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Neuroethics for Neurology Residents: Concepts and Contingencies of a Pilot Neuroethics Curriculum

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Moses and Illes (2017) posit that ethics education should be provided in the training of all neuroscience professionals, and propose coursework in ethical theories, history of ethics in neuroscience, and major neuroethical issues. We agree with their call for neuroethics education and argue its importance as a core competency of neurologists. Given recent and proposed translation of neuroscientific and technological research into various areas of clinical practice, neurologists are ever more likely to encounter neuroethico-legal issues fostered by the use of such diagnostic and interventional tools—often prior to directive guidelines and policies being established and in place. Early and recurrent education and training in neuroethics will be vital to equip neurologists with the knowledge and skills needed to effectively address and resolve these issues. Moreover, given that professional societies value the views and opinions of their experienced members, a growing cadre of neuroethically literate and competent physicians will be important to leading both the field, and the engagement of neurology as a public good. In this light, we have developed, implemented, and herein describe a neuroethics curriculum for neurology residents. Our curriculum introduces neuroethics as a discipline and set of practices, grounds practices of neuroethics to historical, current, and planned developments in brain science, and emphasizes discursive, problem-based address of key issues, and questions that have arisen and are likely to arise at the intersection of brain science, neurology, and the social sphere.

The need for ethics training in clinical residencies was recognized long before neuroethics was described and defined. Core competencies required in and for neurology training are delineated by the Accreditation Council for Graduate Medical Education (ACGME) and include bioethics under medical knowledge (ACGME 2010). Resources for ethics training in neurology residency have been supported and developed by the American Academy of Neurology (AAN) (Bernat 2008; Williams 2012). To some extent, however, although exceptions exist, ethics training in neurology residency remains somewhat limited. The last published assessment of ethics education in neurology residency was 20 years ago (Wichman and Foa 1996). At that time, there were no formal ethics curricula in neurology residency programs in the United States. However, there has been a growing interest in ethics, and it has been shown that ethical competency can be successfully improved with a case-based curriculum that is built on AAN objectives (Schuh and Burdette 2004; Tolchin, Willey, and Prager 2015).

Our curriculum, as outlined in Table 1, builds on the case-based teaching model. We begin with a foundation that addresses the viability and utility of neuroethics as a subdiscipline of bioethics, provides an overview of ethical theories and systems, relates medical ethics to a philosophy of medicine, reviews major milestones and initiatives in neuroscience, and provides methods for ethical case analysis and resolution, before proceeding with a case-

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Table 1. Clinical neuroethics resident curriculum

Neuroethics: definition and applications in clinical neurology
Review of ethical systems and the beginning of bioethics
Philosophical foundations of medicine
Brief history of neuroscience and technology
Major neuroscience initiatives
Ethics consult method
Neuroethics method
Dementia
Genetic testing in Huntington's disease
Pain
Neuroenhancement
Deep brain stimulation and the self
Brain death
Science ethics and the responsible conduct of research
Neuroscience in national security and dual-use technology

Note. Adapted from McAdams and Giordano (2016).

based learning approach that focuses on major ethical issues in clinical neurology (McAdams and Giordano 2016). We believe that case-based learning, especially in ethics, is attractive because it is interactive, often dialectical, interesting, and applicable to the realities of clinical care. However, pro Moses and Illes's proposed curricular elements, we also maintain that it is important to provide foundational knowledge—of ethical systems and methods, as well as of what neuroethics is, and why it is useful—prior to engaging cases. We clarify the division between traditional bioethical issues encountered in neurology and the issues that could, and arguably should, be seen as peculiar to clinical neuroethics. Our perspective of neuroethics, as depicted in Figure 1, begins with the view that the intersection of bioethics and neuroscience gives rise to neuroethics, and that clinical neuroethics arises from those areas where ethical issues in neurology (and other fields of medicine, e.g., psychiatry, pain medicine, rehabilitation) intersect with ethics and neuroscience (McAdams and Giordano 2016).

