

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.

## **British Medical Association**

### **Nuffield Council on Bioethics. Novel neurotechnologies: intervening in the brain. Consultation response from the British Medical Association**

#### **Introduction**

Thank you for forwarding a copy of the Council's consultation on novel neurotechnologies to the BMA for comment. The BMA does not currently have explicit policy on the issues raised by the consultation. This is partly because some of the potential therapeutic uses of these emerging technologies are highly speculative and partly because the ethical issues arising from research into these technologies and their therapeutic applications are not obviously different in kind to other medical interventions. In 2007 the BMA published a discussion paper on the ethical aspects of cognitive enhancement.<sup>1</sup> The aim was to facilitate informed debate among medical, scientific and policy-making audiences, and more widely among the public. Along with a wide variety of technologies that may have the potential to enhance 'ordinary' human functioning, it discussed the use of deep brain and transcranial magnetic stimulation and the use of brain-machine interfaces. Although this is a fast-evolving area of enquiry, many of the ethical issues raised in that document remain relevant and these are highlighted in brief below. For further information, please consult that document directly.

The majority of the questions in the consultation document are not relevant to the BMA and we have concentrated on the following:

- What are the most important ethical challenges raised by novel neurotechnologies that intervene in the brain?
- In what ways, if at all, should the development and use of these technologies be promoted, restricted and/or regulated?

#### **Background**

It is widely recognised that developments in neuroscience are enormously enriching our understanding of the functioning of the human brain and its relation to human mental phenomena. These developments are in turn generating considerable excitement about possible future therapeutic interventions to address a wide range of debilitating physical, psychiatric and neurological disorders. The close link between the brain and the human personality has also led to concerns that there may be a less-welcome side to neuroscientific discovery. Difficult questions are being raised about the personal and social implications of unpicking the biochemical basis of the self and the impact of neuroscience on concepts of human freedom, agency, dignity and responsibility. As with the discoveries themselves, the development of novel neurotechnologies is being met with a mixture of optimism and caution. Brain computer interfaces (BCIs) may in the future support and extend the lives of people with profound physical impairments and deep brain stimulation has improved the quality of lives of people suffering from Parkinson's disease. But the possibility of direct intervention in human brains to alter socially proscribed characteristics or personality traits raises profound and troubling ethical concerns.

As a professional association for doctors, the BMA's primary interests are with the medical applications of these neurotechnologies. In the BMA's view, ethical issues concerning research into neurotechnologies and their trialling in human subjects are not in themselves novel - the ethics of

medical neuroscience do not differ in substance from more established medical ethics. More controversial is the neuroscience of ethics – the impact of neuroscience on our understanding of what it is to make ethical choices and, ultimately, our understanding of what it is to be human. These issues involve complex and possibly unanswerable philosophical questions about the relationship between the mind and the brain and although we discuss them briefly below the BMA is not in a position to comment on them in detail.

The use of these technologies does however have important public policy ramifications. Media presentation of novel neurotechnologies, particularly where they have therapeutic uses, or have been developed from technologies designed for therapeutic applications can have a significant impact on the public's understanding of medical science and on public confidence in medicine and medical science more widely. As a professional association the BMA is committed to ensuring that public debate on medicine and the allied sciences is open, informed, measured and evidence-based. As the principal seat of human identity and personality the human brain could be argued to have particular status. Careless or sensationalist reporting of developments in neuroscience can lead either to demonization and distrust or to unfounded optimism. Although developments in neuroimaging techniques and brain mapping are exciting, their current therapeutic applications remain limited and the expectations of those who suffer from or care for those who suffer from mental or neurological disorders need to be managed sensitively. It is important to distinguish between what is realistically possible in the short term and what is speculative. Media handling of the debate will also be critical to future policy in this area.

