



# History of Healthcare

Modern times  
1900-present



# 20th Century (1900-1999)

- Showed the most rapid growth in healthcare so far.
- Causes for many diseases were identified due to technological advances.
- Physicians became more able to treat the specific causes of diseases thus producing more cures.



# 20th Century (1900-1999)



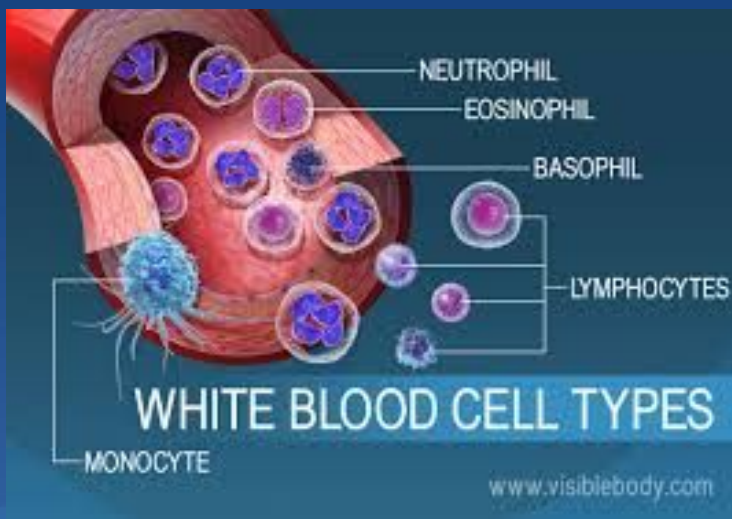
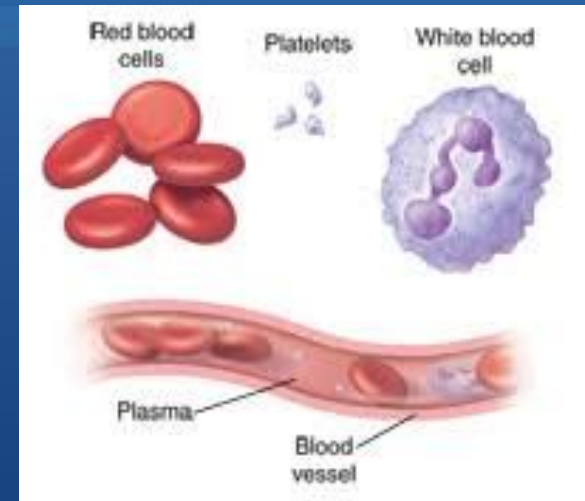
- Healthcare plans created to help pay costs of care.
- Healthcare standards were created.
- Computer technology greatly contributed to advances in medical science and are used in every aspect of healthcare.



# 20th Century (1900-1999)

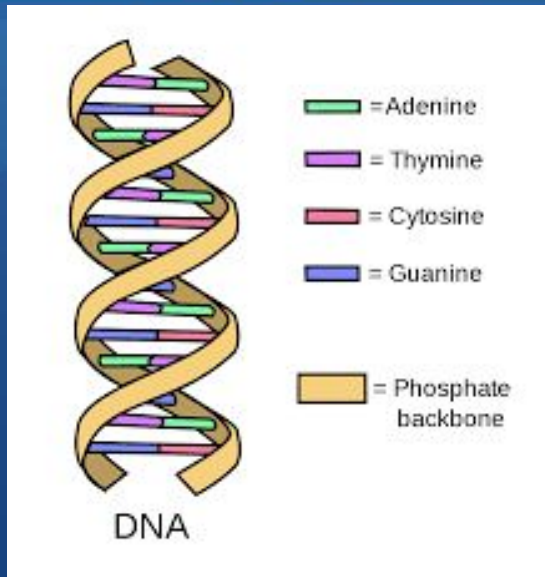


- Increased knowledge about the role of blood in the body
  - ABO blood groups discovered
  - Discovered how white blood cells protect against disease



