

This response was submitted to the consultation held by the Nuffield Council on Bioethics on *Novel neurotechnologies: intervening in the brain* between 1 March 2012 and 23 April 2012. The views expressed are solely those of the respondent(s) and not those of the Council.

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I have read with interest the report as it poses some very important questions. My name is Dr Andrea Malizia, I am a psychiatrist with a special interest in the use of neurosurgery for severe and chronic treatment resistant depression. I am a member of a number of professional associations. Here I comment as an individual and a professional who feels strongly that people who are severely disabled by a psychiatric disorder, for example major depression, are discriminated against because of the lack of 'real world' understanding of how disabling this condition is.

My response is articulated in three parts. I understand that this is over and above what is asked of a commentator however some of the points are so cogent to the debate that they need to be raised. The three parts are:

1. comments about the document in itself
2. response to the questions posed in the document
3. suggestions for other ways to harness opinion that may be constructive

Comments about the document in itself

In the opening statement the document states:

“During the last century, brain intervention experienced a steep rise and fall: electroconvulsive therapy (ECT), ‘split-brain’ surgery and lobotomy were each first heralded as a wonder cure for epilepsy, depression, schizophrenia and many other illnesses in the first half of the 20th century. But each was to some extent discredited only a few decades later as they came to be seen as treatments that were often inappropriate and sometimes harmful, leading to the view that their uncritical and widespread use arose from the hubris of a medical profession bound by too few rules”

Let me start by saying that abuses and lack of informed consent are to be deplored whatever the intention of the perpetrator. However the report seems to ignore the fact that both neurosurgery and ECT for severe psychiatric disorders emerged at a time when there were no effective pharmacological treatments and the reason that they had a big impact was that they were clearly effective in a number of people. Two of the above treatments have evolved and are still useful in spite of the success of medication

- ECT is still used for severe major depression and there is no treatment that is as efficacious in getting a person out of an episode of severe major depression. This is reflected in the various guidelines produced by NICE, Royal College of Psychiatrists and in the opinions of service users' on line support groups (<http://www.dailystrength.org/>) where almost two thirds of comments were positive in spite of the reported increased memory disturbance. The tragedy of this treatment is that it is still regarded as controversial, that very little public funding has been made available to sort out the issues that people and clinicians worry about and most importantly that it is not offered enough to people in need where it could quickly dissipate profound suffering.
- Lobotomies evolved to stereotactic neurosurgery for mental disorders in specific targets. This surgery is used little compared with the number of people who are severely disabled by depression and can still offer restoration to health (eg <http://www.bbc.co.uk/news/health-12274271>). The side effects of early procedures are virtually non-existent with current procedures and in this country access is supervised by the Care Quality Commission that certifies the veracity of consent.

When the report talks of hubris of the medical profession, it ignores the fact that most clinicians (especially in the UK) have used these tools sensibly and responsibly in a way that saved lives not only in terms of decreased suicide risk (Hussain et al 1988, J Neurol Neurosurg Psychiatry 51 345-352; Bridges et al, Br J Psychiatry 1994 Nov;165(5):599-611; discussion 612-3) but also in terms of restitution to a fuller life (Tan et al, Br J Psychiatry 1971 118 151-164) and reduction in disabling anxiety (Marks et al, Br J Psychiatry 1966, 112:757-769).

It is thus disappointing that the opening page of such an important document that will provide guidance and information for the future fails to maintain a balanced view about the past and chooses a confrontational approach.

There are a number of technologies that are not discussed and yet are as close to be implemented as implanted BCIs. These are nanotechnology (in excess of BCI interface eg nanotubes, transmit devices), optogenetics, laser signalling and targeted delivery of eg growth factors (already achieved eg Gill et al Nat Med. 2003 May;9(5):589-95).

There are a couple of inexact statements regarding DBS:

- DBS leads are often inserted under local anaesthesia

- In conditions such as major depression, the adjustments required can take many visits over a prolonged time
- One of the current issues with DBS is that technology has not advanced *pari passu* as the advances in eg cardiac pacemakers. So the devices themselves don't have the degree of flexibility, miniaturisation and electric longevity as it would be desirable in 2012
- Other indications for DBS are emerging such as treatment resistant epilepsy, Alzheimer's disease, addictions and intractable hypertension.
- In addition there is no mention of Obsessive Compulsive Disorder where there are the only papers that demonstrating DBS efficacy in a double blind design (Denys et al Arch Gen Psychiatry. 2010 Oct;67(10):1061-8; Goodman et al Biol Psychiatry. 2010 Mar 15;67(6):535-42). Please note that attempts at blinded discontinuation of DBS in depression have lead to increased suicide risk.

The current evidence for rTMS suggests that it is not remotely as efficacious as ECT in depression. However, it may well be that it will find its place early in treatment algorithms for major depression once two antidepressants and CBT have failed.

There is no mention of the use of stem cells for multiple sclerosis.

A book was published in 2011 that collects the opinions of a number of senior authors on the ethical issues of enhancement. It is worth reading if the committee has not seen it.