### **Medical ethics and the challenges raised by therapeutic neurotechnologies that intervene in the brain**

As with any novel therapeutic intervention, the development of neurotechnologies in order to provide relief from suffering must be subject to rigorous ethical appraisal and oversight. Put briefly, the goal of medical intervention is to provide maximum health benefit with minimum harm in accordance with the autonomously expressed preferences of individuals and in ways that are just. Where individuals lack autonomy, decisions will ordinarily be based on assessments of their interests broadly conceived. The fact that the focus of neurotechnological interventions is the human brain does not alter this fundamental ethical requirement. When considering the application of novel neurotechnologies, critical issues will therefore be the likely anticipated benefits and harms of the interventions and ordinarily these will be assessed on a case by case basis. Each of the technologies discussed in the consultation document have different potential risk and benefit profiles based upon factors such as their intrusiveness and the nature and scope of their anticipated side effects. The BMA is not a clinical body and we are not in a position to comment on the specific clinical aspects of the various technologies. Assessment of these factors will nevertheless be critical to decisions about their implementation.

Given the burden associated with some psychological and neurological disorders and the radical restriction of ordinary human functioning that they can entail, there may be some justification for accepting larger than ordinary risks. The ethical assessment would not be different in kind to any intervention designed to treat serious health problems – in certain circumstances treatments aimed at curing or ameliorating life-limiting disorders such as cancer might justify the use of interventions with significant associated risks. Severe illness can render people extremely vulnerable. When faced with the prospect of death or serious illness, the offer of hope can also be coercive. Although these factors may not necessarily undermine decision-making capacity, considerable care has to be taken to ensure that decision-making is based as far as reasonably possible on an informed understanding of the likely benefits and the potential harms.

Long before licensed therapeutic interventions are developed, extensive research into their application will be required. There is nothing intrinsically novel about neurotechnological interventions. In accordance with international codes governing biomedical research, the wellbeing of research subjects

is critical and any risks must be kept to a minimum, particularly where the research is not expected to deliver therapeutic benefits to individual research subjects. Where therapeutic benefits are anticipated, risks must not be excessive in comparison with those benefits. As with innovative therapeutic interventions, consent to enrolment must be carefully managed. Considerable care must be taken to ensure the voluntary involvement of research subjects. Where individuals lack capacity to consent to enrolment then in accordance with national and EU regulations, risks must be kept to a minimum and the research should be related to the disorder from which the incapacitated adult is suffering. Research involving incapacitated adults should only take place where it is not possible to enrol an adult with the capacity to consent.

### **Non-therapeutic uses of novel neurotechnologies – ethics and public policy**

Although as a professional association for doctors the BMA's primary interest is with the therapeutic possibilities of new technologies, the border between medical and other applied uses of these technologies can be blurred. While the possibility that developments in the understanding of the brain might lead to new treatments for mental disorders such as schizophrenia or disorders of age-related neuro-degeneration such as Alzheimer's Disease is tremendously exciting, other implications are potentially more troubling. Defence attorneys in the US for example are already submitting neuroscientific data from brain imaging in an attempt to mitigate sentencing. The idea of a direct causal link between certain identifiable brain states and intentional action raises very difficult questions about determinism, agency and culpability. These in turn may have a significant impact on central ethical concepts in medicine such as autonomy, mental capacity and informed consent. Neuroscience can also throw into question deeply held commonsense beliefs about personality and identity as well as potentially undermine normative concepts such as human dignity and integrity. Although much of the work here is highly speculative and some commentators remain unconvinced that neuroscience will lead to a paradigm-shift in our self-understanding, the impact of new technologies on public confidence in science, and in the belief that science can protect rather than undermine our dignity and wellbeing needs to be carefully assessed.

As mentioned in your consultation paper, among the many possible uses of novel neurotechnologies is to enhance 'ordinary' human neurological functioning. In its work on ethical issues associated with cognitive enhancement, over and above the calculus of direct benefits and harms to individuals subject to the technology the BMA identified a number of ethical issues and these are set out briefly below.

#### *Equity*

The use of neurotechnologies for non-therapeutic purposes such as cognitive enhancement can raise questions of social equity. If enhancement technologies begin to deliver significant benefits to enhanced individuals – performing better in the education system, securing access to better universities and achieving more highly in the work place, then the question of who gets access to enhancement will become important. Should the market be allowed to govern distribution, therefore potentially giving further advantages to the wealthy or should the equity costs mean that they are distributed equally through state subsidy? Although the BMA does not have a position on these questions, if neurotechnology begins to offer the ability significantly to enhance cognitive functioning, they will be critical to any future policy response.