TYPE	YOU CAN GIVE BLOOD TO	YOU CAN RECEIVE BLOOD FROM
A+	A+, AB+	A+, A-, O+, O-
O+	O+, A+, B+, AB+	O+, O-
B+	B+, AB+	B+, B-, O+, O-
AB+	AB+	EVERYONE
A-	A+, A-, AB+, AB-	A-, O-
O-	EVERYONE	O-
B-	B+, B-, AB+, AB-	B-, O-
AB-	AB+, AB-	AB-, A-, B-, O-

# 20th Century (1900-1999)



- The structure of DNA and research in gene therapy (ongoing today)

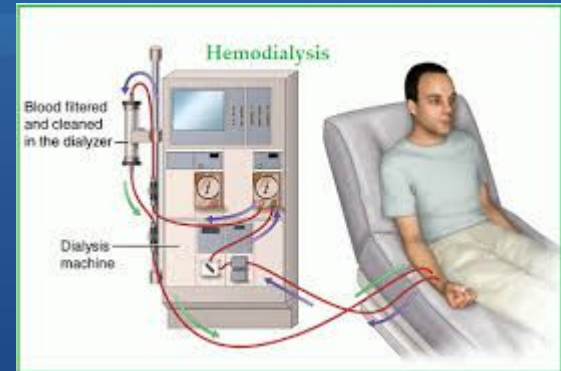


- New medications were developed
  - Insulin discovered and used to treat diabetes
  - Antibiotics developed to fight infections
  - More vaccines developed

# 20th Century (1900-1999)



- New machines developed
  - Kidney dialysis machine
  - Heart lung machine
- Surgical and diagnostic techniques developed to cure once fatal conditions
  - Organ transplants
  - Implanted first artificial heart
- Birth control pills approved by US FDA in 1960s
- Test tube babies



# 20th Century (1900-1999)



- Infection control helped decrease surgical infections that used to kill many patients.





# 20th Century (1900-1999)

## 1918--Spanish flu epidemic (3 min)



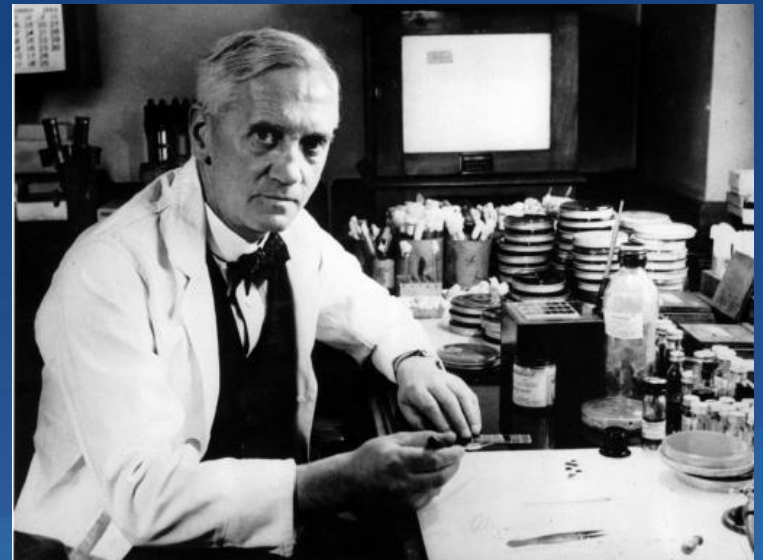


# 20th Century (1900-1999)



## 1928--Sir Alexander Fleming

- Discovered penicillin which is considered one of the most important discoveries of the twentieth century



# 20th Century (1900-1999)



## 1953--Francis Crick & James Watson (3 min)

- Described the structure of DNA and how it carries genetic information.
- Built a three-dimensional model of the molecules of DNA.
- Shared the Nobel Prize in 1962.



# 20th Century (1900-1999)



## 1955--Jonas Salk & Albert Sabin

- Both discovered polio vaccine
- Salk's vaccine was an inactivated virus vaccine
- Sabin's vaccine was an oral vaccine
- The inactivated vaccine is used in US today
- Saved many people from this virus that paralyzed thousands of adults and children each year.

