Thinking Point---

How have historical discoveries helped to improve the healthcare we receive today?

Answer ---

Some treatments and “drugs” used in the past are still used. Those that failed were documented and thus not used if they failed.
You have an infected sore

The doctor uses leeches or maggots to treat the infection

Is this an ancient or modern treatment?

Does it work?
Why is it important to understand the history of healthcare?

- [https://youtu.be/i2mpgwGRJyw](https://youtu.be/i2mpgwGRJyw)
- Many treatments we use today were used in ancient times as well

  - [https://www.youtube.com/watch?v=jerqq06uxAo](https://www.youtube.com/watch?v=jerqq06uxAo)
  - [https://www.youtube.com/watch?v=6Xt6NWkgydM](https://www.youtube.com/watch?v=6Xt6NWkgydM)
Before drugstores, people used herbs and plants as food and medicine in the form of teas, poultices, etc.

Many of those same herbs are still in use today but are produced synthetically.

Morphine (pain management medication) is made from poppy plants.
**Ancient Times**

Beliefs were that diseases and illnesses were caused by demons/evil spirits

Treatment: Elimination of the evil spirits

- [https://www.youtube.com/watch?v=YoU_ru8yEc](https://www.youtube.com/watch?v=YoU_ru8yEc)
Ancient Times

As civilizations developed, changes occurred:

Study of the human body began as we began to wonder how the human body functions
Ancient Times

Religion played an important role

Common belief:

Illness/disease was seen as a punishment from the gods

Religious rites/ceremonies were used to eliminate evil spirits and restore health
Ancient Times

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Common belief:

Illness/disease was seen as a punishment from the gods

Religious rites/ceremonies were used to eliminate evil spirits and restore health
Ancient Times

Religion played an important role

- Exploration of the human body was limited as most religions didn’t allow the desecration of the human body.

- Animals were dissected to learn about body parts.
Ancient Times

Ancient Egyptians

* First people to keep written health records
* Many people couldn’t read as knowledge was limited to an educated few
* Most records were written on stone and were created by the priests who acted as physicians
• Ancient Egyptians
Ancient Times

Ancient Chinese

*Had strong beliefs in the need to cure the spirit and nourish the entire body

*Today holistic healthcare methods stress treating the entire patient - mind, body, and soul –

HOLISTIC HEALTHCARE
Ancient Times

Ancient Greeks

*Among the first to stress that a good diet and cleanliness would help prevent disease*
Ancient Times

- **Hippocrates (460 – 377 BC)**
  - *The Father of Medicine*
  - *One of the most important physicians in ancient Greece*

- *Authored code of conduct for doctors known as the “Hippocratic Oath” that is the basis of medical practice today*
• Hippocrates
Ancient Times

Ancient Greeks

Hippocrates

*Records created by him and other physicians helped establish that disease is caused by natural causes, and not by supernatural spirits and demons*
Ancient Times

Ancient Romans

Came to the realization that some disease was connected to filth, contaminated water, and poor sanitation.
Ancient Times

Ancient Romans

* Developed sanitary sewer systems
* Built sewers to carry away waste and aqueducts (waterways) to deliver clean water.
Ancient Times

Ancient Romans

* Drained swamps and marshes to reduce the incidence of Malaria

* Created laws to keep streets clean and eliminate garbage
Ancient Times

Ancient Romans

* Established the first hospitals
* Roman physicians cared for injured soldiers and ill people in their homes
*Many changes occurred in healthcare during ancient times, but treatment was still limited*

*The average person had*

*poor personal hygiene*
*drank contaminated water*
*very unsanitary living conditions*
*The average life span was 20-35 yrs of age

*Anyone who dies at this age today is considered to be a young person

• *Diseases such as typhoid, cholera, malaria, dysentery, leprosy, and smallpox infected and killed many individuals
Dark Ages

After the fall of the Roman Empire, the study of medicine stopped.

Individuals went back to living in filth with little to no personal hygiene.
Dark Ages

Epidemics of smallpox, dysentery, typhus, and the plague were rampant

Monks and priests stressed prayer to treat illness and disease
Middle Ages

*There was a renewed interest in Roman and Greek medical practices

*Monks translated writings of the Greeks and Romans and recorded that knowledge in handwritten books
Middle Ages

*Medical universities were created in the 9th century to train physicians how to treat illness.