The reference is

Enhancing Human Capacities [Julian Savulescu](#) (Editor), [Ruud ter Meulen](#) (Editor), [Guy Kahane](#) (Editor) ISBN: 978-1-4051-9581-2 Hardcover 576 pages March 2011, Wiley-Blackwell

Response to the questions posed in the document

I have used your document for this

Suggestions for other ways to harness opinion that may be constructive

Involve patient organisations eg Parkinson's society, local NHS fora and patient advocacy services. Consult lawyers who act for clients dissatisfied with the treatment received or with access to treatments.

Make sure you get patients' opinions from people who have experienced the treatment in question

Rules for the use of the aforementioned technologies should be determined by the opinion of the people of a country. Since laws and practices differ a lot, relevant qualitative research must be carried out at grass root level separately from pressure groups that have their own voice but are unlikely to evaluate new evidence fairly. The capacity of people to comprehend the issues and respond is well developed if they are given the relevant information presented in a balanced way- to this end participatory action research like citizen's panels/juries.

For example I would object to the development of invasive BCIs for gaming and would be concerned about the extensive use of external connection by younger people; however I am sure that many people would have the opposite opinion, backed up in some cases by valid arguments. We would have to understand what society at large thinks about it, once the information has been appropriately delivered and digested by the research participants.

General questions

1. Have you ever used a technology that intervenes in the brain, and with what consequences? Please describe your experience.

Yes. Excluding pharmacological agents, it includes ECT, neurosurgery for mental disorders (NMD) and deep brain stimulation (DBS), mostly for severe treatment resistant depression.

When witnessing their positive effects for the first time I was somewhat incredulous but many people describe the effects as “being themselves again” after being “alive but dead inside” and disabled for a number of years. The techniques don’t work in at least a third of cases, however this compares extremely favourably with other medical treatments in people with severe and chronic illness and disability.

2. If you have not used a technology that intervenes in the brain before, would you do so if you were ill? Why / why not?

I would use the above for myself and for my relatives. I would wish to know that I can make my own choice without medical paternalism or societal prejudice.

3. Would you use a technology that intervenes in the brain for non-medical purposes, such as gaming or improving your cognitive skills? Why / why not?

Definitely not!

4. What are the most important ethical challenges raised by novel neurotechnologies that intervene in the brain?

Making sure that they are acceptable to society, that regulation does not unfairly restrict individual rights and most of all for medical applications that mechanisms AND resources for transparency and evaluation are in place. The example of the MRC Concorde trial on AZT, or some of the ECT v “sham” trials should be considered when assessing information early on.

5. In what ways, if at all, should the development and use of these technologies be promoted, restricted and/or regulated? Please explain your reasons.

I think this is a good question for participatory action research (PAR). Medical research is as usual regulated by ethics committees who should be able to rely on expert advice when none is available locally.

Questions

Please be specific with regards to the type of BCI you are referring to in your answer

6. Have you used a BCI, and if so, with what consequences? Please describe your experience.

No

7. If you have not used a BCI before, under what circumstances would you do so?

Cant think of one at present

8. What are your expectations and concerns for BCIs?

Inappropriate military use- where is the acceptable boundary. For me OK in helping someone fly a plane or remotely assess a dangerous situation. However the notion of being more efficient in killing others is worrying.

I don't understand the pros and cons for gaming

For medical devices the important element will be the failsafe mechanisms and cost-utility functions.

9. Are there any particular ethical or social issues associated with BCIs?

Yes of course

10. What would robust and effective regulation of research in this area look like? Is more or less regulation needed? Please justify your response.

Again I think this is one for PAR

Questions

Please indicate which technology (TMS, DBS) you are referring to in your answer

11. Have you used neurostimulation and if so, with what consequences? Please describe your experience.

Yes and it changed life for some people but it was also laborious, not free of side effects and potentially dangerous if it fails when people have already responded

12. If you have not used neurostimulation before, under what circumstances would you do so?

13. Under what circumstances do you think it might be acceptable to use neurostimulation in non-medical context (that is to say, not for the treatment of a disease or disability)?

Currently none.

14. Are there any particular ethical or social issues associated with neurostimulation?

15. What would robust and effective regulation of research in this area look like? Is more or less regulation needed? Please justify your response.

I would not object to regulation of DBS for major depression or OCD (as is the case for ablative neurosurgery) if any brain condition i.e. epilepsy, Parkinson's, dementia, dystonias and pain were also regulated in the same way. Otherwise it is discriminatory to people with mental illness and unjustifiably separates mental illness from other brain disorders

Questions

16. Under what circumstances would you use neural stem cell therapy?

If it was shown to be effective in degenerative disease with risks worth taking

17. What do you think of the risks and benefits of neural stem cell therapy?

Currently the risks override the benefits but it will change

18. Are there any particular ethical or social issues associated with neural stem cell therapy?

None for these terms of reference. Lots regarding provenance of stem cells.

19. How do you feel about neural stem cell therapy being used for non-medical purposes one day, for example for human enhancement?

On current knowledge it would be unacceptable; but willing to hear the specific arguments

20. What would robust and effective regulation of research in this area look like? Is more or less regulation needed? Please justify your response.

Again something for PAR.