Review of major neuroscience developments places current issues in historical context and provides content and contexts for casuistic analyses. This orientation can also afford insights to the extent that brain science actually is—and realistically could be anticipated to be—engaged in medicine (Giordano and Shook 2015). Reviewing philosophical systems serves three main purposes. First, neuroscience professionals should have some understanding of the philosophical basis of their field. Second, it provides various systems within which ethical decisions can be analyzed, and in so doing undergirds the review of clinical ethical methods that are presented and utilized later in the curriculum. In its dealing with the brain, and the uncertainties that arise and persist as a result of new directions, capabilities, and translational applications of brain science, neuroethics may have a unique focus, but its methods of

ethical address and analyses are not necessarily unique (Giordano and Shook 2015). Third, understanding basic philosophic principles can engender a level of metaphysical and cultural humility, which is essential if such ethical issues are to be approached within pluralist settings. The philosophy of medicine establishes what medicine is, and that the patient–physician relationship serves as the basis of ethical analysis. In extending this relationship to all potential patients, it can also establish neurology as a public good.

Although it may be difficult to present these concepts in a busy clinical setting in ways that appear relevant, we argue the importance of a foundation in ethics and neuroscience as essential to beginning to understand clinical neuroethics prior to analyzing cases, while recognizing the need to address that material succinctly, given time constraints. For the curriculum to succeed, acknowledgment and support from clinical leadership are critical. Clinical schedules are busy and are made more challenging by limitations on work hours; residents have competing duties and are primarily focused on learning the technical aspects of their practice. With expanding breadth and depth of clinical knowledge to cover, didactic time is scarce. Our curriculum is implemented through provision of 1-hour, monthly sessions over the course of a year. A future consideration is in creating a tiered program, tailored for each residency year-group, that covers various topics over the course of training.

We posit that neuroethics is important and necessary for neurologists because much of translational neuroscience is, and will be ever more, implemented in the clinic by clinicians. Thus, neurologists are likely to be faced with using technologies before ethical issues and questions fostered by their use (or nonuse) have been thoroughly analyzed or relevant policies are made. In this latter regard, neurologists are the policymakers within the profession. As documented by Moses and Illes, formal ethics education is not the norm among neuroscience professionals making ethics policy. Professional societies, such as the AAN, respect the education and experience of their members and, as such, appropriately look to the opinions of these members when drafting policy; a more ethically competent body of professionals will provide a richer community from which policy is produced. Finally, as has happened with economics in medicine, if physicians don't become involved in broader policy development, they risk executing and being subject to ethical policy that they did not have a voice in producing.

Science, medicine, and ethics are intimately and inextricably related. Increasingly, neuroscience is being explicitly oriented toward and translated into diagnostic and interventional approaches in the clinical setting. In addition to basic ethics education in medical school, neurologists (and other neuroscience-related clinicians, as already described), would be well served by in-depth ethics education during professional training. Ethical expertise will be needed at the bedside, as well as at the bench, and the decisions that guide the