#### *Social solidarity*

Linked to equity is the concept of solidarity. Although not easily defined with precision, solidarity refers to the strength of those common bonds that join members of specific groups in the pursuit of shared goals and in the provision of mutual assistance in the face of life's burdens. In the UK health context, the NHS is often put forward as a prime expression of social solidarity – the mutual provision of an insurance policy to mitigate against the unequal burdens of ill health. If the potential benefits of neurotechnologies are inequitably distributed, they could put pressure on solidarity. Where an already

advantaged minority can afford access to neuro-enhancing techniques, for example, social divisions could be further widened.

### *Choice and coercion*

The ability of neurotechnologies to enhance ordinary capacities also raises the possibility that individuals may feel under pressure to make use of them. Stigma may also be attached to those who choose not to use enhancements, preferring to remain in a 'natural' or unenhanced condition. In a competitive educational environment parents may also feel some pressure to enhance their children in order to give them a reasonable chance to compete on an even footing. Individual occupational groups – members of the military, airline pilots – may also come under pressure to take advantage of neurotechnologies in order to improve performance or enhance public safety. Some commentators have also speculated that were moral enhancement – the use of neuro- or other technologies to reduce or remove morally undesirable traits such as aggression – to become possible, then they should become compulsory.

### *Humanity, dignity and personal identity*

As mentioned earlier developments in neurotechnology have given rise to a variety of related concerns that cluster around concepts of human personality, dignity and moral agency. Most moral traditions see at least some part of the value of human persons as stemming from concepts such as freedom of choice, the acceptance of personal responsibility and the self-fashioning of our lives towards ends we regard as good or desirable. Given that the seat of these defining human qualities is understood as residing in the biochemistry of the brain, and that neurotechnologies hold out the prospect of altering this chemistry, it is not surprising these technologies are giving rise to concerns about the loss or transformation of fundamental human characteristics. This is an area in which scientific and philosophical speculation runs considerably ahead of practical application and this is not something that the BMA has policy on. Should it become clear that neuroscience and the technologies it is giving rise to are beginning to have a direct impact on these fundamental human concepts and opening them up for re-fashioning, then the case for ethical oversight and, possibly, regulation is likely to be strong.

### **A case for regulation?**

The question of whether neurotechnologies should be subject to regulation – above and beyond the regulation, for example, that already applies to the use of innovative medical technologies – will largely depend upon the potential harms associated with them and upon whom those harms fall. Where new technologies present a range of harms and benefits to the individuals who use them, then, within reason, liberal societies operate on the presumption that competent and informed individuals are generally best able to make their own decisions. Cosmetic surgery, for example, has risks associated with it yet within a carefully regulated delivery system, individuals are free, within limits, to decide for themselves whether the potential benefits exceed the risks. Having said this, in some areas of health technology, such as assisted reproduction, additional regulation has been thought necessary. In addition to protecting the interests of those who decide to use the technology, regulation can also create public confidence in the technology and ensure that, as far as possible, wider social interests engaged by the practice are protected. The public interest in reproductive technologies, the ethical issues they give rise to, the wellbeing of women using the technologies and the wellbeing of the children that may be born as a result of these technologies were significant enough to warrant regulation. Where individual use of technology may harm others, the case for regulation is stronger – the use of firearms for example is very heavily controlled in the UK. In the end, the decision as to whether new technologies should be governed by statute or whether they can reasonably be left to guidance or self-regulation is a matter for Parliament. These decisions will usually depend upon a range of factors including an assessment of the potential risks and benefits, the extent to which those using the technologies may be liable to harm others, the potential risks of misuse and their impact on

social cohesion and norms. The nature and purposes of the physical interventions outlined in the consultation paper differ considerably and it is unlikely that a single regulatory system would be appropriate. On the face of it, it is not clear that the specific therapeutic uses of the new technologies requires additional regulation. Should the potential for significant cognitive, and even moral enhancement become realistic, then the need for some forms of regulation would need to be seriously considered.

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<sup>i</sup> British Medical Association. *Boosting your brainpower: ethical aspects of cognitive enhancement – a discussion paper from the British Medical Association*. London: BMA, 2007. [http://www.bma.org.uk/ethics/health\\_technology/CognitiveEnhancement2007.jsp#.T5kMPNmh02I](http://www.bma.org.uk/ethics/health_technology/CognitiveEnhancement2007.jsp#.T5kMPNmh02I). Accessed 26 April 2012.