

## Lesson 3

### *Student Handout 3.1—Growth of Health-Care Technology*

In the past thirty years, health-care systems have seen rapid technological innovation throughout the industrialized world. Advocates see technology as a way to create a better life and believe that technological advancements continue because they benefit society, giving citizens healthier and longer lives. Others, particularly in the US, see society as being controlled by a “technological imperative.” This is the inclination to use a technology that has potential for some benefit, however marginal or unsubstantiated, based on a fascination with the technology itself, the expectation that new is better, and financial and other professional incentives. While the debate continues, medical technology continues to advance at an astounding rate. The development and use of modern health-care technology over the last few decades has been phenomenal. This can be seen particularly in cardiac technology, critical care medicine, reproductive technology, medical imaging, and the use of health-care computers.

Important innovations in cardiac technology include the cardiac pacemaker that helps keep the heart’s electrical activity paced properly, and the defibrillator, which maintains the rhythmic contractions of the heart to help avoid a heart attack. The first heart transplant was performed by Dr. Christian Barnard in 1967. Heart transplants, as well as numerous other organ transplants, are now performed on a routine basis.

Critical care medicine has seen significant advances, notably in treatment of cardiopulmonary patients, that is, those with insufficient heart and lung capacity. An estimated 20 percent of hospital patients require some form of respiratory therapy or support. Systems for maintaining adequate oxygen levels and mechanical ventilation for patients who are unable to breathe on their own are used routinely in hospitals.

Medical imaging techniques such as nuclear medicine, ultrasound, computer tomography (CT or CAT scans), and magnetic resonance imaging (MRI), allow pictures to be taken of internal bodily organs. MRI has become of fundamental importance in the medical field. In 2003, Paul Lauterbur and Sir Peter Mansfield were awarded the Nobel Prize in Medicine for their discoveries concerning MRI. Lauterbur discovered that gradients in the magnetic field could be used to generate two-dimensional images. Mansfield analyzed the gradients mathematically.

Computers have also changed the way health care is delivered. The Internet has produced numerous opportunities for sharing, obtaining, and discussing information. Some examples of medicine on the Internet are digitized medical journals, public health education, discussion groups, and education. In fact, many patients often research their own medical conditions on the Internet and feel free to question or challenge health care professionals based on their newfound knowledge. This change in access to medical information may have long-term implications for doctor and patient relationships.

Three areas of health-care technology that have received much attention in recent years but do not deal with issues of acute care are reproductive technology, plastic surgery, and eye surgery. The problem of infertility in both males and females has been partially eased in the past few decades owing to innovative techniques such as artificial insemination and *in vitro* fertilization (a technique in which egg cells are fertilized outside the woman's body). Increasingly, plastic surgery, which was originally developed as reconstructive surgery to treat disfigured soldiers from World War I, has given way to cosmetic surgery. Cosmetic surgery is a popular avenue for personal enhancement, as demonstrated by the 11.7 million cosmetic procedures performed in 2007 in the US alone. Eye surgery has also become quite popular, especially refractive surgery, which aims at correcting errors of refraction in the eye, reducing or eliminating the need for corrective lenses.

Sources: Consumer Guide to Plastic Surgery, <http://www.yourplasticsurgeryguide.com/trends/charts-graphs.htm>;  
Gregory L Weiss and Lynne V. Lonquist, *The Sociology of Health, Healing, and Illness* (Englewood Cliffs, NJ: Prentice Hall, 2000).



### **Magnetic Resonance Imaging (MRI) Scanner**

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