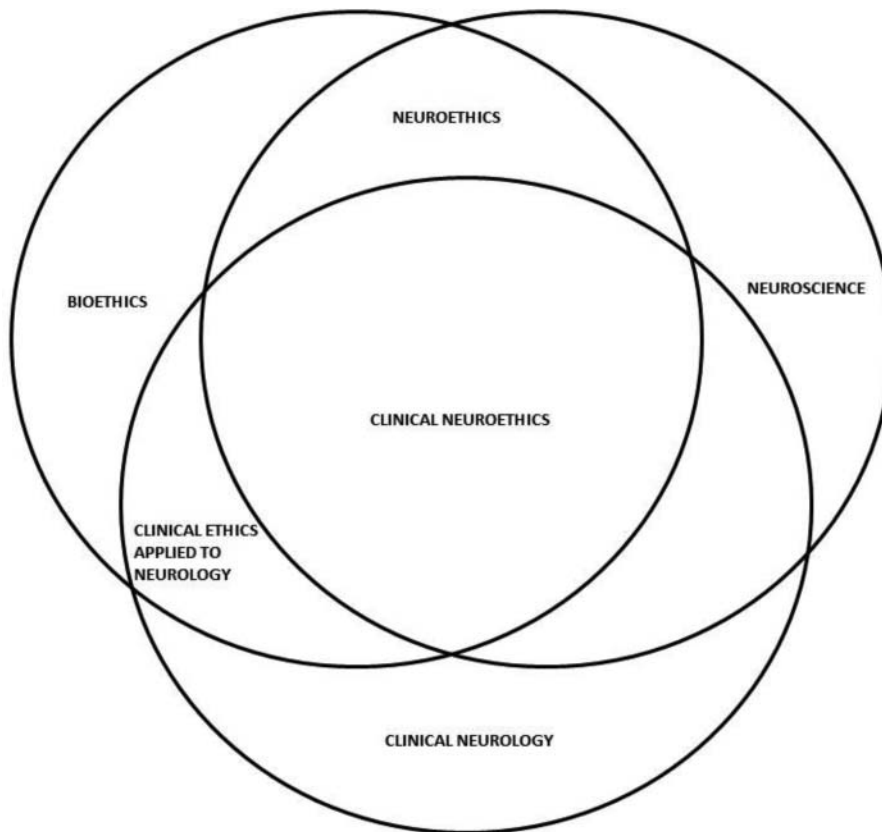


Figure 1. The relationships between bioethics, neuroscience, and clinical neurology. The intersection of bioethics and neuroscience gives rise to neuroethics. Traditional bioethics intersects with clinical neurology in many ethical issues seen in practice, such as incidental findings on neuroimaging and predictive biomarkers in neurodegenerative disease. The intersection of clinical neurology with neuroethics includes issues like neuroenhancement and brain death; as translational neuroscience advances, these issues will become more prominent in clinical practice. from McAdams and Giordano (2016).

translational use of emerging techniques and tools of brain science must be scientifically and ethically well informed, and supported and governed by equally well-informed policy and law.

To be sure, we too argue for neuroethics education, but do so in its literal meaning of *ex ducere*—“to lead forth.”¹ Neuroethics can provide a philosophic and scientific toolkit with which to analyze and more clearly define key developments and issues in neuroscience and neurology, and in practice may utilize this knowledge and insight to resolve particular questions and problems that the clinical uses of brain science may incur. Neuroethics and neuroethics education can and should lead those who engage and employ brain science away from misconceptions, misinterpretation, and misuse, and in these ways best serve patients, medicine, and society. ■

1. Latin, *ex ducere*: to lead forth. Developed to *educare*: to bring forth and into knowledge and/or skill; to train.

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What Can We Do for You? The Role of Ethics Experts in Neuroscience

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As one conclusion of their study, Moses and Illes (2017) suggest that members of ethics committees of neuroscientific organizations should receive appropriate training, turning them into ethics experts with a focus on neuroscience. While this conclusion is certainly justified, given the complexity of neuroscience themselves and the ethical issues raised by them, it also invokes the conceptually problematic notions of “ethics experts” and, implicitly, “ethical expertise.” This position seems to be debatable because, without further elaboration, it suggests that it is more or less clear how ethical expertise is constituted and that it could be accessed and acquired like any other expertise in any other domain. However, as we show here, there is a wide variety of abilities that contribute to ethical expertise and that are remarkably diverse.

WHAT IS ETHICAL EXPERTISE?—TYPOLOGICAL REMARKS

Following Weinstein (1994), one can distinguish between epistemic and performative ethical expertise: Epistemic ethical expertise consists in the ability to provide strong justifications for claims in the domain of ethics, whereas performative ethical expertise consists in leading a good life. However, although we stick to Weinstein’s terminology because it clearly describes two different types of expertise—knowing and doing—we use it in a different way. For, it seems to confuse ethical with moral expertise by presupposing that there are objectively valid criteria for leading a good life and that one can factually decide whether a person lives a good life or not. Yet these convictions rely on specific and controversial metaethical premises (Birnbacher 2012, 240), so that one should be skeptical as to whether moral expertise in this sense exists at all.

Epistemic ethical expertise, as we understand it, consists in knowledge about ethical theories, values and their

relations to each other, and ethically relevant concepts that are different from values. Ethical theories include the classical candidates like utilitarianism and deontological ethics, but also their varieties, such as act- and rule-utilitarianism. With “values,” we refer to (not necessarily material) things that are good for people to have or that are good to be instantiated, such as autonomy, liberty, pleasure, and freedom from pain. An ethical expert knows not only which values exist, but also possible relations between them, for example, promoting or conflicting with each other. Finally, epistemic ethical expertise involves knowledge about concepts that are not ethical themselves but play a role in ethical debates. Examples are the concept of personal identity, the doctrine of double effect, and the principle that “ought” implies “can.” These and further examples are often referred to in ethical debates, which is why one can only fruitfully engage in them if one has at least basic knowledge about these concepts.