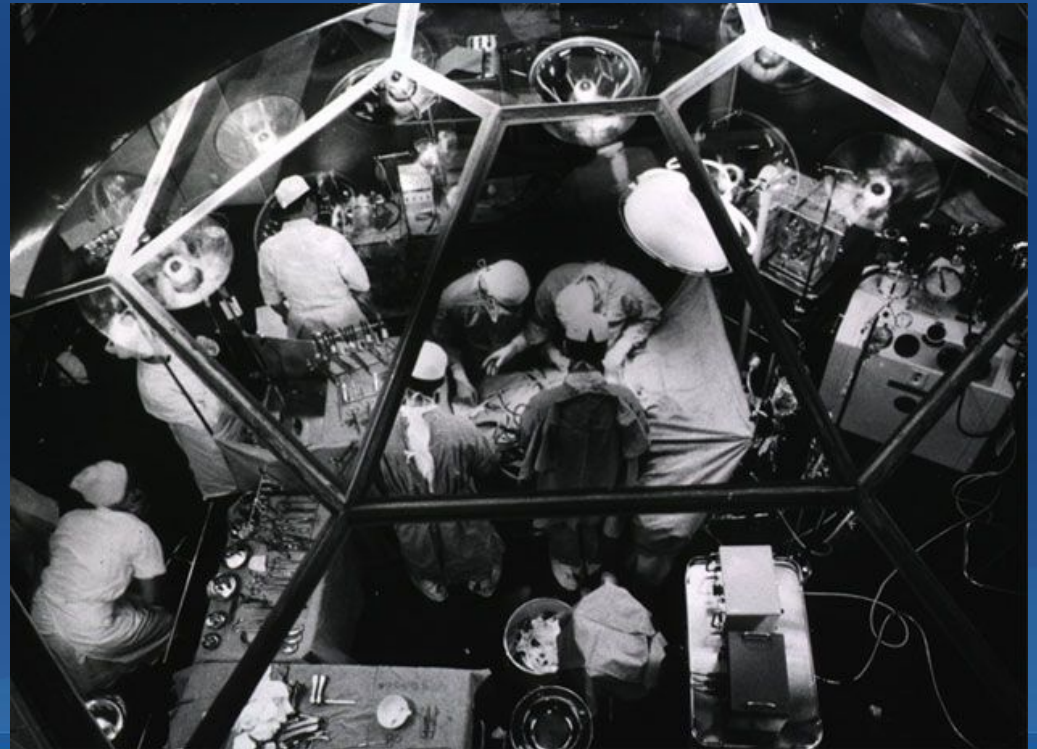


# 20th Century (1900-1999)



## 1967--Christian Barnard (2 min)

- Performed first human-to-human heart transplant.

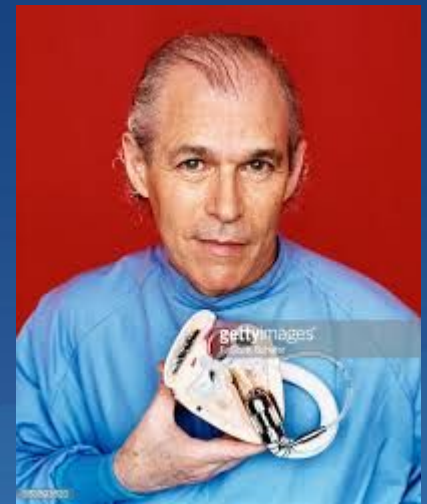


# 20th Century (1900-1999)



## 1982--Robert Jarvik

- Creator of the first artificial heart
- On December 2, 1982, it was implanted into Barney Clark, who lived for 112 days afterwards
- The second patient, William Schroeder, lived for 620 days



# 20th Century (1900-1999)



- Average life span increased to 60-80 yrs and beyond
- NOT unusual to see people live to be 100 yrs of age

