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Disease Concepts and Molecular Medicine: The Ethical Significance of Conceptually Examining New Biomedical Technologies

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Abstract

When anticipating ethical issues associated with biomedical technologies, this article argues that it is helpful to begin with an examination of implied disease concepts. Additionally, it demonstrates that this can be accomplished at an early stage. When a technology is still in its infancy molecular medicine is the specific case that is being examined here. A "cascade model" of disease processes and a personal pattern" model of bodily function are combined in this group of new technologies. While the first's ethical implications are somewhat reminiscent of earlier, albeit contentious, preventive and predictive medicine methods, the seconds are quite novel and could have far-reaching implications.

Keywords: Concept of disease; Ethics; Emerging technology; Epistemology; Molecular medicine; personalized medicine; Health technology assessment

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Introduction

In the history and philosophy of medicine, as well as the philosophy of technology, it is frequently observed that brand-new biomedical technologies frequently result in new definitions or even concepts of disease. Medical history demonstrates that new diagnostic and therapeutic technologies frequently reorganize our conceptions of particular diseases [1]. Medical philosophers have argued that technology is the idea of disease. For instance, Hofmann argues that technology influences explanatory models, defines how we respond to disease, provides the entities used in its definition, and constitutes its signs, markers, and end points. This is consistent with findings from philosophy of technology in general, which assert that brand-new technologies frequently result in the creation of brand-new ontologies, roles, and responsibilities [2]. The technological nature of disease has sparked a lot of philosophical debate, such as whether disease definitions are descriptive or normative, whether they are ontological or conventionalist, and how disease and illness relate to one another. A recent thematic issue of this journal is evidence of the on-going debate in this field. It has been argued that this kind of conceptual analysis of the use of the terms "disease" and "health" has very little to do with ethical analysis [3]. Even though health is generally regarded as a major component of a good life, Scrammed suggests that conceptual analysis of "health" is curiously absent from biomedical ethics. In addition, the absence of this kind of analysis in biomedical technology ethics is even more remarkable. Ethical analyses of novel biomedical technologies rarely include analyses of the concept of disease and/or health implied by these new technologies, despite the steady increase in research in the area of ethical, legal, and social aspects of new technologies and the growing attention to ethics in Technology Assessment. Analysis of implied concepts of disease and/or health, as Hofmann and Stempsey have demonstrated, may be very relevant to ethical debates regarding new and emerging technologies. Stempsey argues that new ideas about health are being created as a result of new biomedical technologies that constantly alter our perceptions of health and disease. He believes that such innovations will unavoidably present us with ethical difficulties [4].

Technology and medical objectives

This is unquestionably true for discussions regarding biomedical technology. Most of the time, new biomedical technologies are presented as reducing disease and mortality and/or promoting health—values that are widely accepted and difficult to dispute. In addition, it is frequently asserted that cutting-edge biomedical technologies are more efficient at achieving these objectives, that they cause fewer adverse effects, or that they are less taxing on the

patient. As a result, new technology is presented as a novel or even "revolutionary" tool for achieving conventional, broadly agreed-upon objectives [5]. This method of argument, as suggested by Swierstra and Rip, is particularly useful for preventing moral debate regarding new technologies. After all, a new technology can at least initially claim moral legitimacy if its goals are well-known and uncontroversial. The subsequent inquiry is: Are the objectives actually recognizable and uncontested? Technological philosophers advise caution here. There is more to technological means than just neutral instruments; They act independently. New technologies actually shift or reinterpret the goals, often in ways that are not immediately apparent, while attempting to realize familiar objectives through various means [6]. Both our perceptions of the world and our actions within it are mediated by technology. When we realize that technology is more than just a physical device, this becomes clearer: It is a socio-technical complex with material and human components that depend on each other. It takes a lot of work to make a material device work; It assumes a specific use context. In addition, it rethinks the relevant actors, their roles, and even the other physical objects that are a part of the technological practice by doing so. As a result, we might find ourselves in a world very different from the one that existed prior to the introduction of the new technology. Let me use a Williams's example from the field of biomedical technology to illustrate this [7]. A spirometer, which is used to measure lung function, is a big device that needs a helper to make sure the patient blows correctly and understands the results. In the event of a sudden deterioration, when immediate testing is required, patients must visit the laboratory to undergo testing, which is particularly challenging. Additionally, the spirometer's characteristics make it unsuitable for large-scale epidemiological studies. Peak flow meter devices, which can be used by patients and general practitioners to measure lung function, were developed as a result of these considerations. As a result, one might conclude that these peak flow meters are simply better instruments that accomplish the same thing [8].

Medical genetics: promises and possibilities

A test case will be the emerging field of molecular medicine. Molecular medicine is a relatively new area of science and, to a lesser extent, business that is thriving internationally. The majority of research institutes, master's programs, funding opportunities, and commercial start-ups were only recently initiated, whereas a journal and some research institutes were already established in the 1990s. The field's objectives are as ambitious as its subject matter. To use some definitions provided by the field itself, the goal of molecular medicine is to identify and alter the molecular mechanisms that underlie health and disease [9]. The fundamental understanding of human biological function is at the heart of everything it does. Only through the convergence of biomedical science, nanotechnology, and information and communication technologies have these kinds of knowledge and the means to alter these processes become accessible. Information and Communication Technology (ICT) helps to collect, analyze, and identify relevant patterns in the information generated by Nano technological instruments, whereas nanotechnology makes biological processes visible and enables their manipulation at the molecular level. As a result, the conditions for acquiring fundamental biomedical knowledge and using it in diagnosis and treatment are created by ICT and nanotechnology [10].

Conclusion

Despite the fact that molecular medicine is still in its infancy, we are already able to foresee some of the ethical implications of its visions of disease. Both molecular medicine's "personalized pattern model" of bodily processes and the "cascade model" of disease raise distinct ethical concerns. Particularly, the cascade model is built on concepts of disease that have been around since preventive and predictive medicine started. Consequently, some of the ethical concerns associated with predictive and preventive medicine return to molecular medicine. On the other hand, the personalized pattern model differs significantly from other models of disease and raises relatively new questions and issues.

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