*Arabs began requiring that physicians pass examinations and obtain licenses.
• **Renaissance Age**
  • 1350 to 1650 AD ---
  • “Rebirth of the Science of Medicine”
  • *Much information about the human body was found due to the acceptance and allowing physicians to dissect humans*
• **Renaissance Age**

• 1350 to 1650 AD ---

• “Rebirth of the Science of Medicine”

• *Doctors could view the body’s organs and see more accurately the connections between the body’s systems*
• **Renaissance**
• 1350 to 1650 AD ---
• “Rebirth of the Science of Medicine”
• *Artists like Michelangelo and Leonardo da Vinci were able to draw the body more accurately with them being able to dissect the human body*
• **Renaissance**
  • *Gutenberg printing press invented*
  • *Publication of medical books used by students at medical universities*
  • *Knowledge spread more rapidly*
  • *Physicians were more educated*
• **Renaissance**
• *Average life span increased to 30-40 yrs*
• *Common infections still claimed many lives because the actual causes of disease were still a mystery*
• **16th, 17th, and 18th Centuries**

• Physicians knowledge of the human body **greatly** increased

• **Harvey** described the circulation of blood

• **Fallopian** described the tympanic membrane in the ear and fallopian tubes in a female
• **16th, 17th, and 18th Centuries**

• Physicians knowledge of the human body greatly increased

• **Eustachio** identified the tubes between the ears and throat

• These discoveries inspired other physicians to investigate even more to see how the body functioned
Anton van Leeuwenhoek (1632-1723)

- **16th, 17th, and 18th Centuries**  *Invented the microscope lens that allowed visualization of organisms*

- *Scraped his teeth and observed the bacteria that causes tooth decay*

The microscope was a major development invented by Anton van Leeuwenhoek. The microscope is still one of the most major diagnostic tools in use today.
Benjamin Franklin (1706-1790)

- *16th, 17th, and 18th Centuries*

- Invented bifocals

- Found that colds could be passed from person to person
Ephraim McDowell (1771 -1830)

- *Surgeon from Danville, Ky.
- *Performed the first ovariotomy
- -(surgical removal of the ovary)
- to remove a 22 pound tumor
- [https://www.youtube.com/watch?v=T22fOp06dos](https://www.youtube.com/watch?v=T22fOp06dos)
16th, 17th, and 18th Centuries

Drugstores or Pharmacies started

*Apothecaries* (early pharmacists) made, prescribed, and sold medications

*Many medications were made from plants, roots and herbs very similar to those used in ancient times*
Drugstores or Pharmacies started developing the vaccine which prevents smallpox, a deadly disease at the end of the 18th century.
16th, 17th, and 18th Centuries

Drugstores or Pharmacies started

*Average life span increased to 40-50 yrs

*Cause of many diseases was still unknown and medical care and treatment was still limited to those of nobility and wealth
• **19th Century**

• The *Industrial Revolution*

• Major progress was achieved in medical science due to:

•
• 19th Century

• The Industrial Revolution

• René Laënnec invented the **stethoscope**

• This invention allowed a physician to listen to internal body sounds more clearly which greatly increased the knowledge of the functioning of the human body
• **Thinking Point ---**

• Physicians needed to hear heart and other body sounds to find out if there were problems with body organs

• **Question ---**

• *Before the origination of the stethoscope* how did a physician listen to body sounds?
• **Thinking Point ---**

  - Physicians needed to hear heart and other body sounds to find out if there were problems with body organs

• **Answer ---**

  - The physician would simply lay his head on the patient's body in the appropriate area and listen for any sounds they could hear
• **Thinking Point ---**

• The original stethoscope was simply a rolled up newspaper held to a patient's chest with the other end against the physician’s ear

• **Question ---**

• *How would this enable a physician to hear body sounds more clearly versus how they had been doing it before?*
• **Thinking Point ---**

  The original stethoscope was simply a rolled up newspaper held to a patient's chest with the other end against the physician’s ear

• **Answer ---**

• *Sounds could travel to the ear without much outside noise or interference*
• **19th Century**
  - Known as the **“Industrial Revolution”**
  - The original stethoscope quickly evolved into a wooden tube that pressed against the physician’s ear

• [Development of the Stethoscope](#)
Florence Nightingale (1820-1910)

- Known as the “Founder of Modern Nursing”
- Established efficient and sanitary nursing units during the Crimean War in 1854
- Invented the call bell system and use of dumbwaiters to deliver meals
- Begin the professional education of nurses

https://www.youtube.com/watch?v=o0FWqDl0YyS
• **19th Century**
  • Formal training for nurses began
  • Florence Nightingale is known as the ---

  • “Founder of Modern Nursing”
• **19th Century**

• *Infection Control* was another major development in this time period

• * Physicians began to associate the tiny microorganisms observed with the microscope with diseases
Louis Pasteur (1822-1895)