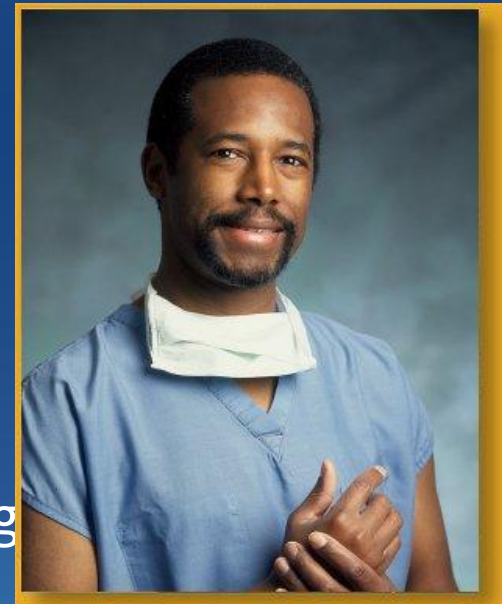




# 20th Century (1900-1999) & 21<sup>st</sup> Century (2000-present)

## Ben Carson

- Famous pediatric neurosurgeon
- Refined/perfected the procedure of hemispherectomy-- surgery on the brain to stop seizures in 1985.
- First to surgically separate conjoined twins in 2004
- Served as Director of Pediatric Neurosurgery at John Hopkins until retiring in 2013.
- Ran for the Republican nomination in 2016 presidential election
- Is the current United States Secretary of Housing and Urban Development



