# ETHICAL, LEGAL AND SOCIAL ISSUES IN NEUROSCIENCE RESEARCH

## A CONSULTATION PAPER

BIOETHICS ADVISORY COMMITTEE
SINGAPORE

**Please refer below to answers in Blue.**

**Should persons lacking mental capacity be included in research other than clinical trials? If so, under what conditions?**

47. Based on the principle of respect for persons, informed consent from participants is a fundamental requirement in human biomedical research. However, obtaining informed consent could be a major challenge in neuroscience research, because research participants may be patients with neurological or psychiatric disorders, some of whom are particularly vulnerable, and protecting them requires special consideration. If the patients are either cognitively or emotionally impaired, they may not fully understand what they are consenting to, or they may be particularly susceptible to inducement or coercion.

48. Currently, according to the Mental Capacity Act (Cap.177A, revised 2010), only a donee who has been expressly given authority under a Lasting Power of Attorney (LPA) to give or refuse consent to the carrying out or continuation of medical treatment by a health care provider, or a deputy appointed by the court under the Act, may decide on the person's participation in clinical trials. In making such decisions on personal welfare, the deputy or the donee must follow the statutory principles under the Act, viz., act in the person (donor)'s best interests, have regard to the guidance in the Code of Practice of the Act, carry out the donor's instructions and make decisions within the scope of authority specified in the LPA. To give consent for the person lacking capacity to participate in clinical trials, the deputy or the donee must be satisfied that:
    (a) The individual has previously indicated a willingness to participate; or
    (b) Consent would, in the judgement of the deputy or donee, have been given had the individual (not being a child), been able to make an informed choice.

49. Biomedical research other than clinical trials is not covered under the Act. A deputy or donee is obligated under the Act to put the best interests of the person whom he is responsible for first, but participation in research, particularly nonclinical studies, does not usually benefit the participant directly. Consequently, consenting to participation in research on behalf of a non-competent person cannot be defended as in the person's best interest if no clinical trial is involved, since there is no reasonable expectation of direct benefit for the person.

50. But on the other hand, there is also much valuable research, outside the category of clinical trials, that would benefit persons lacking capacity as a class, and may subsequently lead to developments that are beneficial on an individual basis. For instance, genomic research may identify genetic variants that might reveal one's predisposition to developing neurological disorders, or how one's uptake or metabolism of neuropharmaceuticals may vary. Such research may be impeded if persons lacking mental capacity are not permitted to participate. Moreover, these research may pose less risk to the participants than clinical trials, which are usually of higher risk to participants because of possible adverse effects of the tested intervention. Arguing from the principle of proportionality, if persons lacking

capacity can participate in clinical trials, their involvement in research that carries less risk should also be acceptable. Therefore, should provisions be made to allow for proxy consent for these persons to participate in research that is not a clinical trial? Can potential benefits for a class of persons be a criterion for permitting research that would be of no direct benefit to the participants? If so, who may give consent on behalf of persons lacking capacity, and what safeguards should be in place to ensure the protection of these participants?

51. Moreover, since not all persons lacking mental capacity would have an LPA, should proxy consent also be allowable for participation in clinical trials that pose low risk, such as clinical trials on locally registered drugs or their congeners (i.e. variant drugs which are structurally similar to an approved drug), in the absence of an LPA?

**Response from AWARE**

A person with lacking mental capacity could participate in research if:

- Consent is obtained via processes established in the Mental Capacity Act. Steps must also be taken to ensure that the individual, or the donee or deputy representing the individual is made fully aware of the purpose of the research, the procedures and all side effects, if any.
- The research must have some basis or motive that will benefit persons lacking capacity as a class
- The individual's dignity remains intact and the individual is not to be placed at risk. There must also be a guarantee that someone other than the investigator will assess the risks of the proposed research.
- Safeguards are in place for foreseen and/or unforeseen negative implications that the individual may encounter as a result of participating in the research. These safeguards can be in the form of compensation or coverage of medical expenses. The individual should be covered both during the period of the research and after the completion of the research.
- The individual is free to opt out of the study at any time

**Should children be included in research involving the use of neurotechnologies? If so, under what conditions?**

64. Children are recognised as a vulnerable population, deserving special consideration to ensure that their welfare and well-being are adequately protected when participating in research, as in many other aspects of life as well. Issues of consent, and acceptable levels of risk (in relation to the expected benefits, both for the individual and society) are some matters raised by research involving children. The long-term effect that neurotechnologies may have on their developing brains is a serious concern. Should children, particularly healthy ones, be involved in research with neurotechnologies? What are the factors for consideration? On the other hand, if such experiments are not conducted at some stage, how will it ever be known whether such interventions are safe for them?

