First UK trial of deep brain stimulation for children with epilepsy begins

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A teenager who is the first patient to take part in a UCL-sponsored clinical trial to use deep brain stimulation (DBS) to treat epilepsy has seen his daytime seizures reduce by 80%.

Oran, who had been having severe epileptic seizures for eight years and often needed resuscitation, was the first child in the UK to have this device implanted at Great Ormond Street Hospital in October 2023, when he was 12 years old. Now eight months on, his seizures have dramatically reduced in frequency and severity thanks to the device.

The rechargeable device is mounted onto the skull and is attached to electrodes deep in the brain to reduce seizure activity. This is the first UK clinical trial measuring this type of treatment for children with epilepsy.

The CADET pilot (Children's Adaptive Deep brain stimulation for Epilepsy Trial) will now recruit three additional patients with Lennox-Gastaut syndrome, before 22 patients take part in the full trial.

Martin Tisdall, (Honorary Associate Professor at UCL and Consultant Pediatric Neurosurgeon at GOSH), said, "Every single day we see the life-threatening and life-limiting impacts of uncontrollable epilepsy. It can make school, hobbies or even just watching a favorite TV show utterly impossible.

"For Oran and his family, epilepsy completely changed their lives and so
to see him riding a horse and getting his independence back is absolutely astounding. We couldn't be happier to be part of their journey.

"Deep brain stimulation brings us closer than ever before to stopping epileptic seizures for patients who have very limited effective treatment options. We are excited to build the evidence base to demonstrate the ability of deep brain stimulation to treat pediatric epilepsy and hope in years to come it will be a standard treatment we can offer."

The CADET Pilot and trial

Deep brain stimulation (DBS) is a treatment involving surgery to insert a small device which stimulates specific parts of the brain.

Unlike other DBS devices which are mounted on the chest with wires running up the neck to the brain, this device is mounted on the skull meaning the leads are less likely to break or erode as the child grows.

This device is also rechargeable through wearable headphones, which can be used while watching a video or interacting with a tablet. This also means it does not require surgery to replace it every three to five years.

Professor Tim Denison, University of Oxford and Royal Academy of Engineering Chair in Emerging Technologies, lead engineer said, "Our mission is to design pioneering research systems for exploring the treatment of intractable health conditions such as pediatric epilepsy. Oran is the first child in the world to receive this device and we are extremely pleased that it has had such a positive benefit for him and his family."

The device targets the thalamus, which is a hub for electrical signals in the brain. It is hoped that the device will block electrical pathways and consequently stop seizures from spreading. The device also has settings
for optimization towards seizure patterns, which although not utilized in this trial, could be used in the future for patients with LGS.

The CADET Pilot is a collaboration between UCL, GOSH, King's College London, the University of Oxford and a UK-based company: Amber Therapeutics.

Provided by University College London


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