

## *Guest Editorial: Neuroethics—From Neurotechnology to Healthcare*

JUDY ILLES and ERIC RACINE

In proportion to other serious illnesses, diseases of the brain and mind represent the greatest—and still increasing—public health burden that Western societies are facing. Consequently, scientists, governments, advocacy groups, and public health authorities are committed to research to tackle the causes and consequences of neurological and psychiatric diseases and to find cures for them. As neuroscience research progresses, ethicists and neuroscientists face numerous ethical challenges to the integration of frontier application of research—neurotechnology—with the delivery of high-quality healthcare. In this special neuroethics issue, we have invited distinguished scholars with diverse disciplinary backgrounds to present their reflections and research on the ethical dimensions of this crucial integration.

### **Frontier Neurotechnology and Neuroethics**

The first four contributions explore topics in healthcare and research neuroethics by examining how frontier neurotechnology is setting challenges for the delivery of healthcare and the practice of neuroscience. Building on his most recent publications on the topic, Anjan Chatterjee provides a thought-provoking examination of the origins of cosmetic surgery and the forces that have led to its current success. He then challenges the reader to consider the parallels between cosmetic surgery and cosmetic neurology. The use of neuroenhancement to improve cognitive function and affect in healthy individuals could become accepted just as common plastic surgery procedures have today. He leaves us with disquieting and yet-to-be explored questions about the role of physicians and bioethicists in addressing the fundamental changes that the acceptance of cosmetic neurology would bring in an era of growing commercialism.

Kathinka Evers considers a specific form of enhancement: the use of beta-blockers to treat posttraumatic stress disorder. Furthering the debate on neuroenhancement beyond conventional views, she discusses four potential ethical objections against “therapeutic forgetting” and concludes that none outweigh the potential benefits of improving the care of patients. However, as Evers describes, the benefits are not without risk, and the wider use of such pharmacological agents will need to be monitored according to societal values.

In addition to neuropharmacology, neuroimaging is currently another area of research yielding a wide set of challenges. Jocelyn Downie and Jennifer Marshall provide a detailed analysis of special considerations for imaging in the

pediatric population. They first describe the risks involved in neuroimaging procedures that need to be taken into account when obtaining assent and consent in the pediatric population. They then discuss some of the important challenges of neuroimaging in matters of image interpretation, access and resources, stigma, and confidentiality.

Moving from beginning-of-life to end-of-life care, William Winslade explores the implications of frontier research and clinical care for patients suffering from traumatic brain injury and who are left in a vegetative or minimally conscious state. This timely paper examines the promises and limitations of current treatment, including different views on the participation of traumatic brain injury patients in research. On the unavoidable topic of withdrawal of treatment, Professor Winslade provides an insightful analysis of the complex interaction between the medical prognostic uncertainties of traumatic brain injury and the hopes of families for recovery.

### **Public Neuroethics and Policy Challenges**

The next three contributions explore the policy challenges created by the translation of neuroscience to the public domain. Robert Blank carefully weaves together an analysis of policy and current neuroscience research. He stresses that governments and political institutions have not kept pace with successes of neuroscience research. Our societies are facing the possible ideological maneuvering of research results from both ends of the political spectrum, rendering us poorly equipped to tackle policy challenges set by an increasingly neuroscience-based understanding of violent behavior, conflict, addiction, and male–female brain differences. He urges more attention to the policy aspects of neuroscience and reminds us that these include growing insights into health and disease as well as social behavior.

The editors of this volume, together with coauthor Adriaan Van der Loos, present original results from an analysis of Internet-based practices of direct-to-consumer advertising for neuroproducts. Our results show that current FDA regulation is insufficient to ensure informed consumer choice for neuroimaging services and natural neuroproducts given observed gaps in risks and product information. The results further highlight that current Internet marketing practices put existing oversight mechanisms for the promotion of prescription neuropharmaceuticals to the test. Our contribution ends with a discussion of the impact of consumer-oriented promotion of neuroproducts on respect for person and autonomy in psychiatry and neurology.

Françoise Baylis and Andrew Fenton examine the National Academy of Sciences (NAS) policy on embryonic human stem cell research. They discuss the assumptions of the NAS position statement and pinpoint how it is based on human dignity. Baylis and Fenton then critically examine common ethical arguments on stem cell grafting in the brain of nonhuman primates and find a number of common flaws. These include the scientific necessity of interspecies chimeras, the inadequacy of rodent animal models, and a confusion about the meaning of human dignity. They also find that the argument against human stem cell implantation in nonhuman primates, based on moral status defined in relation to exclusively humanlike characteristics, is not plausible given current research in ethology and behavioral ecology. They point to the need for policy

that is well informed by modern biology and that is critical of philosophical and scientific assumptions about the nature of species boundaries and the value of animal models.

### **Epistemology and Interpretative Neuroethics**

The two final contributions to this issue explore fundamental philosophical topics on the nature of neuroscience knowledge and the assumptions that buttress its introduction in healthcare. Jason Robert considers the impact of current genomics and neuroscience research on the biological psychiatry of schizophrenia and its overall effects on disease classification. He first recalls fundamental epistemological and ethical issues related to psychiatric diagnosis. Robert then argues that the integration of neuroscience into disease concept and classification must recognize the value of a finer biology-based analysis of phenotypes while avoiding an overemphasis on reductionist and essentialist biological accounts of psychiatric illnesses.

Hubert Doucet concludes this section by highlighting the distinctive contribution that neuroscience could make to renew our perspectives on the nature of healthcare ethics. Critical of both the overly optimistic and the overly pessimistic assessments of the impact of neuroscience and neurotechnology on healthcare and society, he adopts a position based on moderate interpretations of the impact of neuroscience, represented, for example, by Antonio Damasio's well-known thesis that emotions play a key role in moral decisionmaking. For Doucet, this reflects the positive contribution that neuroscience makes to healthcare ethics. He concludes with comments on the necessity of dialogue to address the broad issues raised by neuroscience.

We hope that the readers of this special issue of the *Cambridge Quarterly of Healthcare Ethics* will enjoy these original contributions on neuroethics and that the issue will stimulate much needed research and solutions to the challenges that the contributions set forth.

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