



# Neurotechnology and Ethics

**For Prelims:** [United Nations Educational, Scientific and Cultural Organization](#), Neurotechnology, Deep Brain Stimulation, [Sustainable development](#), [Parkinson's disease](#)

**For Mains:** Ethical Concerns Related to Neurotechnology

## Why in News?

The [United Nations Educational, Scientific and Cultural Organization \(UNESCO\)](#) is organising an international conference in Paris, France to **address the ethical implications of neurotech devices that collect brain-wave data.**

- This **conference aims to establish a global ethical framework to ensure individual freedom of thought, privacy, and protection of [human rights](#).**
- With the growing potential of neurotechnology to address neurological problems, concerns have been raised regarding its impact on personal identity and privacy.

## What is Neurotechnology?

- **Neurotechnology** is defined as the **assembly of methods and instruments that enable a direct connection of technical components with the nervous system.** These technical components are **electrodes, computers, or intelligent prostheses.**
- They are meant to either **record signals from the brain and “translate” them into technical control commands,** or to manipulate brain activity by applying electrical or optical stimuli.
  - From **bioelectronic medicine that improves the quality of life to brain imaging that revolutionizes our conception of human consciousness,** this technology has helped us to address many challenges.
- Neurotechnology **encompasses all technologies developed to understand the brain,** visualise its processes and even control, repair or improve its functions.

## What are the Ethical Concerns Related to Neurotechnology?

- **Privacy Issues:** The **use of neurotechnology** can potentially reveal highly personal and sensitive information about an **individual's thoughts, emotions, and mental states.**
  - Combined with artificial intelligence, **its resulting potential can easily become a threat to notions of human dignity, freedom of thought, autonomy, (mental) privacy and well-being.**
- **Cognitive Enhancement and Inequality:** Neurotechnologies aimed at enhancing cognitive abilities raise concerns about fairness and equality.
  - If these technologies **become available only to a privileged few or exacerbate existing social inequalities,** it could lead to an unfair advantage for certain individuals or groups, **creating a "cognitive divide" in society.**
- **Psychological and Emotional Impact:** The ability to manipulate or access brain activity raises **ethical concerns regarding the psychological and emotional impact on individuals.**

- For example, **deep brain stimulation or neurofeedback** techniques may have unintended consequences or side effects on an individual's mental well-being, personal identity, or autonomy.

## What is Deep Brain Stimulation (DBS)?

- It is a **neurosurgical procedure** that involves the **implantation of a medical device called a neurostimulator**, which delivers electrical impulses to specific regions of the brain.
  - DBS works by altering the electrical signals in targeted brain regions, effectively "resetting" or normalising the neural activity
- DBS is primarily used to treat neurological conditions such as **Parkinson's disease, essential tremor, dystonia, and some cases of epilepsy and obsessive-compulsive disorder (OCD)**.
  - Parkinson's disease is a chronic, degenerative neurological disorder that affects the central nervous system.

## How can the Ethical Concerns Surrounding Neurotechnology be Resolved?

- **Informed Consent:** Ensuring that patients have a **comprehensive understanding of the risks, benefits, and potential outcomes** of neurological interventions is crucial.
  - **Healthcare** providers should engage in transparent and thorough discussions with patients, providing them with the information necessary to make informed decisions about their treatment options.
- **Ethical Review Boards:** Establishing **independent and multidisciplinary ethical review boards** can help evaluate the ethical implications of neurology research and interventions.
  - These boards should consist of **healthcare professionals, ethicists, legal experts, and patient advocates** who can assess the potential benefits, risks, and ethical implications of proposed interventions.
- **Maintaining Privacy and Confidentiality:** Safeguarding patient privacy and confidentiality is of utmost importance in neurology.
  - With the advancement of technologies like **brain-computer interfaces and deep brain stimulation**, it is crucial to implement robust privacy protocols and ensure that patients' sensitive information is protected.
- **Equity and Access:** Ethical concerns can arise when access to neurological treatments and interventions is limited by factors such as **cost, geographic location, or social disparities**.
  - Efforts should be made to promote equity and ensure that these **interventions are accessible to all individuals** who can benefit from them, regardless of socioeconomic status.

## What is UNESCO?

- **About:**
  - UNESCO is a specialised agency of the [United Nations \(UN\)](#). It seeks to **build peace through international cooperation in Education, the Sciences and Culture**.
    - Its **Headquarter is in Paris, France**.
- **Members:**
  - The **Organization has 193 Members and 12 Associate Members**.
    - UNESCO has announced that the **United States intends to rejoin the organisation and settle over USD 600 million** in outstanding dues
  - Membership of the United Nations carries with it the right to membership of UNESCO.
    - **States that are not members of the United Nations may be admitted to UNESCO**, upon recommendation of the Executive Board, by a two-thirds majority vote of the General Conference.
- **Objectives:**
  - Attaining quality education for all and lifelong learning
  - Mobilising science knowledge and policy for [sustainable development](#)
  - Addressing emerging **social and ethical challenges**

- Fostering **cultural diversity, intercultural dialogue and a culture of peace**
- Building **inclusive knowledge societies through information and communication**
- Focuses on global priority areas - **“Africa”** and **“[Gender Equality](#)”**.

## UPSC Civil Services Examination Previous Year Question (PYQ)

**Q.** What are the aims and objectives of the McBride Commission of the UNESCO? What is India's position on these? **(2016)**

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