



Non-invasive brain stimulation

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Talk Transcript

Hi, I'm **Eve Gregoriou** and I'm a researcher at the **UCL Institute of Neurology**.

In this short clip I will introduce you to **non-invasive brain stimulation**.

Non-invasive Brain stimulation is a set of **techniques** and **technologies** that have the ability to **change brain activity** without any **invasive** or **surgical procedures**.

It holds great **promise** as a **treatment add-on** for various **clinical disorders** such as **depression**, **epilepsy**, or **stroke**.

For example, some **studies** show that when **brain stimulation** is given **alongside physical therapy** after a **stroke**, it may **enhance** the **effects** of the **therapy**.

tDCS

A popular **method of non-invasive brain stimulation** is **transcranial direct current stimulation** or otherwise known as **tDCS**.

tDCS works by applying a **weak current** to the **brain** through traditionally **two electrodes** that are placed on the **scalp**.

During stimulation, **current flows** between the **electrodes** and **passes through** the **brain** to complete the circuit.

The key is that these **electrical currents** are very **weak**, and often **cannot be detected** by the person having tDCS which makes the technique **safe** and **well tolerated**.

Depending on **how we apply** the **stimulation**, we can sometimes **enhance brain activity**, or we can **inhibit it**.

This depends, for example, which **brain region** we **stimulate**, for **how long** we stimulate, **how strong** the stimulation is, but also **what** the **subject is doing** at the same time.

Research

Studies have also shown that when researchers **apply tDCS** in a certain way, they may have **long-lasting effects**.

This is an exciting prospect as it could equally mean that **tDCS** could produce **long-lasting therapeutic changes** in clinical disorders.

However, it has **not yet** been **clinically applied** as its **effects** are not always **consistent** and **reliable**.

And so, **tDCS** protocols are still being **explored** to gain more consistent effects in each of its applications and we hope that in the near **future** it will be more **routinely used** for **patient benefit**.

One way to do this is to use **computer models** and **simulations** that can tell us **where** in the **brain** we **deliver** the **current** to, and how we **change brain activity**.

In my own research, I am using these models to **improve tDCS** approaches for the use in **neurorehabilitation** in **stroke survivors**.

Thank you for listening to this brief introduction. If you would like to know more on our research and our Team, please visit our website.

Glossary

Non-invasive brain stimulation: a set of **techniques** and **technologies** that have the ability to **change brain activity** without any invasive or surgical procedures

Transcranial direct current stimulation (tDCS): A non-invasive brain stimulation technique where two small electrodes are placed on the head and a weak current flows between them.



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