Ethics & Biomedical Engineering

Theresa Kennedy, *Biomedical Engineering, University of Rhode Island*
BME 281 First Presentation, March 4, 2013 theresa_kennedy@my.uri.edu

Abstract- Over the past few decades biomedical engineering and sciences have made rapid advancements in the field of medicine. With such fast growth in technology new ethical problems are arising which demand an equal growth in the expansion of ethical reflection and codes. These codes of ethics have a large influence over biomedical research. With biomedical engineering professionals at the forefront of new medical innovations they must have greater interaction with moral and legal principle.

I. Introduction

For as far back as medical and engineering fields have existed so has ethical standards that regulate the professional performance of individuals in these fields. The Hippocratic Oath, for instance, adhered to by physicians today dates back to the ancient Greek Hippocrates. With the relatively new field of biomedical engineering that gained initial presence in the nineteenth century and has experienced rapid growth within the last few decades due to accelerated strides in technology combines these two disciplines as well as their codes of ethics. These ethics influence every aspect of the field holding it's professionals to a level of integrity and morality. With the continued development of new scientific theories and breakthroughs ethics must adapt to stay relevant to be efficacious. As biomedical engineering continues moving at an exponential growth rate so should the ethics that govern it.

A medical school class takes the Hippocratic Oath.

II. Methods

Ethical standards are determined by professional morality. Because of your profession, in this case biomedical engineering you have a certain ethics you adhere by that are set in place by the organizations that accredit professionals' skills. The ethical responsibilities of biomedical engineers integrate those of engineers and medical professionals, including a responsibility to follow the general ethical standards in research and development of technology and to obey to the specific standards set forth by medical ethics and bioethics. While biomedical engineers are not medical practitioners, they are indirect practitioners, since the technologies and techniques they develop co-determine medical practice and influence the medical field. In this case biomedical engineers follow ethic codes set forth by organization such as ABET (Accreditation Board for Engineering and Technology) and Hippocratic ethics adhered to by medical professionals.

III. Results

The results and effects of ethical standards are not as easily viewed as those of quantitative scientific research. When codes are followed the field flourishes, new research is developed that is undisputable and brings changes to the field and world forever. When codes of ethics are broken you may not be prosecuted legally but you lose professional credibility among peers and related elite organizations. An legal prosecution takes the form of tortes, or personal disputes. On example of an infamous misconduct case was that of Dr. Hwang Woo-Suk, a researcher and professor at Seoul National University, who claimed a series of breakthroughs in the field of stem cell research. In 2004 and 2005, Dr. Hwang published two papers in the journal Science that claimed his team had succeeded in creating human embryonic stem cells through cloning. However allegations from a co-worker followed stating that these papers were based on contrived data. As a result the papers were editorially retracted, Dr. Hwang lost his position at Seoul National University, and the South Korean government ended its financial and legal support of his research.

Dr. Hwang Woo-Suk

IV. Discussion

While the fast paced advancement of technology gives way to new and exciting developments in science and engineering fields it also requires more caution to be taken to remain true to widely accepted ethic codes. Professionals should never disregard ethics for self-interest in lieu of the greater interests for human kind.

References

[1]<http://guides.library.iit.edu/content.php?pid=31717&sid=301097>
[2]<http://www.utwente.nl/gw/wijsb/organization/brey/Publicaties_Brey/Brey_2009_Biomed_Engineering.pdf>
[3]<eng.odu.edu/ece/ECE486_487/Engineering_Ethics_SP13.ppt>