We understand performative ethical expertise as highly advanced skills in ethical reasoning. A person who has epistemic ethical expertise is not necessarily able to use her knowledge, so that both kinds of expertise are needed in order to be a full-fledged ethics expert. Expertise in ethical reasoning can be demonstrated by being able to formulate ethical arguments that are internally coherent and externally plausible. It therefore also involves abilities in logical thinking. Furthermore, a central component of expertise in ethical reasoning is the ability to formulate well-justified evaluative or prescriptive positions. This requires mediating between conflicting values or principles and providing convincing reasons why, for example, adherence to one principle is ethically acceptable even if it implies the violation of another principle. These expressions of performative ethical expertise can become relevant in singular or local cases, where an ethically justified verdict on a specific case needs to be returned. Yet they also play a role in more general or global tasks, such as the creation of an ethical code of conduct for an entire organization.

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These general remarks on ethical expertise are applicable to the case of ethical expertise in neuroscience by fleshing out the values and ethically relevant concepts that are of particular relevance in this specific field. An ethics expert in neuroscience needs to have profound knowledge on personal autonomy, authenticity, and personal identity. Neurological interventions, such as deep brain stimulation or predictive brain implants, have the potential to radically alter a patient's image of herself as an autonomous being, for better or worse (see Gilbert 2015; Kraemer 2013). Only a person who understands these concepts and their implications and is also able to operate with them in an ethical discourse would count as an ethics expert in neuroscience. Yet concepts like beneficence and nonmaleficence are also central to neuroscience because one can imagine situations where an intervention would benefit a patient at the expense of her autonomy or her perception of herself as an authentic person. Performative ethical expertise would then include the ability to provide convincing justifications for decisions in such cases of conflicting values.

TWO POSSIBLE STRATEGIES FOR NEUROSCIENCE ORGANIZATIONS

Our remarks show that knowledge on very different subjects is one component of ethical expertise in neuroscience, but so is the ability to use this knowledge in ethical discourse. In order to achieve this kind of ethical expertise, a person needs both time for theoretical studies and opportunities for training her performative ethical skills. We next sketch two possible strategies neuroscientific organizations can pursue if they wish to ensure that members of their ethics committees are genuine ethics experts.

Strategy 1: Continuous Training

The first strategy roughly resembles the proposal of Moses and Illes regarding mandatory training for members of ethics committees. However, we remain skeptical that the content and intensity of a training as recommended by Moses and Illes sufficiently represent the diversity of knowledge and abilities genuine ethical expertise in neuroscience consists of.

We recommend that members of ethics committee continuously participate in ethics trainings on a regular basis during their tenure. This can be done by passively attending appropriate conferences or workshops given by experts in neuroethics, but also by actively participating in neuroethical research, preferably together with researchers who have a background in philosophical or medical ethics. The latter measure ensures not only that members of ethics committees keep track of developments in neuroethical research, that is, fulfill the requirements of epistemic ethical expertise, but also that they acquire and maintain performative ethical expertise as well.

A side effect of continuous training is that members of ethics committees get not only *formal* but also *factual* legitimacy. They would have formal legitimacy, for example, if they had some certificate about their participation in mandatory ethics courses. However, this formal legitimacy should not be equated with factual legitimacy one can only have by demonstrating one's expertise in ethical discourse and one's commitment to maintaining this expertise over an extended period of time.

Strategy 2: Ethicists in Ethics Committees

The second strategy takes into account that acquiring expertise in a further discipline beside one's main occupation requires a large amount of time devoted to studying this discipline. Pursuing this strategy means that neuroscientific organizations accept that a significant proportion of members of their ethics committees do not have a background in neuroscience but in philosophical or medical ethics. Consequently, these members would not have expertise in neuroscience but only some basic knowledge, just as regular neuroscientists without any advanced ethics training would hardly have more than basic knowledge in ethics.

