Mental illness diagnostics

A new, rapid, low-cost diagnostic tool that focuses on genetic and neurochemical correlates of symptoms.

Medical models of mental illness may reduce self-blame and increase seeking treatment, but reduce a person's belief in their own autonomy.

Cognitive enhancement drugs

Readily available drugs for boosting memory and attention; intended for patients with neurological conditions but used more widely.

Drugs originally prescribed for brain disorders may lead to interventions for enhancement, with questions of access and fairness, and pathologization of normal aging.

Public brain data

A large scale neuroimaging study to understand language development that will produce a publicly available brain data set.

Studies of healthy individuals require trust in medical research systems, potentially valuing societal over individual benefit. As large datasets are shared, there are also issues of data privacy and consent.
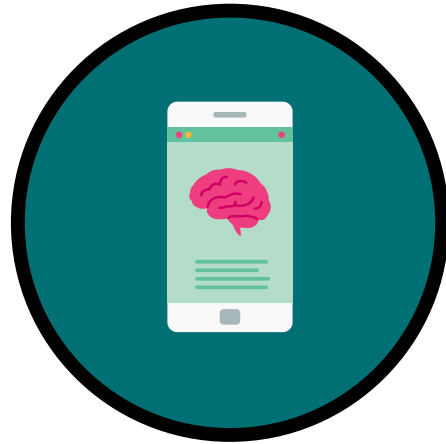
Online brain donor registration

A new social network initiative using online sign-ups for donating human brain tissue as social currency.

Organ donation can help advance brain research but can also be at cultural odds with the value of bodily integrity after death.

Facial emotion detection

New security cameras with advanced facial recognition software to detect emotional states, based on publicly available brain data.

Machine learning and facial recognition are more frequently being used for public safety technology, but raise questions of privacy and could be manipulated for malicious use.

Advanced prosthetic limbs

Prosthetic limbs with better neural control that also have more strength than their human equivalents.

The direct interaction between the brain and a machine blurs the lines between tool and body part, treatment and enhancement.
Do assistive technologies reinforce a "deficit model" of disability?
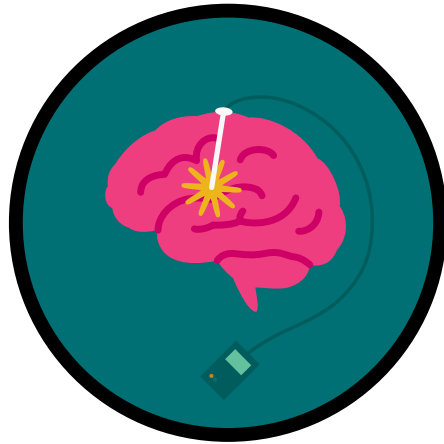
Brain stimulation therapies

A minimally invasive deep brain stimulation (DBS) system, intended for treatment of Parkinson's or other movement disorders, could also alter mood.

DBS delivery through less invasive techniques could increase treatment options for patients in need, but could also introduce additional use outside of the clinical space.
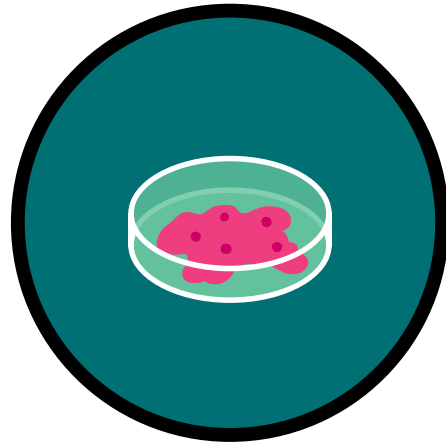
Personalized brain stem-cell testing

Procedures for growing brain organoids, or "mini-brains," from patient stem-cells that allow testing for Alzheimer's or autism spectrum disorder.

Predictive testing impacts the perception of what diseases people think they will develop and who they might become. Who decides the minimum features of cellular systems for moral considerations—scientists or public perception?

Nontherapeutic brain testing

Rapid biomarker testing and brain scanning technology used to identify impulsive behaviors during popular courtroom TV shows.

While biological standards and legal standards differ, neuroimaging and other biomarker data still influence public perception and could affect the attribution of personal responsibility.

Non-human primate model for neurological condition

Research on transgenic macaques using implanted cortical electrodes could lead to new therapies for a debilitating neurological condition in humans.

The lack of analogous brain structures in lower vertebrates means there are no other options for live animal testing, but there are ethical concerns about intentionally causing suffering in animals.