65. Should non-invasive neurotechnologies be used for non-medical purposes by children? There is a concern over the increasing use of neurohancing pills or "smart drugs" by students,[32] with the hope of improving their examination scores. Given the lack of rigorous scientific testing, it is questionable if these drugs really do make one "smarter",

and if so, what is their mechanism of action. As these drugs have uncertain side effects and unknown long-term impact on the brain, should its use in children be restricted? Do taking these pills amount to "cheating", and should these pills be banned for students taking examinations like some drugs in competitive sports? It has also been questioned if there is any difference between using neuroenhancers and other methods of improving alertness or cognitive skills, such as drinking coffee or having tuition. There are further concerns that weaker students may be "coerced" into taking these "smart" pills as a result of peer pressure, or even by their parents due to societal pressures. As indicated above, these drugs are not without side effects. Whose responsibility is it to educate the public on these matters; what is the government's role? Should the non-medical use of neuroenhancers be regulated? If so, how? Similar questions can be asked for cognitive enhancement through non-pharmacological methods such as TMS.

**Response from AWARE**

The same criteria must be considered for children as stated above, with additional precautions including:

- Consent for participation should be given by the child itself and both parents and/or legal guardians and not only one parent as currently stated in the MCA
- The age of child should be defined according to the United Nations Convention on the Rights of the Child.
- Neurohancing pills could be listed and regulated under the same laws for drugs/medication and therefore should not be allowed for children unless otherwise advised by a medical professional.
- If the effectiveness of the drugs/"smart" pills has not been proven to be affective how is it possible to consider it as cheating?
- Students, children and parents must be made aware of the implication of using "smart" pills. Campaigns by authorities like the Ministry of Health could coincide in the same line as anti-drug education.
- TMS for cognitive enhancement as stated in this paper is still ongoing research. Therefore TMS availability to the public and effectiveness is questionable.

**Is neuroscience research exceptional? What particular safeguards should there be in the ethics governance of such research, in addition to what is already in place for other types of human biomedical research?**

66. The BAC noted that most of the issues raised by neuroscience research are not very different from other types of biomedical research, or could be addressed by existing principles and guidelines on the ethical conduct of human biomedical research. For instance, informed consent for persons lacking capacity to participate in research other than clinical trials is applicable generally. The question of the extent of a researcher's duty to return incidental findings is also relevant in genomic or genetic research, where there is also a high likelihood of such findings. Stem cell therapy is being explored for other disorders besides neurological ones, and the same question about the ethical acceptability of sham surgery exists. Similarly, concern about controls involving healthy participants arises for all high risk interventions.

67. Perhaps more unusual are the ethical issues relating to the use of neurotechnologies for non-medical purposes, particularly for cognitive enhancement; though the human

enhancement debate is hardly exceptional to neurotechnologies, having also been discussed in the context of genetic, stem cell and reproductive technologies. What distinguishes neurotechnologies from other types of technologies is that they may affect the *brain*, generally regarded as an exceptional human organ because it is the seat of one's mind, intelligence, consciousness, thoughts and emotions. The potential to elicit irreversible changes to personality and personal identity suggests that the use of neurotechnologies when not absolutely crucial, such as for non-therapeutic purposes of enhancement, should be subject to careful consideration and appropriate safeguards.

68. The use of neurotechnologies for "mind reading" may be an exceptional ethical issue arising from neuroscience research. With increasing sophistication of neuroimaging techniques, the human brain and mind are increasingly at risk of becoming more "transparent". Although current methods are unable to do so, neuroimaging studies could at some point reveal one's innermost thoughts and unconscious attitudes, and information obtained from such research could therefore be sensitive and may threaten one's sense of privacy. Moreover, if it is possible to "read" one's mind, the technique could be exploited for purposes such as screening of job applicants.

69. The concept of selfhood may also be challenged, when computers are integrated into thought processes. Protection of an individual's privacy is crucial, as BCIs may reveal psychological states, traits, and mental health vulnerabilities, and it may not be in the individual's best interest to have such personal information available to others. There are also concerns that "mind reading" may become possible through machines that can tap into the user's private brain processes. BCIs may also pose a threat to personal autonomy, as the brain can be conditioned or disrupted with implanted technologies. Will human dignity be compromised by the detection and interpretation of subconscious brain signals? What about thought implantation – is it ethically permissible? How do we ensure that cognitive liberty and freedom of thought are not compromised during research using BCIs?

**Response from AWARE**

To ensure protection of an individual privacy:

- Confidentiality agreement, the individual identity and researched findings must remain confidential and only be used for the purpose of the reached.
- The effects from the research programme, if any, should not put the individual participator at harm or lead the participator to inflict harm on others.