

1. EVOLUTION OF MEDICAL CARE

Did you know?



The striped barber pole is a symbol left over from the Middle Ages when barbers were also surgeons....

= they used to hang the bloody bandages out to advertise their shops.

- The most common treatment at the time was bloodletting.

How has medical care changed over time?

For as long as human beings have lived on this planet, we have practiced medicine in some form. The way our medical system (and others) works has changed immensely over time....



A) Ancient Times (3000 BC - 200 AD)

Primitive cultures credited health & illness to the moods of the Gods

= witch doctors used ceremonies to treat illness

Egyptian and Chinese priests combined medicine with religion, believing you had to treat both the body and the spirit

= treated the sick in temples using herbs and plants

= introduced therapies such as acupuncture and bloodletting

= embalmed the dead (gauze bandages)

Greek & Romans used reason to determine illness is a result of natural causes and added sanitation and diet to already established treatments.

= regarded as being the foundation of modern medicine

Hippocrates → Hippocratic Oath

Have you seen this symbol?

= The caduceus is a symbol for a physician, based on The Greek god of healing, Asclepius.



B) Dark Ages (400-800)

The study of medicine was prohibited due to the religious revival with priests and monks treating patients with prayer

= emphasis was on saving the soul (exorcisms)

- sometimes even 'surgery' was performed

= lobotomy to release evil spirits



C) The Middle Ages (800-1400)

Science & reason begin to replace spiritual causes for illness

= renewed interest in Greek and Roman medical practices

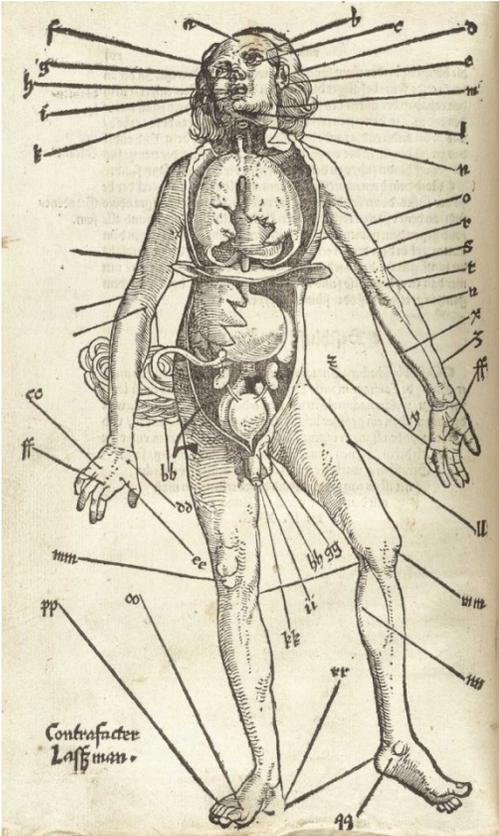
- notes are taken on cases

= knowledge is gathered and kept

- beginning of medicinal specialization
(physician vs surgeon)

- Surgeons (barbers) appear to practice
phlebotomy (bloodletting) to balance the body

- They also served with the military and treated
injuries sustained in battle, amputated limbs
and burned stumps to seal blood vessels



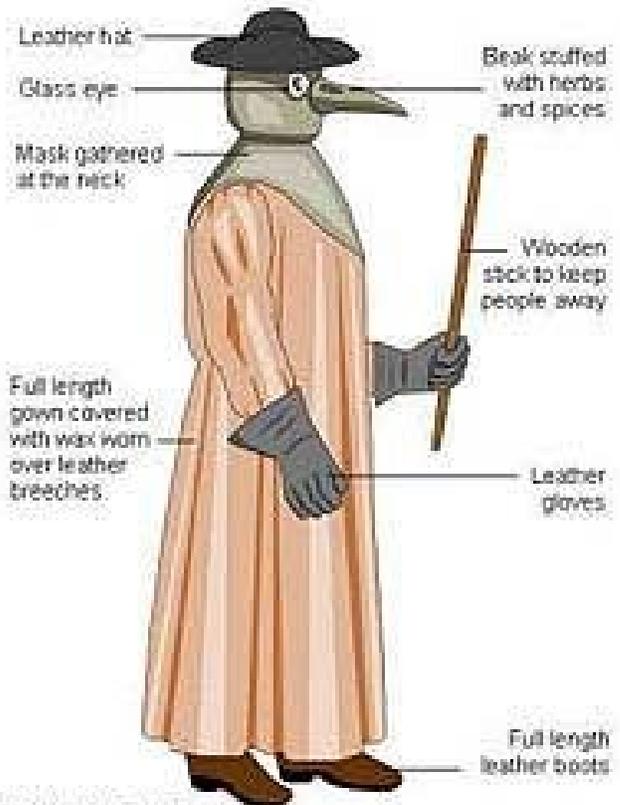
Plague Doctors

- Plague doctor duties often were limited to visiting plague victims to ascertain whether they had been afflicted or not.
- Often very well compensated financially for the risks they took.
- Most plague doctors were layperson volunteers as qualified doctors had often fled knowing they could do nothing.

