007. Clinical factors associated with treatment resistance in major depressive disorder: results from a European multicenter study. *Journal of Clinical Psychiatry*, 68(7), pp.1062-1070.

Fava, M. (2003). Diagnosis and definition of treatment-resistant depression. *Biological Psychiatry*, [online] 53(8), pp.649-659. Available at: <https://pdf.sciencedirectassets.com/271200/1-s2.0-S0006322300X03927/1-s2.0-S0006322303002312/main.pdf> [Accessed 14 May 2019].

Trevino, K., McClintock, S., Vora, A. and Hussian, M. (2014). Defining treatment-resistant depression: A comprehensive review of the literature. *Annals of Clinical Psychiatry*, 26(3), pp.222-232.

<https://www.gov.uk/government/publications/wellbeing-in-mental-health-applying-all-our-health/wellbeing-in-mental-health-applying-all-our-health>

Treatment modalities.



repetitive Transcranial Magnetic Stimulation - rTMS



Ketamine Infusion



Electro-convulsive Therapy - ECT

Service Overview

Lorraine Bastick

Acting Matron Neuromodulation

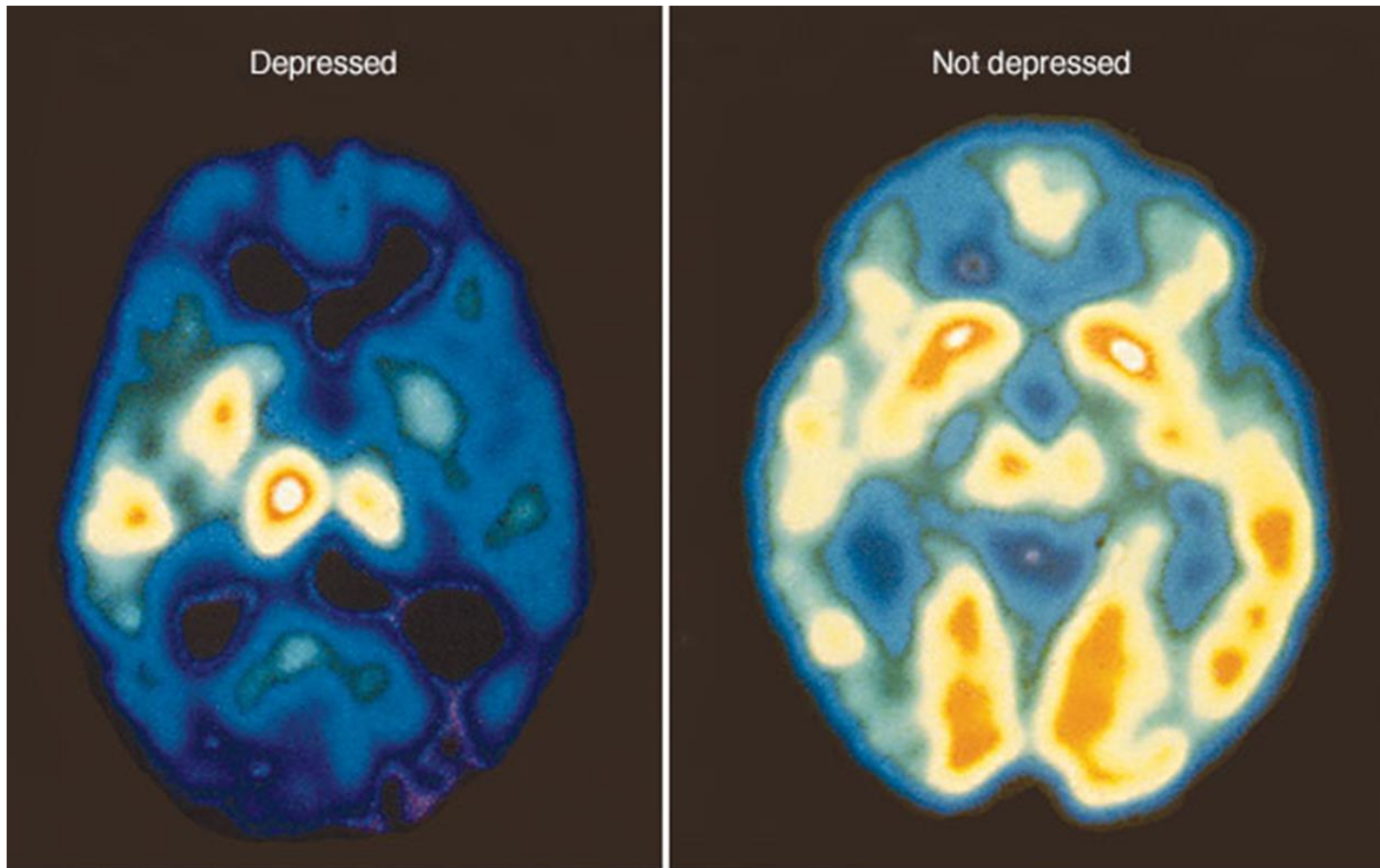
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Neuroanatomy of Depression