# 20th Century (1900-1999) & 21<sup>st</sup> Century (2000-present)

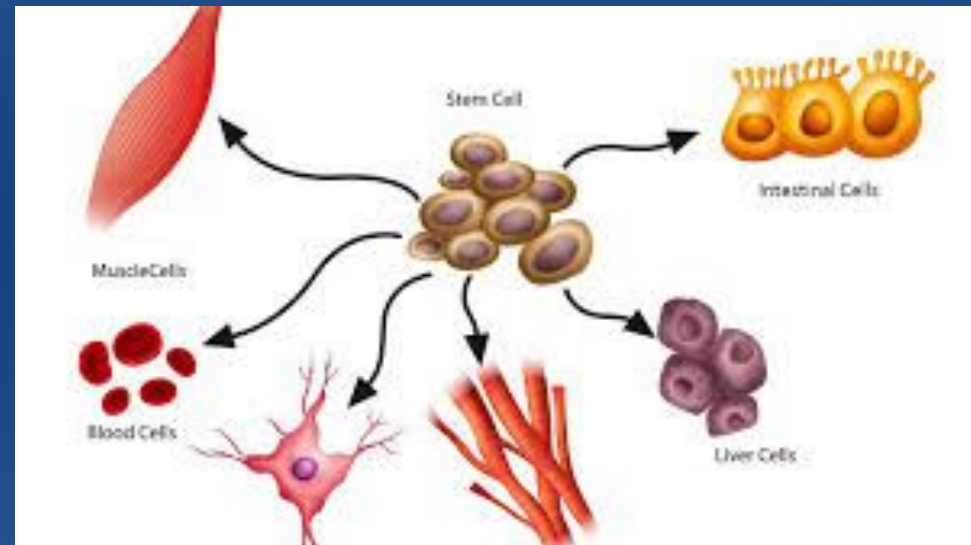






# 21<sup>st</sup> Century (2000-present)

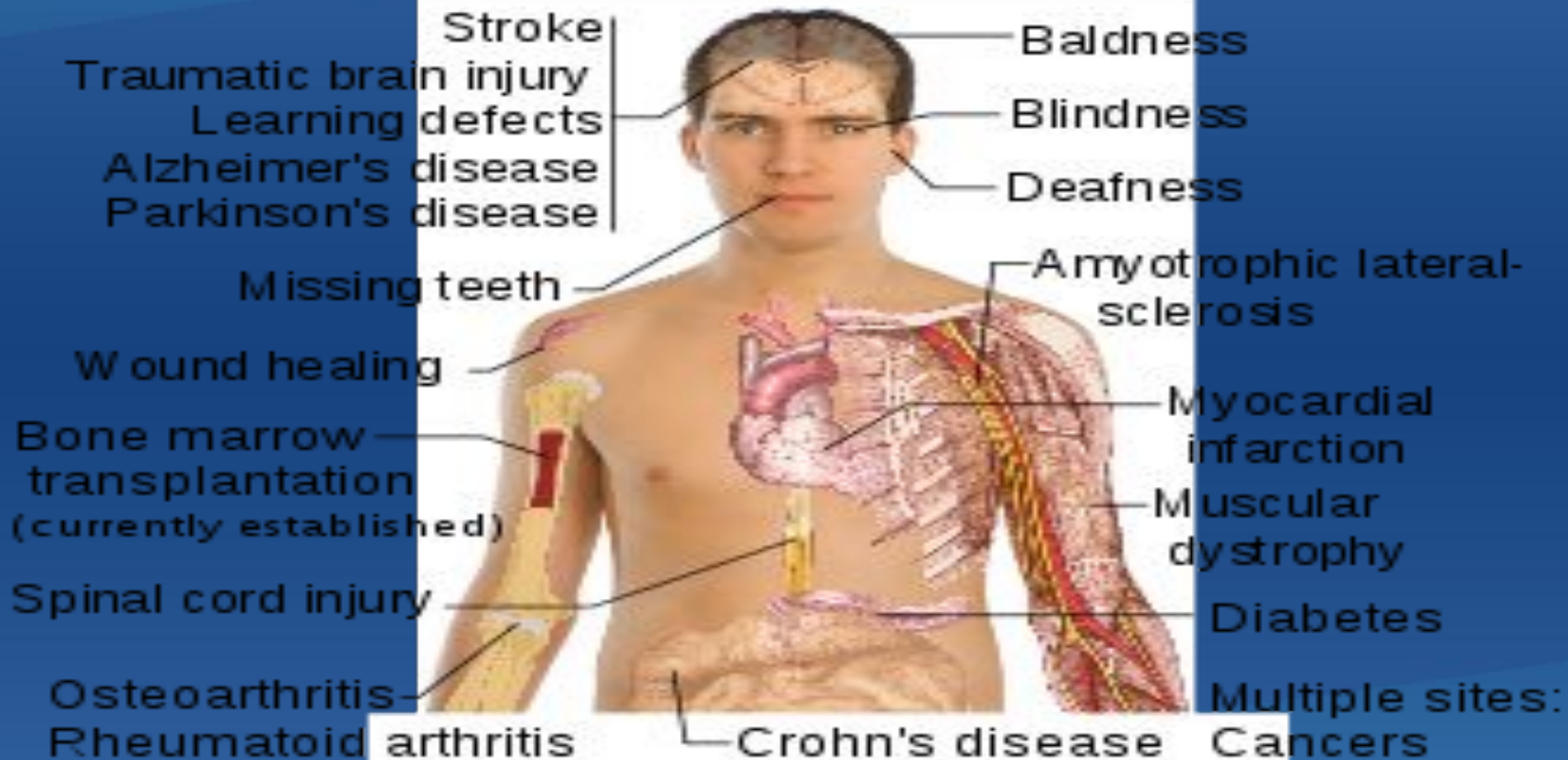
- Stem cells (1 min) used in treatment of disease early in the 2000's and lead to increased research in the treatment of cancer and other diseases.
- Stem cells can be programmed to become any type of cell in the human body so there is enormous potential for curing diseases and repairing damaged tissues.





# 21<sup>st</sup> Century (2000-present)

## Potential uses of **Stem cells**





# 21<sup>st</sup> Century (2000-present)

- Why is stem cell research and the use of stem cells controversial?
  - It is ethically and politically controversial because it involves the destruction of human embryos.
  - In the United States, the question of when human life begins has been highly controversial and closely linked to debates over abortion.

# 21<sup>st</sup> Century (2000-present)



- 2000--FDA approved RU-486 (abortion pill) .
- 2001--1<sup>st</sup> totally implantable artificial heart was placed in a patient in Louisville KY.
- 2001-Advanced Cell Technology cloned a human embryo but the embryo did not survive






# 21<sup>st</sup> Century (2000-present)

- 2001-Results of the Human Genome Project to identify all of the approximately 20,000 to 25,000 genes in the human are published.
- 2002-the threat of bioterrorism lead to smallpox vaccination of military and first responders.
- 2002-The Netherlands became the first country in the world to legalize euthanasia.



