

# *Health Information Technology as a Universal Donor to Bioethics Education*

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**Abstract:** Health information technology, sometimes called biomedical informatics, is the use of computers and networks in the health professions. This technology has become widespread, from electronic health records to decision support tools to patient access through personal health records. These computational and information-based tools have engendered their own ethics literature and now present an opportunity to shape the standard medical and nursing ethics curricula. It is suggested that each of four core components in the professional education of clinicians—privacy, end-of-life care, access to healthcare and valid consent, and clinician–patient communication—offers an opportunity to leverage health information technology for curricular improvement. Using informatics in ethics education freshens ethics pedagogy and increases its utility, and does so without additional demands on overburdened curricula.

**Keywords:** bioethics curricula; biomedical informatics; health information technology; medical education

## Introduction

The question of when and whether an area of work, inquiry, or interest becomes a discipline, a field, or even a profession is an interesting one. The disciplines, fields, or professions of bioethics and biomedical informatics are particularly good examples. Informaticians, sometimes so-called, are a challenge because some are computer scientists, some are physicians, some are nurses, and some work in yet other professions. In bioethics, those who practice it are also professionally diverse.<sup>1</sup> What is of interest for our purpose here is that both bioethics and biomedical informatics seem to have been fledged as fields or disciplines some three decades ago, in the 1980s, and both have since been incorporated to a greater or lesser degree in the training of health professionals.

The goal here is to consider and then advocate an explicit link between these two disciplines. In one familiar direction, the suggestion is simply that informatics courses include an ethics thread or component. This is of a piece with efforts to include ethics in several of the

biomedical specialties, hence ethics in genetics, pediatrics, psychiatry, surgery, and other specialties. It is in the other direction that an opportunity for pedagogic innovation will be identified. The idea is that the expanded use of information technology in healthcare offers a novel way to introduce and address issues in bioethics. From end-of-life care and privacy to clinician–patient communication and valid consent, the ubiquity of computers in medicine and nursing can itself be used to shape and inform the bioethics curriculum.

Using informatics to help teach ethics has several virtues, among them that it might refresh a curriculum gone stale, could make real what students had perhaps come to regard as abstract, and, likely, offer a contemporary demonstration of the role that new technology plays as a source of many ethical issues in the health professions.

## Bioethics in the Medical Curriculum

Although all contemporary medical schools have an ethics component of

one form or another, the content and commitment are variable. An American Society for Bioethics and the Humanities task force found that "... the range of hours dedicated to bioethics and humanities currently ranges from 4–200 hours."<sup>2</sup> This is disappointing. It is also surprising, given that the Liaison Committee on Medical Education (LCME), which accredits medical schools in North America, requires ethics education to achieve accreditation. One LCME standard specifies that "The faculty of a medical school ensure that the medical curriculum includes instruction in the scientific method (including hands-on or simulated exercises in which medical students collect or use data to test and/or verify hypotheses or address questions about biomedical phenomena) and in the basic scientific and ethical principles of clinical and translational research (including the ways in which such research is conducted, evaluated, explained to patients, and applied to patient care)."<sup>3</sup>

And another stipulates, "The faculty of a medical school ensure that the medical curriculum includes instruction for medical students in medical ethics and human values both prior to and during their participation in patient care activities and requires its medical students to behave ethically in caring for patients and in relating to patients' families and others involved in patient care."<sup>4</sup>

In the United Kingdom, ethics is regarded as "a core content of learning" in medical schools and, hence, a "shared obligation" of educators.<sup>5</sup>

The idea that the formal education of medical students should include attention to ethics was initially framed 30 years ago. In a landmark *New England Journal of Medicine* article, Charles M. Culver and eight others among the parents of contemporary bioethics argued that "the field is now sufficiently

developed and the need for the application of ethical knowledge and skills in medicine sufficiently compelling to justify a recommendation that all medical schools require basic instruction in the subject."<sup>6</sup>

The early-to-mid-1980s were a kind of golden age in medical ethics. From neonatology to geriatrics, clinicians in North America and Europe had come to realize that no amount of scientific training was adequate to address the ethical challenges raised by the day's technologies. Ethics committees were established and ethics consulting services fledged. In 1983 in Miami, for example, Drs. Donald Buckner, a pediatric surgeon, and Thomasine Kushner, a philosopher, began ethics rounds in the neonatal critical care unit at Jackson Memorial Hospital, a teaching and research partner of the University of Miami Miller School of Medicine. It is thought to be one of the first regular efforts to integrate bioethics into hospital practice. There was not a computer to be seen.

