

Young Epilepsy

Young Epilepsy Health Services: Magnetoencephalography

Welcome to Young Epilepsy Health Services, part of Young Epilepsy which is the only UK charity dedicated to creating **better lives for children and young people with epilepsy** and related conditions.

Young Epilepsy is advancing the diagnostic experience for children with epilepsy. With our partners, we have created a wearable Optically Pumped Magnetoencephalography (OPM-MEG) system integrated into a magnetically shielded room, situated in our new diagnostic suite, complete with sensory garden. This will be the first wearable OPM-MEG system of its kind in the world and has the potential to transform the diagnostic experience for children and their families.



Once clinical evaluations are complete in autumn 2022, our goal is for this new technology to become part of the clinical offer at the Young Epilepsy Diagnostics Centre and begin to provide a service that was previously not available in paediatric epilepsy care.

This progress has been made possible due to an exciting collaboration with experienced MEG researchers, clinicians, and engineers from around the world.

We are very proud of the achievement we have made working with Magnetic Shields Ltd, University of Nottingham, University College London Institute of Neurology and the UCL Wellcome Centre for Human Neuroimaging.

This wearable OPM-MEG system overcomes the need for sedation, and/or the requirement for young patients to stay still during their scan. It has been developed to be significantly more accessible for children, particularly those with complex needs.

Our diagnostic suite has the advantage of a great location and special aesthetic design providing a calm, friendly and person-centred environment for young people and their families. The technology provides a far greater clarity of image to aid clinicians with their decision making. The combination of children being more relaxed, together with the richness of the data means that clinicians will have an improved chance of implementing earlier interventions and the best treatment pathways for each patient.

The Diagnostic team at Young Epilepsy includes:

- Clinical scientist
- Neurophysiologist
- Consultant paediatric neurologists
- Health care assistant
- Play therapist



What is the difference between a MEG and an EEG?

Whilst these imaging tools both measure brain function, they are very different, and each have a role to play in the diagnosis of epilepsy and choosing the right treatment pathway.

An **electroencephalogram (EEG)** is a recording of brain activity. During an EEG investigation, individual small sensors are attached to the scalp to pick up the electrical signals produced when brain cells send messages to each other. The scalp EEG can be distorted by tissue overlying the brain such as the skull and scalp.

A **magnetoencephalogram (MEG)** is similar to an EEG but it records the magnetic field generated by the electrical activity of communicating brain cells. Importantly, the MEG signal is not distorted by any overlying tissue. The MEG signal is acquired using novel sensors which are embedded into a purpose-built, child-friendly helmet. This new 'wearable' MEG system is a new generation flexible and highly sensitive diagnostic tool providing more accurate localisation of brain activity.

This medical breakthrough will achieve transformative change for the wider health sector when combined with structural magnetic resonance imaging (MRI) by making MEG an accessible brain imaging tool for the accurate diagnosis and evaluation of children and young people with epilepsy.

The clinical evaluation of this exciting new technology is due start in the autumn of 2021 and we plan to be accepting routine clinical referrals in 2022.

Young Epilepsy Health Services include:

- Autism diagnosis
- Behavioural assessments
- EEG and video telemetry diagnostic services
- Epilepsy nurse support
- Health training for parents, carers and professionals
- Rehabilitation
- VNS clinics

Where are we?

We are based at The Neville Childhood Epilepsy Centre in Lingfield, approximately 8 miles from M25 Junction 6. We are also easily accessible by train from London Victoria.

For further information please contact:

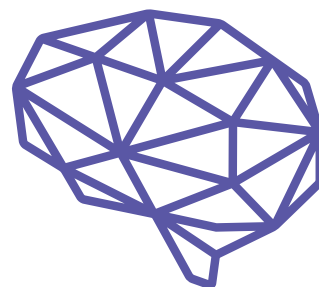
Young Epilepsy Health Services

St Piers Lane, Lingfield, Surrey, RH7 6PW

Tel: 01342 831203

Email: youngepilepsy.healthservices@nhs.net

www.youngepilepsy.org.uk



MEG

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