### Why Smallpox Bioterrorism?

- Stable aerosol Virus
- Easy to Produce
- Infectious at low doses
- Human to human transmission
- 10 to 12 day incubation period
- High mortality rate (30%)



# 21<sup>st</sup> Century (2000-present)

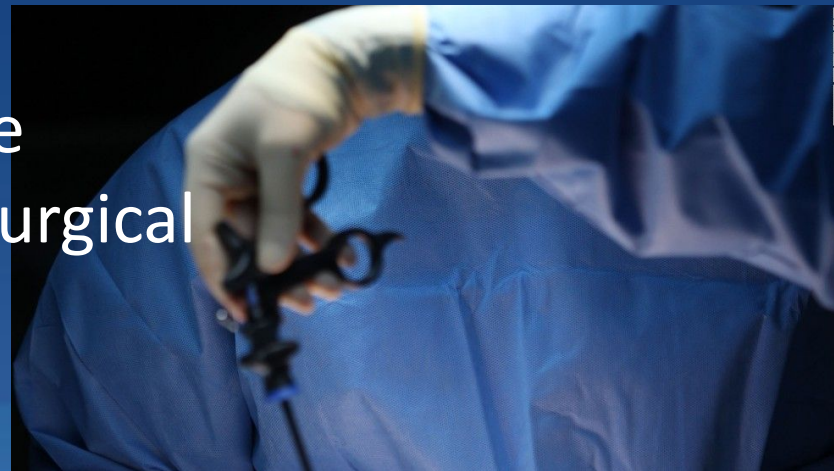
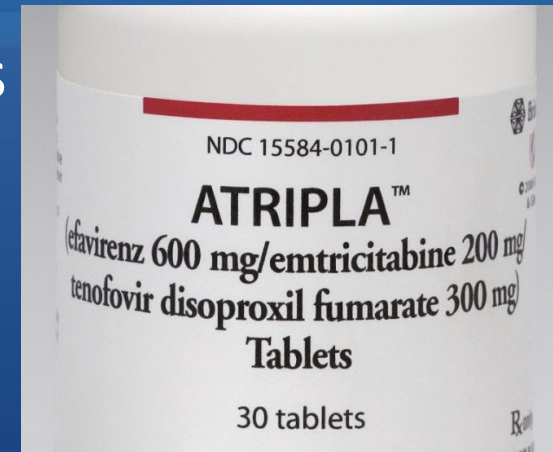
- 2003--Standards for Privacy of Individually Identifiable Health Information, required under the Health Insurance Portability and Accountability Act (HIPAA) of 1996, went into effect.
- 2003--Medicare Prescription Drug Improvement and Modernization Act passed.
- 2006--Vaccinations for cervical cancer (Gardasil) and herpes zoster/shingles (Shingrix).



# 21<sup>st</sup> Century (2000-present)



- 2006--HIV “cocktail” pill developed thus decreasing complexity of treatment.
- Targeted cancer treatments that interfere with spread of cancer or target and kill specific cancer cells.
- Laparoscopic surgical procedures/”minimally invasive procedures” reduce pain and surgical recovery time.



# 21<sup>st</sup> Century (2000-present)



- 2008--first full face transplant in the US.
- By 2013--over 560 US cities & 28 states have an indoor “no smoking” policy.
- 2013--bionic limbs using computer technology for design & operation.