- Known as the “Father of Microbiology”
- His germ theory proved that microorganisms cause disease
- Proved that heat can be used to destroy germs through a process called pasteurization
- Created a vaccine for rabies in 1885
- Founded the basic rules for sterilization
- Louis Pasteur
Joseph Lister (1827-1912)

• *Used carbolic acid on wounds to kill germs
• *First doctor to use an antiseptic during surgery
• * [Joseph Lister]
• **19th Century**
  
  - Women became active participants in medical care
  - Elizabeth Blackwell was the first female physician in the United States

  • [Elizabeth Blackwell](#)
• **19th Century**
  • Women became active participants in medical care
  • Dorothea Dix was appointed as the Superintendent of Female Nurses of the Army
Clara Barton (1821-1912)

- *Volunteer nurse for wounded soldiers during the Civil War
- *After Civil War, established a bureau of records to search for missing men
- *Campaigned for the USA to sign the Treaty of Geneva, which provided relief for sick and wounded soldiers
- *Formed American Red Cross in 1881 and served as its first president
• **19th Century**
  
*Average life span for most increased to 40-65 yrs*

*Treatment for disease more specific after causes of disease were identified*
• **19th Century**
• Many vaccines and medications were developed:
  • 1879  First vaccine for cholera
  • 1885  First vaccine for rabies
  • 1890  First vaccine for tetanus
  • 1896  First vaccine for typhoid fever
  • 1897  First vaccine for bubonic plague
Robert Koch (1843-1910)

- *Developed the culture plate method to identify pathogens*
- *Isolated the bacterium that causes tuberculosis*
Wilhelm Roentgen (1845-1923)

- Discovered roentgenograms (Xrays) in 1895
- Let doctors see inside the body
- X-rayed wife’s hand
- X-rays
Sigmund Freud (1836-1939)

- Discovered the conscious and unconscious part of the mind
- His studies were the basis for psychology and psychiatry
Sir Alexander Fleming  
(1881-1955)

• *Discovered penicillin in 1928 which is considered one of the most important discoveries of the twentieth century
20th Century

• *Showed the most rapid growth in healthcare

• *Causes for many diseases were identified due to technological advances in previously invented medical equipment

• *Physicians became more able to treat the causes of diseases thus producing more cures for their patients
- *20th Century*

- Healthcare plans created to help pay costs of care
- Healthcare Standards were created
- Computer technology has been greatly influential and has contributed greatly to advances in medical science
- Computers are used in every aspect of healthcare
• **20th Century**

• *Increased knowledge about the role of blood in the body*

• *ABO blood groups discovered*

• *Found out how white blood cells protect against disease*

• *New medications were developed*

  • *Insulin discovered and used to treat diabetes*

  • *Antibiotics developed to fight infections*

  • *Vaccines were developed*
20th Century (continued)

• *New machines developed
  • *Kidney Dialysis Machine
  • *Heart Lung Machine
  • *Surgical and diagnostic techniques developed to cure once fatal conditions

• *Organ Transplants
• *Test tube babies
• *Implanted first artificial heart
• *Influenza pandemic killed more than 21 million in 1918
• *Birth control pills approved by US FDA in 1960s
• 20th Century
• Infection control helped decrease surgical infections that used to kill many patients
• **20th Century**
  
  * Average life span increased to 60-80 yrs and beyond

  * NOT unusual to see people live to be 100 yrs of age
Jonas Salk (1914–1995)  
Albert Sabin (1906 – 1993)

- Discovered polio vaccine
- Saved many people from this virus that paralyzed thousands of adults and children each year.

Dr. Sabin administers his oral vaccine to two Cincinnati children, ca. 1960
Francis Crick (1916 – 2004)  
James Watson (1928 -  )

- Described the structure of DNA and how it carries genetic information in 1953
- Built a three-dimensional model of the molecules of DNA
- Shared the Noble Prize in 1962
- Crick & Watson
• The first open-heart surgery in the 1950s has progressed to the heart transplants that occur today.
• Surgical techniques have developed cures for what were once fatal conditions.
Robert Jarvik

• Creator of the first artificial heart

• On December 2, 1982, it was implanted into Barney Clark, who lived for the next 112 days

• The second patient, William Schroeder, lived for 620 days
Ben Carson (1951 - )

- *Famous for his surgeries to separate Siamese twins
- *Currently Director of Pediatric Neurosurgery at John Hopkins
- *He has refined hemispherectomy, a surgery on the brain to stop seizures
- *Currently running for president
21\textsuperscript{st} Century

• *Stem cells were used in the treatments of disease early in the 2000’s and lead to increased research in the treatment of cancer and other diseases

• *President George W. Bush approved federal funding for research using only existing lines of embryonic stem cells in 2001