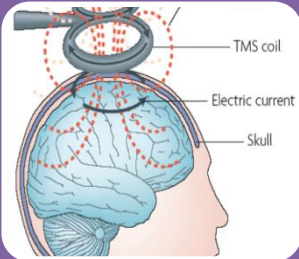
- Focus is shifting from correcting serotonin, dopamine and noradrenalin deficiency to enabling neuroplasticity.
- The circuit (network) involved in depression is thought to be on the left side of the brain, Dorsolateral Prefrontal Cortex, Prefrontal Cortex, Limbic system.
- These areas of the brain have been shown to be under-connected on the left using fMRI.

fMRI



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Treatments we can offer



Repetitive Transcranial Magnetic Stimulation rTMS

- Stimulating the neurons in the Brain
- Given daily over a 4 week period



Ketamine Infusion

- Affects the glutamate system in the brain
- Given by infusion at 0.5mg/kg over 40 mins for 3 separate infusions
- Response measured over the following 4 weeks after treatment



Electro-convulsive Therapy

- Stimulates the whole brain
- Given twice a week for 12 treatments if required

Ketamine Infusion Treatment

- Neuromodulation of NMDA neurones with ketamine causes release of brain derived neurotrophic factor and increased connectivity by causing increased sprouting of dendrites.
- Patients receive 3 treatments at a dose of 0.5mg/kg.
- At this point cognitive scores are reviewed to identify if there has been a response to the treatment.
- Followed by an MDT review to establish further treatment requirements.

rTMS

- TMS uses a small electromagnetic coil controlled by a computer program to deliver short, powerful bursts of magnetic energy focused precisely on the left side of the brain's frontal cortex.
- The TMS magnetic fields are the same type and strength as those produced by a magnetic resonance imaging (MRI) machine.
- Conventional and theta-burst treatment are administered in accordance with NICE guidelines. (NICE, 2015)
- In depressed brains the left PFC is under connected and the right PFC is over connected. Using left sided excitatory rTMS (waking/booting the network up) and right sided inhibitory rTMS can have an effective anti-depressant effect.
- Local clinical data indicates an approximate 60% response rate of these 30% total remission.

Patient Feedback

- More communication and verbalisation.
- Return of the ability to solve complex problems.
- Feel like a fog has lifted.
- Improved concentration
- Positive thoughts, thinking about activities.
- Depressed mood fades away.
- Sleep improved-Fitbit research project.

Impact of Neuromodulation on ECT Provision

Dr. Irfan Sabih

Anaesthetic Lead for ECT

Berrywood Hospital

Northamptonshire Healthcare NHS Foundation Trust

Electroconvulsive Therapy

- Over 80 years of experience in psychiatry.
- Nothing outperforms ECT nor rTMS or MST because it remains as effective evidence based intervention.