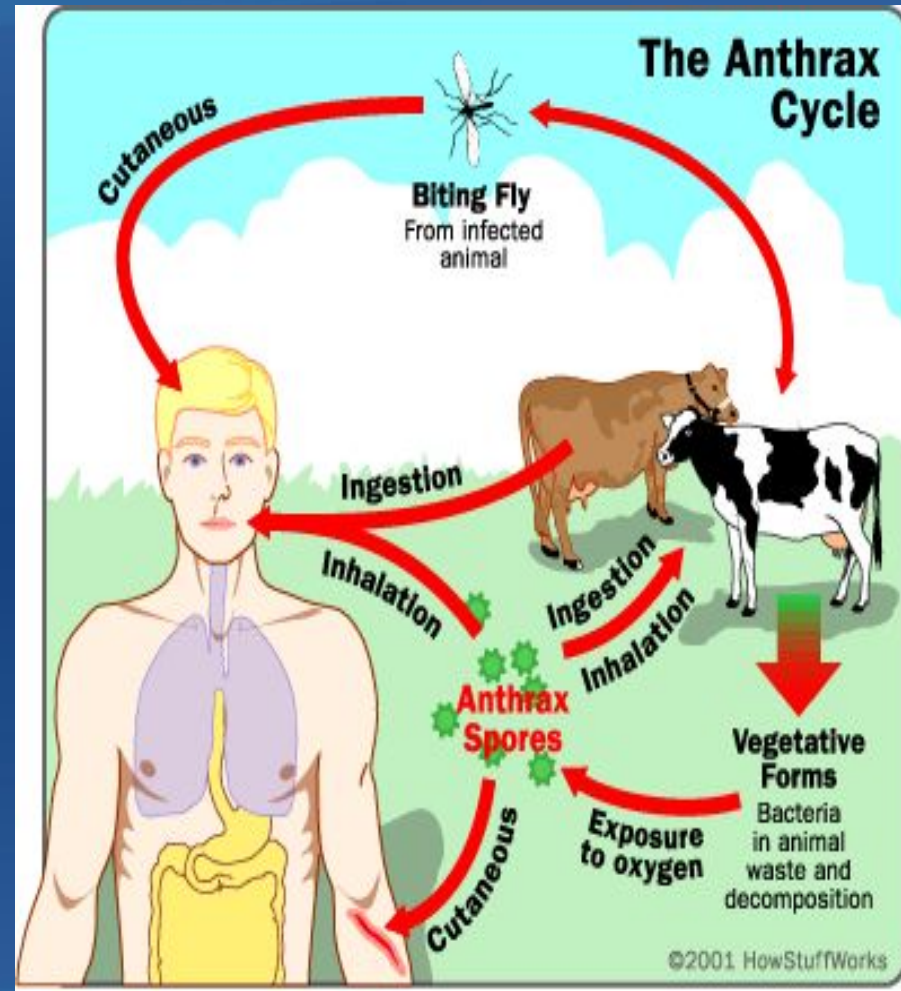
# Potential for 21<sup>st</sup> Century

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



# Potential for 21<sup>st</sup> Century

- Major threats to healthcare
  - **Bioterrorism**
    - microorganisms or biologic agents used as weapons to infect large numbers of humans





# Potential for 21<sup>st</sup> Century

- **Bioterrorism**
- A very real and present threat
- Microorganisms at most risk for use:
  - Anthrax (*Bacillus anthracis*)
  - Botulism (*Clostridium botulinum* toxin)
  - Plague (*Yersinia pestis*)
  - Smallpox (*variola major*)
  - Tularemia (*Francisella tularensis*)
  - Viral hemorrhagic fevers (filoviruses [e.g., Ebola, Marburg] and arenaviruses)





# Potential for 21<sup>st</sup> Century

- Major threats to healthcare
  - New viruses, such as the bird flu virus, can mutate and cause disease in humans
  - We are seeing exactly what this means in the form of COVID-19
    - It is believed to have zoonotic origins and has close genetic similarity to bat coronaviruses, suggesting it emerged from a bat-borne virus.





# Potential for 21<sup>st</sup> Century

- Major threats to healthcare
  - Pandemics (7 min) (worldwide epidemics) could occur quickly in our global society because people can travel easily from one country to another, again as we are seeing with COVID-19.



# Positive points for 21st century

- Scientists have rapid methods of communication to share new knowledge
- The **World Health Organization (WHO)**, provides constant monitoring of health problems throughout the world and take steps to help prevent pandemics.