Over more than a quarter century, medical school curricula began to include sessions on privacy, end-of-life care, access to care and the duty to treat, valid consent, and clinician–patient communication. These topics and issues persist in the curriculum in one form or another and lend themselves to a partnership with instruction in a comparatively new but ubiquitous technology.

### **Using Information Technology to Invigorate the Bioethics Curriculum**

These topics and issues are broad and varied, and it is not being suggested that all their components and nuances are isomorphic with issues in information technology. A comprehensive bioethics curriculum will include subjects with no credible connection to information technology. The goal here is more

modest; namely, to commend the use and challenges of this technology to introduce and augment certain key components of the traditional curriculum.

### *Privacy*

Perhaps the most ancient of values in the health professions, privacy and confidentiality are often assigned preeminence among the issues and challenges raised by biomedical informatics. Although this might be a mistake in emphasis,<sup>7</sup> it makes tolerably good intuitive sense that the digital or electronic storage and transmission of patient information would cause concerns related to privacy protection. The interesting question is not whether electronic health records, for example, raise privacy issues—any collection of personal health information does that—but, rather, whether digital health records pose any new challenges.

Medicine has traditionally addressed privacy in the curriculum (1) historically and as a matter of professional duty; that is, Hippocrates' "sacred secrets," (2) philosophically, by emphasizing entitlements to control information about oneself, including patients' rights to access their own information, and (3) practically, including reminders not to discuss cases in elevators or with friends and family.

Although these are still valuable lessons, the health professions now must and, therefore, ought to (1) address prohibitions against accessing the electronic health records of people one is not caring for, and those against sharing passwords; (2) review obligations related to handling records available remotely, as on mobile phones or laptop computers; and (3) address institutional issues including sharing patient information for research, quality control, and collaborations with industry.

### *End-of-Life Care*

Death and dying remain the largest sources of hospital ethics consultations, and the evolution of several life-prolonging technologies continues to vex clinicians. The core curriculum for medical students has tended to emphasize the right to refuse treatment, if not a right to die, assistance in dying, do-not-resuscitate orders, and clinical futility. Managing patient or family requests for treatments thought to be ineffective evolves quickly into the problem of futility.

Progress in the development of prognostic scoring systems or programs that predict the likelihood of a patient surviving a particular hospitalization (especially in critical care units), has produced tools for rendering highly accurate prognoses. If a computer system lacking bias and memory lapses, and having access to tens of thousands of reference or comparable cases, calculates that a specific patient will die, then under what circumstances, if any, should this calculation be used to guide end-of-life care?

Somewhat snarkily called "computational futility metrics,"<sup>8</sup> these scores could be used to guide or defend decisions to withhold or withdraw treatment. At the least, they are no less reliable or accurate than customary responses to the unhappy question, "What are my chances, Doc?" Contrarily, the use of such programs could be argued to retard medical advances achieved when physicians push the limit and continue aggressive treatment in the face of doubt and skepticism. Moreover, there are few if any precedents for delegating medical decisionmaking to machines, however intelligent. The use of prognostic scoring systems provides a novel introduction to the challenge of medical futility, and is worthy of debate in itself.

*Access to Care*

There are, it is rumored, conservative and libertarian physicians and nurses who believe that their professions have obligations to humanity, even if the state does not. Put differently, even in countries with inadequate or dysfunctional healthcare systems, there is widespread if not universal agreement that, once trained in the practice of medicine or nursing, one has an obligation to use the skills and knowledge acquired to reduce human suffering and disease. This is true even in the absence of opportunities to acquire personal wealth from a free market in the process.