The main advantage of this strategy is obvious: By ensuring this kind of interdisciplinarity in ethics committees, their decisions and policy recommendations would be both neuroscientifically informed and ethically justified. This would be valuable for a consistent management of the organization's internal affairs, but it would also contribute to its external credibility.

A requirement of this strategy is open-mindedness by both groups of experts within the same ethics committees and basic knowledge about current topics and discourses in ethics and neuroscience, respectively. This requirement can be fulfilled, for example, by selecting members with a proven track record in interdisciplinary and collaborative research that does not necessarily have to contain evidence of genuine ethical or neuroscientific expertise in the sense described in the preceding paragraphs.

CONCLUSION

Ethical expertise in neuroscientific issues is difficult to acquire because it requires knowledge in highly diverse ethical and even nonethical areas, as well as performative skills in ethical reasoning. There are two strategies neuroscientific organizations can pursue if they wish to ensure that genuine ethical expertise is represented in their ethics committees. One strategy relies on continuous instead of singular training of their members, while the other strategy focuses on interdisciplinarity and the inclusion of ethicists by training in such committees.

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Improving Ethics Standardization Through Examination

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In preparing ethicists with specialized expertise in neurological sciences, institutions should recognize the importance of implementing an examination element when drafting pedagogy. Establishing a means of certification through examination is the appropriate step in realizing Moses and Illes's (2017) vision of improved standardization and transparency in committee recruitment and training. Such an exam would help institutions to (1) objectively evaluate the preparation of committees and individual consultants, (2) assess the efficacy of institutional ethics training, and (3) establish a baseline of what expertise in neuroethics should include.

In the last few decades, several institutions have made efforts to develop postgraduate fellowships, certificates, and degree programs in medical ethics (Chidwick et al. 2004; Hill 1994). On one hand, this has led to an array of academically rich and engaging opportunities to develop expertise in ethics. On the other hand, the number of programs churning out graduates calls into question whether or not there should be an accrediting body for such programs. Relatedly, there is growing sentiment for institutions to collectively develop a baseline standardization for ethics curricula (Acres et al. 2012). Professional organizations focusing on neurological sciences can assume a leadership role in establishing such a curriculum by collectively developing a comprehensive credentialing exam in neuroethics.

A standardized assessment of content acquisition in bioethics is challenging but not impossible. Though the practice of ethics is, in many ways, contextual, there is potential for measuring general mastery in the field. Program directors and faculty at Emory University acknowledged this in developing a comprehensive exam for their master's of bioethics program. In particular, they cited two benefits worth noting in implementing a comprehensive exam: (1) the ability for students to demonstrate general mastery in bioethics rather than narrow depth through thesis work, and (2) the ability for faculty members to assess

the efficacy of their curriculum through a common metric of exam scores (Schonfeld, Stoddard, and Labrecque 2014).

Another example of "standardization with examination" is demonstrated by the Collaborative Institutional Training Initiative—or CITI Training—for research ethics. Launched in 2000, the CITI program has been used by more than 600,000 people at more than 715 institutions (Braunschweiger and Goodman 2007). CITI Training is now a requirement at most institutions for those conducting human subjects research, providing participants with a baseline understanding of research ethics and human subjects protection. The content is not meant to be exhaustive, but there remains an exam after each short educational module, allowing participants to evaluate mastery before moving onward in their training.

Combining the merits of both aforementioned examples can help to achieve the level of standardization and transparency that Moses and Illes envision. A collective of representatives from academic institutions and organizations that focus on neurological sciences can work to develop an exam that serves as a means for credentialing potential ethicists. Unlike CITI Training, this exam would take place at the end of any formal training in ethics (i.e., a graduate or certificate program, a postgraduate fellowship). This serves two benefits. First, it allows for professionals in neurological sciences to reach consensus on a baseline of what expertise in neuroethics should include. It also implies that an examination alone is not enough in credentialing clinical ethicists, but is rather a standardized piece that can be added to existing portfolio-based models (Fins et al. 2016). This acknowledges the role of formal training in developing consult skills and broader ethics expertise while simultaneously providing a standardized assessment specifically tailored to neurological sciences.

Not only does such an exam improve standardization for credentialing, it can also be used for transparency purposes as an institutional assessment tool for preparation and quality. Currently, ethics committees lack a means to

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