New Neuromodulation Procedures

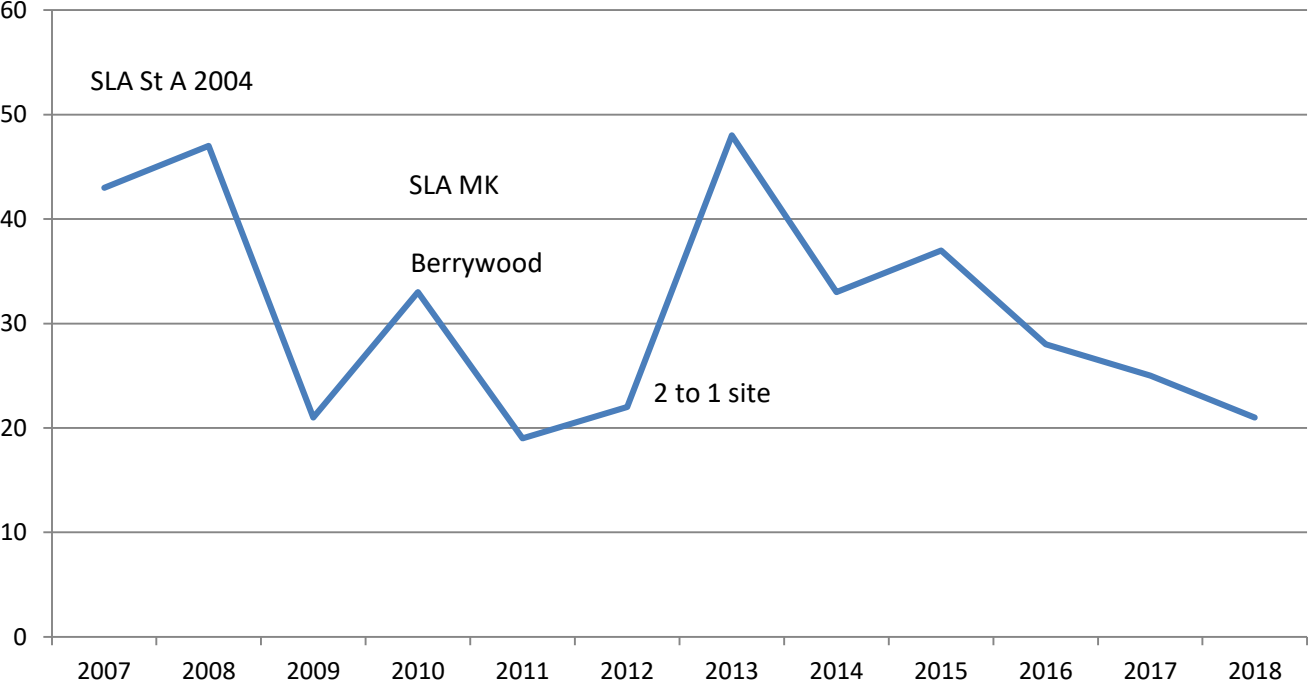
- rTMS.
- Ketamine Infusion.
- MST.
- Vagal Nerve Stimulation.