The tools of information technology are often and legitimately thought to provide opportunities to expand the reach of human physicians without regard to their politics. From improved record-keeping to public health to the ability to communicate with, if not treat, patients remotely, there are good reasons to be enthusiastic about research to determine effectiveness and improvement. If it is true that if one has tools that can improve the care of individuals and the health of populations, then one, or one's civilization, should use those tools.

This is in part an empirical question: Can "remote presence healthcare" deliver on its promise, or will we learn that what some communities need is a doctor or nurse, not a better Internet connection?

Introducing discussions about telemedicine, mobile health in rural and low-income communities around the world, and broader use of online patient education can serve as sources of discussion and debate about a collective obligation to serve, treat, and care. One interesting issue just hinted at is whether digital health is a bona fide tool for improving care to underserved populations or a ruse to appear to be

reaching out when we actually might be pushing back.

*Valid Consent and Communication*

The need to obtain, and the complexities of, informed or valid consent make this perhaps the most important and widely applicable value and duty in the education of clinicians. Such consent is widely agreed to have three parts: adequate information, appropriately communicated; the capacity to understand and appreciate that information (generally speaking); and voluntariness, or the making of a free, unpressured, and uncoerced choice.

The Spanish physician Gregorio Marañón (1887–1960) is reputed to have believed that the most important invention in the history of medicine was the chair. If sitting and listening are as important to the physician–patient relationship as commonly supposed, and if the consent process is as central to the ethics of clinical practice as is universally agreed, then it is worth inquiring what effects information technology will have on communication.

In the same way email has changed most other social, professional, and personal interactions, it has begun to alter the practice of medicine and of nursing. Can email improve the valid consent process? To what extent should a physician or nurse go to embrace or disdain such communication before a reliable basis in evidence is available to guide practice? The use of personal health records or "portals" to the actual electronic health record is now encouraged in the belief that it improves provider–patient communication and, by extension, the consent process. It could be argued that patients should have the ability to read (but not alter) their complete health record as a tool for the improvement of consent, but this, then, offers an opportunity to introduce the

challenges raised in documenting clinical encounters, perhaps especially the problem of copying and pasting earlier notes, making them appear as current. This practice confuses experienced clinicians; however, its effect on the consent process is not known.

A virtue of using health information technology as a fulcrum in the bioethics curriculum is both that these new tools—email, personal health records, and mobile health—provide connections to the valid consent process, and that they are of nontrivial ethical interest in their own right. It is distinctive that a single aspect of clinical practice is applicable to, and therefore useful, over such a broad terrain.

### **The Role of Health Information Technology in the Ethics Education of Clinicians**

From problem-based learning to flipped classrooms to training with multidisciplinary teams, medical education is undergoing extraordinary change, as ever:

“We have outrun an educational system framed in simpler days and for simpler conditions. The pressure comes hard enough upon the teacher but far harder upon the taught, who suffer in a hundred different ways.” That was Sir William Osler, in 1913.<sup>9</sup> In many respects, the past will always be simpler. There was a day when, à la Osler, it was apparently sufficient to teach students to be virtuous and not necessarily how to address and resolve challenges in the ethics of clinical practice.

The medical and nursing curricula are limited as to what they can include (adding time for ethics in the curriculum is, anecdotally at least, a difficulty at most medical and nursing schools). Anything that can be done to demonstrate connections between and among curricular components emerges as a wise

use of time. Compare in this regard the opportunity to link instruction in pharmacology and analgesics’ mechanisms of action to palliative care and to end-of-life care.

The suggestion that educators take advantage of a new technology to introduce an ancient topic is to seek a kind of “two-fer” in medical and nursing pedagogy. Because the connections are organic and not forced, this is a potentially valuable opportunity. It should, for that matter, not be limited to schools of medicine and nursing but explored also in public health, philosophy, religious studies, and other fields. Anywhere that bioethics is taught provides an opportunity to link the challenges posed by the new tools of information technology. Although some pedagogic approaches and techniques are fashionable and will one day be supplanted, information technology is not going anywhere.

