

What is being said in the media and academic literature about neurostimulation? A new report by IRCM ethics experts raises important questions and concerns about tDCS

Montréal, May 22, 2014 – Over the past several decades, neurostimulation techniques such as transcranial direct current stimulation (tDCS) have gradually gained favour in the public eye. In a new report, published yesterday in the prestigious scientific journal *Neuron*, IRCM ethics experts raise important questions about the rising tide of tDCS coverage in the media, while regulatory action is lacking and ethical issues need to be addressed.

TDCS is a non-invasive form of neurostimulation, in which constant, low current is delivered directly to areas of the brain using small electrodes. Originally developed to help patients with brain injuries such as strokes, tDCS is now also used to enhance language and mathematical ability, attention span, problem solving, memory, coordination, and even gaming skills. Recently, states the report, tDCS has caused excitement in the lay public and academia as a “portable, painless, inexpensive and safe” therapeutic and enhancement device.

“Despite these claims, the effects of tDCS are hard to predict,” explains Eric Racine, PhD, Director of the Neuroethics research unit at the IRCM who supervised the research project. “The safety and efficacy of tDCS have only been demonstrated in controlled laboratory settings and, without supervision, the use of tDCS for enhancement might cause serious adverse effects such as temporary respiratory paralysis.”

The report shows the amount of publicly-available information on tDCS has increased dramatically in recent years, both in academic literature and print media articles. IRCM researchers analyzed the available information and found a considerable mismatch in tone and focus between academic and print media articles.

While academic articles focused on therapeutic and investigative uses of tDCS, discussions in print media articles mainly concentrated on potential enhancement uses, as well as therapeutic applications. In addition, media discussions have been optimistic, with little information concerning ethical issues, therapeutic limitations, or side effects that could result from widespread use, whereas academic articles usually involved a more balanced discourse.

“We encountered strong and potentially misleading statements about the real-world effects and applications of tDCS in print media headlines,” says Veljko Dubljevic, PhD, postdoctoral fellow in the IRCM’s Neuroethics research unit and first author of the report. “In our entire sample of media articles, only 3.5 per cent advised caution or mentioned the possibility of adverse effects.”

Given the nature of tDCS and the lack of oversight governing its use, the report explains that academic and print media discourse could shape the public’s risk-benefit perceptions, impact the uptake of this technology, and, consequently, lead to negative implications for ethical and regulatory oversight.

“With the rapid evolution of tDCS in the public domain and in academia, we recommend three areas of action to tackle the social, ethical and policy implications,” adds Dr. Dubljevic. “First, to curtail misunderstandings about tDCS, professional societies, researchers and government agencies should work toward increasing neuroscientific literacy by providing objective neutral data to the media and the public. Second, tDCS devices, as well as their marketing and manufacturing standards, need to be monitored and regulated. Training and licensing procedures should also be considered. Finally, we believe that physicians and other clinicians should become actively engaged in the discussion about ethical, clinical and policy aspects of tDCS.”

“The current regulatory gap means that tDCS is readily available as a service, product, or even a homemade device, in many countries without any guidance being provided by policy makers,” concludes Dr. Racine. “A response to the policy and regulatory aspects of tDCS is urgently needed.”

About the study

This research project was funded by the Social Sciences and Humanities Research Council. Authors for this report also included Victoria Saigle, research assistant in the IRCM's Neuroethics research unit. For more information, please refer to the [article published online](#) by *Neuron*.

About Eric Racine

Eric Racine is Associate IRCM Research Professor and Director of the Neuroethics research unit. He obtained a PhD in applied human sciences (bioethics) from the Université de Montréal. Dr. Racine is Associate Research Professor in the Department of Medicine (accreditation in Social and Preventive Medicine and in Bioethics) at the Université de Montréal. He is also Adjunct Professor in the Department of Medicine (Division of Experimental Medicine) and the Department of Neurology and Neurosurgery at McGill University. Dr. Racine is an affiliate member of the Biomedical Ethics Unit at McGill University. He is a Research Scholar from the Fonds de recherche du Québec – Santé. Dr. Racine's research is designed to improve the ethical aspects of quality of care, research practices and public communications in the domain of clinical and basic neuroscience. For more information, visit www.ircm.qc.ca/racine.

About Veljko Dubljevic

Veljko Dubljevic is a postdoctoral fellow in the Neuroethics research unit at the IRCM. He obtained a PhD in political science and political theory at the University of Belgrade, and completed the qualification requirements for a PhD in philosophy and neuroethics at Universities of Tübingen and Stuttgart (dissertation defense scheduled in June). Dr. Dubljevic's primary research interests include the ethics of neuroscience and technology, and the neuroscience of ethics. His other interests include bioethics, political theory, moral theory, business ethics, and philosophy of law. He has over 30 publications in moral, legal and political philosophy and in neuroethics. He is also engaged in the activities of the International Neuroethics Society (INS) and serves as a member of the INS's Communications Committee.

About the IRCM

Founded in 1967, the Institut de recherches cliniques de Montréal (www.ircm.qc.ca) is currently comprised of 35 research units in various fields, namely immunity and viral infections, cardiovascular and metabolic diseases, cancer, neurobiology and development, systems biology and medicinal chemistry. It also houses four specialized research clinics, eight core facilities and three research platforms with state-of-the-art equipment. The IRCM employs 425 people and is an independent institution affiliated with the Université de Montréal. The IRCM Clinic is associated to the Centre hospitalier de l'Université de Montréal (CHUM). The IRCM also maintains a long-standing association with McGill University. The IRCM is funded by the Quebec ministry of Economy, Innovation and Export Trade (Ministère de l'Économie, de l'Innovation et des Exportations).

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