• **Galen** contributed most to surgery and the anatomy e.g. he found out the brain controlled speech

• His dissections were conducted on animals meaning that some of his discoveries about the human body were wrong (similar to Aristotle).

• Wrote over 60 texts.

• Ideas were continual of Hippocrates’ e.g. - he believed in the four humours theory
  - observation before diagnosis
  - the importance of a balanced diet and exercise

• Founder of Opposites Theory: adaption of the four humours e.g. Give patients with a high temperature a cold cucumber to cool them down (which worked in some cases e.g. letting out phlegm by blowing your nose after heating a hot chilli cools the body down).

• He also believed the air had ‘seeds of disease’ and caused illness when inhaled, however did not investigate this further- his researched was limited by non-existence of the microscope (technology).

• Galen’s ideas were so popular with the medieval Christian Church because his recordings reflected the idea that the human body was a ‘marvellous machine’ that was perfect by design. This idea of perfection correlates with the idea that it was made by God and he created humans “in his own image”
The Medieval Age

- British citizens had only Galen’s books, religion and the local old woman who made herbal remedies
- *Supernatural treatments of disease* – Flagellants whipped themselves to cleanse their sins and avoid the Plague
  - A touch from the monarch was thought to cure Tuberculosis
  - Edward II’s doctor cured his son of smallpox in 1314 by allowing only red items by his bed

- *Public Health* - **Population surge** led to overcrowding, so more dirt and easier transmittance of disease
  - People built toilets over streams. After these clogged up they began tipping waste out of chamber pots into the streets.
  - Cesspits were unlined and built next to fresh water supplies, like wells
  - Transport by horse and cart meant there was plenty of horse excrement on the street
  - Animals were butchered for meat on the streets, which also attracted rats with fleas

- Tackling public health – The efforts to combat it were ineffective (too little, too late)
  - The rich left money in their will for refurbishment of public toilets e.g. Famous mayor Dick Whittington left enough money in his will for a 64 seated restroom
  - Cesspits were banned from being dug within a certain distance from wells
  - ‘Muck rakers’ were hired to rake horse excrement from the streets
  - People were fined for littering
Medieval Medics

• **Doctors** – Only men could be doctors because the profession required a university degree
  - Only men could go to university
• **Barber Surgeons** – Could be men or women, as it was achieved by apprenticeship
  - They conducted simple surgery like pulling out teeth, cutting away haemorrhoids or mending broken bones
• **Midwives** – Only women could be midwives because they were cheap
• **Apothecaries** – Concocted herbal remedies
  - Could not write so ideas weren’t communicated
  - Accused of by some as ‘quacks’ because they were unlicensed and inferior to doctors
  - An apothecary called Jacoba was arrested in Paris for being unlicensed, despite evident success at healing people

Some towns had a **wise woman healer**, however female healers became less popular over the Renaissance period due to rising expectations of medical qualifications and fears of witchcraft

• **Hospitals** gave wealthy clients the nicest rooms, in hope for a charitable donation from the client
• Hospitals tried to save money by putting two people in the same bed- not good!
The Renaissance

- Science and Technology – The Printing Press improved speed of broadcast and communication
  - Meant more people were exposed to new ideas because monks no longer controlled the copying of textbooks and ancient scriptures
- The Obstetric Forceps were invented by Peter Chamberlen in 1620 to ease the obtainment of babies from the womb (however midwives could not use them because only those with anatomical training at university could use them)
- The Watermill inspired William Harvey to question Galen’s ideas about the circulation of blood around the body
- The invention of the Lense improved vision, which meant small anatomical features like infectious germs and the blood capillaries could be seen and analysed through microscopes
- Renaissance art was an improvement in detail from medieval art: drawings were completed more elaborately to scale with perspective
  - Da Vinci was particularly famous for his anatomical drawings which were engraved into copper, then imprinted medical books by printing press
- The set up of The Royal Society allowed innovators such as Sir Isaac Newton to meet and discuss scientific ideas. It still exists today
- Discovery of the Americas and West Indies meant there were new plants available for new remedies
Paracelsus

- Name means “Greater than Celcus” (Celcus was a very successful Roman doctor)
- Burnt Galen’s books and Ibn Sinna’s encyclopaedias in public
- Prescribed cures with sulphur and mercury instead of purging
- Devote Christian, so believed God had secretly hidden cures for disease in nature, for example he thought the orchid plant could cure STDs, because its bulb was the shape of a testicle
- Influenced people to question their faith in beliefs of Galen
William Harvey

- 1578 – 1657
- English doctor to King James I and King Charles I
- Benefitted from the previous work of Vesalius and Paracelsus, who made it acceptable to criticize Galen
- Fascinated by the anatomy of a heart so dissected on frogs because they had a slow heartbeat
- Inspired by the water pump to question Galen’s ideas about how blood flowed around the body
- His work was based on his own research and not traditional Roman ideas
- *Individual Genius* - His work was achieved to exceptional detail and investigations were repeated
- His experiments proved that – Valves in the blood vessels closed once blood had passed through, so blood can only travel around the body in one direction
  - The amount of blood going into the arteries per hour was 3x the weight of man
  - The heart was a pump that caused blood to flow around the body
- His ideas weren’t taught in universities until fifteen years after his death
- Could not prove how blood flowed from the arteries to the veins because the microscope hadn’t been invented yet
Discovery of the Human Genome

• Genes were discovered by Gregor Mendel in 1863
• Studies of the DNA could not be developed into much depth because the electron microscope hadn’t been invented yet
• In 1953, James Watson and Francis Crick discovered the DNA had a double helix structure
  This meant scientists could effectively pull both helixes apart and analyse the coding on the inside
• Watson and Crick also found out how characteristics were passed down in the genes
• In 1976, this knowledge was applied to human illness
• In 1984, the first defective gene responsible for disease was identified
• In 1986, the Human Genome Project was established to analyse the entire sequence of human DNA
  This study took 15 years to complete
• DNA gives information on human anatomical relationships with animals and is vital for cloning and curing for genetic disorders
• DNA is used to find cures for Cancer and AIDS
• Controversial because some people may not want to know whether they will die young
  Hereditary illnesses can cause loss of jobs and mortgage