Moreover, and to the extent that ethics in medical and nursing education has become stale or routine, this technology could be a path to its invigoration. Unlike other technologies that have shaped bioethics, the use of intelligent machines is not a tool to help clinicians see, hear, cut, or touch better, but, rather, one to help them think and perhaps communicate better.

### **Conclusion**

The extraordinary growth of information technology in clinical practice represents an opportunity to change the bioethics curriculum. By using electronic health records in addition to elevator conversations as introductions to privacy, leveraging prognostic scoring systems to address death and futility, reviewing mobile health to study access to care, and borrowing from personal health records to gain a clearer understanding of the consent process, medical

educators have a chance to innovate a curriculum and make contemporary what in many cases are ancient values.

Health information technology becomes a universal donor to bioethics curricula because its breadth matches that of bioethics, and educators can explore and evaluate their innovation without placing an additional burden on jam-packed curricular slots.

The history of bioethics is, commonly, a history of how the health professions have responded to new technologies. In health information and its many tools and tackle, there is a technology that itself can guide the health professions' best efforts to ensure that the knowledge and critical thinking skills of bioethics are realized simultaneously in assessing the appropriate uses of the technology.

## Notes

1. The late philosopher Bernard Gert, who made a number of very important contributions to bioethics, was known to have harbored disdain for the term "bioethicist." Among other things, he said, he could not pronounce it.
2. American Society for Bioethics and Humanities. ASBH Task Force on Ethics and Humanities Education in Undergraduate Medical Programs. Glenview, IL, 2009; available at <http://asbh.org/uploads/publications/Report%20on%20Ethics%20%20Humanities%20in%20Undergraduate%20Medical%20Programs.pdf> (last accessed 5 Oct 2016).
3. Liaison Committee on Medical Education. Functions and Structure of a Medical School: Standards for Accreditation of Medical Education Programs Leading to the MD Degree. Washington, D.C., and Chicago, IL, 2016; available at [http://lcme.org/wp-content/uploads/filebase/standards/2017-18\\_Functions-and-Structure\\_2016-09-20.docx](http://lcme.org/wp-content/uploads/filebase/standards/2017-18_Functions-and-Structure_2016-09-20.docx) (last accessed 5 Oct 2016).
4. See note 3, Liaison Committee on Medical Education 2016.
5. Stirrat GM. Teaching and learning medical ethics and law in UK medical schools. *Clinical Ethics* 2010;5(3):156–8.
6. Culver CM, Clouser KD, Gert B, Brody H, Fletcher J, Jonsen A, et al. Basic curricular goals in medical ethics. *New England Journal of Medicine* 1985;312(4):253–6.
7. It has been argued that computerized decision-support systems, which render diagnoses, differential diagnoses, and treatment plans are at least as interesting and introduce problems potentially more challenging to solve: Goodman KW. *Ethics, Medicine, and Information Technology: Intelligent Machines and the Transformation of Health Care*. Cambridge: Cambridge University Press; 2016.
8. See note 7, Goodman 2016.
9. Osler W. Examinations, examiners, and examinees. *Quarterly of the Federation of State Medical Boards of the United States* 1914; 1(2):101–14. An editor's note reads, in part, "An address delivered at the opening of the winter session of St. George's Hospital Medical School on October 1st, by the Regius Professor of Medicine in the University of Oxford and reported in *The Lancet*, October 11, 1913." Cited by Harden RM. Trends and the future of postgraduate medical education. *Emergency Medicine Journal* 2006; 23(10):798–802. Osler's remarks conclude: "A paragraph in an address of the late Dr. Stokes contains the pith of my remarks: 'Let us emancipate the student, and give him time and opportunity for the cultivation of his mind, so that in his pupilage he shall not be a puppet in the hands of others, but rather a self-relying and reflecting being.'" This may be seen as a celebration of improving critical-thinking skills of the sort required by contemporary bioethics, even though, it develops, that Osler produced "remarkably little on the subject of medical ethics." Sokol DK. William Osler and the jubjub of ethics; or how to teach medical ethics in the 21st century. *Journal of the Royal Society of Medicine* 2007;100(12):544–6.