Plague Doctors Clothing

- Considered one of the first examples of protective clothing for hazardous materials.

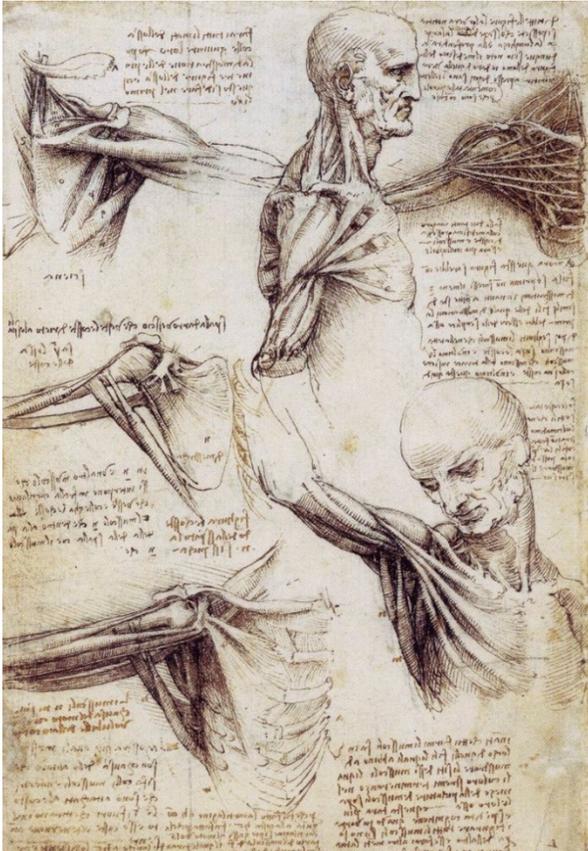
The Plague Doctor



D) The Renaissance (1400-1700)

Scientific method comes into use replacing guesswork and the supernatural

- invention of the microscope
- invention of the printing press = possible to publish medical books faster
- = leads to the enlightenment and studies of human anatomy



Leonardo da Vinci, who lived from 1452-1519, is well known for his anatomical sketches of the human body. He would dissect dead human remains and then draw what he saw.

Dissection was completely illegal unless one was a physician, which da Vinci was not. It is believed that da Vinci would get a grave robbers, and eventually a hospital director to get him cadavers to study. da Vinci hid all of this anatomical drawings and kept them secret because of the illegal nature of what he was doing. He was able to identify not only muscles and bones, but also their functions in the body, which was an incredible breakthrough. He dissected bodies illegally at first, but eventually got special permission from the catholic church to dissect and sketch what he learned for a medical book.

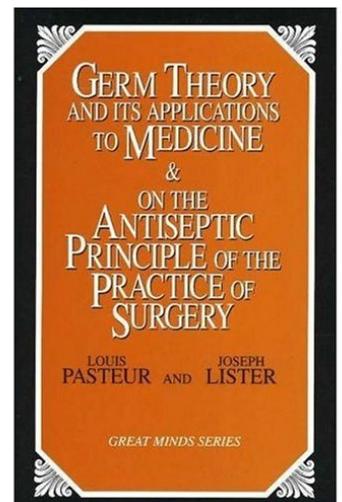
D. The Industrial Revolution (1800-1900)

Introduction of machines accelerates medical care advancements

- better microscopes = Microbiology
- connection between health & the environment is discovered
 - = pathogens cause disease (Pasteur) "Germ Theory"
 - = development of vaccines (cowpox for smallpox)

- modern medical practice is based on discoveries of the 19th century

= invention of stethoscopes → heart as a pump → circulatory system



E) Modern Times (1900- Present)

Discoveries in electronics and computers science changed medicine allowing the development of:

- new medicines

= antibiotics (infection), insulin(diabetes), radium (cancer treatment)

- new machines

= imaging (X-rays, CT scans, MRI, ultrasound), dialysis, ventilator

- new surgical techniques and treatment options

= laser surgery, organ transplants, fertility treatments (ICSI, IVF)

- based on 'Western Science'

= relies on certain laws that have been established through the application of the scientific method

Video: [Anthony Atala Growing Organs](#)

Growing a New Heart

The science-fiction dream of building human body parts is becoming a reality, but growing a heart will be tougher than other organs because of its size and complexity. Here's one method being tried by scientists in Spain.

1. A heart is removed from a cadaver.
2. The heart is rinsed with detergent, which washes away its cells over 3 to 4 days.
3. Stem cells are obtained from the bone marrow or fat tissue of the patient who needs a heart transplant.
4. After the heart's cells are removed, what remains is the heart's underlying support structure: a 'scaffold' of collagen.
5. The patient's stem cells are put onto the scaffold and placed into a bioreactor.
6. The bioreactor provides the right dose of nutrients, oxygen and chemicals—much like a womb—to stimulate the growth of the right heart cells. This produces a new heart for the patient that his body won't reject because it is made up of his own cells.

ADULT STEM CELLS

BIOREACTOR

COLLAGEN SCAFFOLD HEART

Source: Gregorio Marañón hospital

Joe Shoulak/The Wall Street Journal