Key Figures

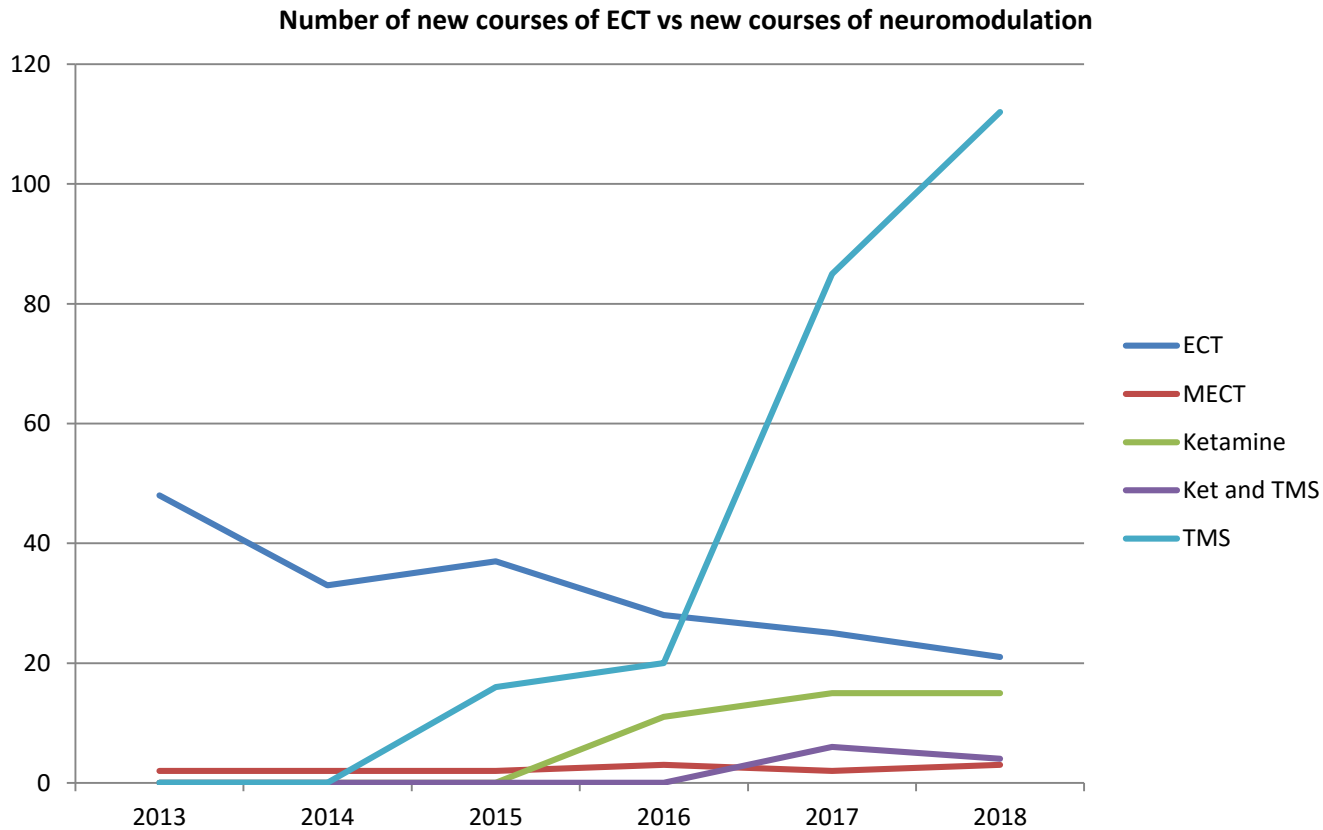
- In 2013, the number of patients being treated with ECT were 50.
- In 2016, Centre of Neuromodulation was opened.
- In 2018, the number of patients having ECT dropped to 20 a year.

Number of new ECT courses in Berrywood

Number of new ECT courses in Berrywood



Number of new courses of ECT vs new courses of neuromodulation



Recent Trends

- In the last 2 years there has been only one or two patients per session.
- There are periods of several weeks in 2018 when there were no patients for ECT.
- With the availability of Vagal Nerve Stimulation for patients receiving maintenance ECT, it is likely that the number of ECTs will further decline.

Future Changes

- Based on the trends detailed above it seems clear that:
 - ECT numbers may continue to decline.
 - Service may soon become non-viable and too expensive to run.

What is the alternative?

- Commission ECT from a nearby District General Hospital.
- Transfer staff from ECT to the Centre of Neuromodulation.

Challenges

- Commonly ECT is delivered on Tuesday and Friday mornings – would all DGHs be able to accommodate ECT twice a week easily considering their existing workload?

Suggestion

- Between 8:00 – 10:00, theatre recovery rooms are almost empty.
- Therefore, use theatre recovery bays to give ECT as they already have piped oxygen supply, required monitoring and recovery nurses.

Advantages

- Potential cost savings.
- Avoids risk of anaesthetic service on remote site.
- Unused space can be used for other neuromodulation facilities.
- Minimal staffing needed as ECT can be delivered by a junior doctor and a nurse from psychiatric hospital.

Downside

- Failure to meet ECTAS standard can compromise safety, quality and patient satisfaction.
- No direct consultant supervision so may affect quality of care.
- Lack of exposure of medical students and trainees to ECT means that these trainees would not consider ECT as a treatment option in the future despite its effectiveness.

Key Take away

It is true that the number of ECTs are in decline....

*But the fact of the matter is it is still used 80 years
on because evidence shows it is effective for
treatment-resistant depression*

AND

*“Although it may be moved from one site to
another, it will surely stay for many years to come”*

Please welcome Mark Liddell who will describe his experience as a patient of difficult to treat depression and rTMS treatment

Patient Experience

Mark Liddell

Service User of Centre for Neuromodulation

Berrywood Hospital

Northamptonshire Healthcare NHS Foundation Trust

Any Questions?