• *Advanced Cell Technology announced it cloned a human embryo in 2001 but the embryo did not survive

• The U.S. FDA approved the use of the abortion pill RU-486 IN 200
• 21st Century

Potential uses of **Stem cells**

- Stroke
- Traumatic brain injury
- Learning defects
- Alzheimer's disease
- Parkinson's disease
- Baldness
- Blindness
- Deafness
- Amyotrophic lateral-sclerosis
- Wound healing
- Bone marrow transplantation (currently established)
- Spinal cord injury
- Osteoarthritis
- Rheumatoid arthritis
- Myocardial infarction
- Muscular dystrophy
- Diabetes
- Crohn's disease
- Multiple sites: Cancers
Embryonic Stem Cell Research:

Stem cells

When cultured, a stem cell has the ability to reproduce specialized cells (such as brain cells) for an indefinite period.

Where do stem cells come from?

1. Stem cells can be isolated from a human embryo in early development. These are obtained with the consent of donor parents at in-vitro clinics.

2. Stem cells can be derived from fetal tissue obtained from terminated pregnancies with donor consent.

3. A normal egg cell has the nucleus removed and the cell is fused with any other body cell. These cells are not as versatile and healthy as ones obtained in the two processes above.

Human cell: Each cell's function is determined by the proteins (amino acids) it produces through DNA blueprints.

Types of stem cells

Totipotents — At this point these cells have the ability to become anything from a complete human being to any type of tissue cell.

Pluripotents — These cells are derived from the inner cell mass of a blastocyst. Pluripotents can reproduce a number of tissue cells but do not have the ability to produce an entire human.

Multipotents — The more specialized stem cells are found in both adults and children. These stem cells are responsible for replenishing everything from our skin cells to blood cells throughout our lives.

Cell development

Fertilized egg

Totipotent cells

Pluripotents extracted

Blastocyst

Fetus

Human

Stem-cell uses

Stem cells are used in human development research (cell decisionmaking and specialization), drug development (drug testing on individual types of cells), and cell therapy (regeneration of damaged tissue with stem cells).

SOURCE: National Institutes of Health, May 2000
• The threat of bioterrorism lead to smallpox vaccination of the military and first responders in 2002

• The Netherlands became the first country in the world to legalize euthanasia in 2002

• The Human Genome Project to identify all of the approximately 20,000 to 25,000 genes in the human
• 21st Century
• FDA approved Abortion pill RU-486 in year 2000
• Embryo cloned in 2001 but it didn’t survive
• 1st totally implantable artificial heart was place in a patient in Louisville KY 2001
21st Century

• *The standards for Privacy of Individually Identifiable Health Information, required under the Health Insurance Portability and Accountability Act (HIPPA) of 1996, went into effect in 2003

• *The Medicare Prescription Drug Improvement and Modernization Act was passed in 2003

• *Vaccinations for cervical cancer and herpes zoster (shingles) in 2006
Potential for 21st Century

- *Cures for AIDS, cancer, and heart disease
- *Genetic manipulation to prevent inherited disease
- *Nerves in the brain and spinal cord are regenerated to prevent paralysis
- *Antibiotics are developed that do not allow pathogens to develop resistance
- *Average life span 90-100 years
21st Century

- Major threats to healthcare
- Bioterrorism ---
- Microorganisms or biologic agents used as weapons to infect large numbers of humans
- This is a very real and present threat
• 21st Century
• Major threats to healthcare
• New viruses, such as the bird flu virus, can mutate and cause disease in humans
• **21st Century**
  • Major threats to healthcare
  • **Pandemics** (worldwide epidemics) could occur quickly in this global society because people can travel easily from one country to another
• **21st Century**

• Positive Points

• Scientists now have computers and rapid methods of communication to share new knowledge
• **21st Century**

• Positive Points

• The [World Health Organization](#) otherwise known as [WHO](#), an international agency sponsored by the United Nations

• WHO provides constant monitoring of health problems throughout the world and then they take steps to help prevent pandemics
• 21st Century
• Positive Points
• Healthcare is of global concern
• Countries work together to promote good health in all individuals
• **Discussion**
  • When did most of the significant changes in healthcare occur?
  • Why were the greatest advances made in this time period?
  • What are some possibilities for the future of healthcare?
• **Summary**
• Healthcare has seen many changes over the centuries
• Future changes may be even more dramatic


• **STUDENT REPORT ---**

• **Your Assignment:**

  Be sure to give your reasoning as to why you feel it was a significant event.

  Give at least one prediction as to a medical event that would be a medical discovery or breakthrough in the future of medicine.