The Grand Challenge of Medical Engineering

Every day, people die due to lack of access to sufficient medical care. This problem continues to be reduced by progressions in engineering, but is still a major difficulty for many. People in all stages of life are constantly in need of affordable, efficient, and functional health care. Engineers are working diligently to create new, innovative ways to make medical machinery, instrumentation, devices, and implants inexpensive and beneficial to those in need; not only in this country but throughout the world. Therefore, it is likely that some of the most important breakthroughs occurring in the next century will be the advances in biomedical engineering.

Health care costs have soared in the past several years, posing a dilemma for everyone, especially those who have financial difficulties. Engineers are working to lower the costs of necessary medical care by designing and building more cost effective machines and materials that can be used to treat all types of diseases and injuries. It has been predicted that in the near future, new ideas for these devices could be the main focus of engineers. The creation of less invasive and more effective diagnostic tools, for example, could make it easier to determine the exact needs of the patients in a shorter amount of time. MRIs and X-Rays would be able to discover precise problem areas at the touch of a button. New artificial joints could be created with more flexible materials and increased durability, using breakthroughs in composite technology. Implants and artificial limbs will also receive the benefit of this technology, which will leave them virtually indestructible. At the same time, these advances need to be cost effective, accessible, and more automatic, thereby decreasing the need for human interaction. While the creation of these materials and products will be a challenge, making them affordable and accessible to the user will be an even greater challenge for engineers.

The human need for improved medical care is apparent in the United States, but not nearly as critical as in third world countries which lack the facilities that we have here. Engineers face the challenge of developing low cost, high quality tools that can be utilized by these disadvantaged nations who are in desperate need of cost effective and low maintenance equipment. The contribution that engineers can make in this regard is limitless. For example, organized teams of medical engineers could be instructed to build an easily installable organ, while metallurgical engineers could work on a cost efficient way of developing it. This combined approach could be repeated for any particular machine, instrument, or device needed.

Engineering has the potential to greatly improve the lives of people all around the world. One of the main challenges for engineers is to discover ways in which this potential can be put into actions, and then used to benefit mankind. During the remainder of the 21st century, advances in medical machinery, procedures, devices, and materials will become huge breakthroughs in the field of engineering. This is due to the obvious need for inexpensive health care that everyone desires. Although a grand challenge, engineers have the intellect, ambition, and ingenuity to create foundations for whole new possibilities in the world of medicine.