

## Medicine stands still: Ancient and Islamic

### KEY WORDS

**Medicine:** The science or practice of the diagnosis, treatment, and prevention of disease or a drug or other preparation for the treatment or prevention of disease.

**The four humours:** The belief that the body has four liquids (humours) which must be in balance to keep the body healthy.

**Symptom:** A physical or mental sign that something is wrong with the body or mind.

**Caliph:** The name given to the leader of Sunni Islam.

**Diagnosis:** When a doctor identifies the illness which a patient has.

**Symptom:** A physical or mental sign that something is wrong with the body or mind.

**Secular:** Something which is not connected to religion.

**Baghdad:** A city, which is now the capital of Iraq which was the largest city in the Islamic Empire during the Middle Ages.

**Physician:** A person who cures moral or spiritual ills; a healer, or a person qualified to practise medicine, especially one who specializes in diagnosis and medical treatment.

**Encyclopedia:** A book or set of books giving information on many subjects or on many aspects of one subject and typically arranged alphabetically.

### KEY INDIVIDUALS

**Hippocrates:** Ancient Greek physician who created the theory of the four humours. Known as the father of Medicine

**Galen:** Physician in ancient Rome who developed Hippocrates' theories further (e.g. The Theory of Opposites) and wrote more than 350 books about medicine. His teachings were promoted by the Church because they fitted with Christian ideology.

**Al Razi (Rhazes) and Ibn Sina (Avicenna):** Al-Razi and Ibn Sina (also known as Avicenna) wrote huge medical encyclopaedias which contained the work of ancient writers along with their own knowledge.

**Al-Zahrawi (Abulcasis):** 'Father of modern surgery'. Wrote Al Tasrif. Invented 26 new surgical tools and techniques including ligature use.



Source Type

Author

Date

Purpose



Source C: A medieval drawing of Galen dissecting a pig in the second century AD.

### Factors Question (16 marks + 4 SPaG)

**Factors:** War, Communication, Individual Genius, Religion, Government, Chance, Science and Technology

- 1) Was the preservation of the writings of the ancient Greeks and Romans the most important contribution that Islam made to medical progress?
- 2) Was religion the main factor in the development of ancient and Islamic medicine?

### Significance Question (8 marks)

- 1) Explain the significance of the work Hippocrates on the development of surgery.
- 2) Explain the significance of Islamic medicine on the development of medicine.

### Source Usefulness Question (8 marks)

- 1) How useful is Source C to a historian studying Galen's ideas about medicine and surgery?

### Comparison Question

- 1) Compare the work of Hippocrates and Galen. In what ways are they **similar**?
- 2) Compare the work of Galen and Abulcasis. In what ways are they **similar**?

# Key Events Timeline

**KEY:**

**Surgery**

**Public Health**

**Disease**

**Factors**



**War**



**Religion**



**Chance**



**Communication**



**Government**



**Science and Technology**



**Individual Genius**

## Channel Theory (3300 to 525 BC)

Having observed the damage done to farmers' fields when an irrigation channel became blocked, the Egyptians developed the idea that disease occurred when an evil spirit called the Wehedu **blocked** one of the body's 'channels'.



## Galen (130 AD - 210 AD)

Galen was a Roman doctor and surgeon. He had learnt his trade working with injured Roman gladiators. He took Hippocrates's findings on the four humours and built upon them. Human dissection was not allowed in Greek or Roman times as it was seen as an insult to the Gods but Galen had dissected wild animals. Indeed Galen is famous for his public dissection of a pig where he cut the pig's spinal cords to prove that movement and voice were controlled by the brain.

Galen's big idea was that every human being had their own unique mix of humours and that for perfect health all four humours had to be in perfect balance. It was believed that you only became ill once your humours went out of balance and if that happened then you had to rid yourself of the excess humour by sneezing and coughing to get rid of phlegm, vomiting to get rid of yellow or black bile or very seriously bloodletting with leeches/or opening veins to get rid of the excess blood humour. Galen also built on Hippocrates further when he introduced The Theory of Opposites. The theory was quite simple; if you showed evidence of one of the humours, then to recreate the balance, the treatment should be something that was directly opposite.



## First Islamic Hospital (805)

The first Islamic hospital was founded in Baghdad in 805 and by the **1100s** every large town had a hospital.

## Ibn Sina (Avicenna) (970–1037)

Ibn Sina (also known as Avicenna) wrote a huge medical encyclopedia known as the "Canon of Medicine". It collected the knowledge of ancient Greek and the Islamic world, and was used as the standard medical textbook for European doctors until the seventeenth century.



**1000 AD**

**500BC**

**0**

**(476AD) The Fall of Rome**

**500AD**

## Hippocrates (460 BC-370BC)

The ancient Greek doctor Hippocrates is considered the father of modern medicine. Others may have been interested in medicine before him but he was the very first to have his views on medicine written down and preserved. Hippocrates and other ancient Greeks believed in an idea known as the four humours. It was a simple idea; the human body was made up of four things; blood, phlegm, yellow bile and black bile.

Hippocrates created the fundamental principles of being a doctor:

Respect for human life has to come first and even above the law. A doctor must never harm a patient in any of their treatment.

Hippocrates's clinical observation is still followed today. Doctors started by studying symptoms; heartbeat, temperature, breathing and urine and take notes of the patient's answers. They would then study the notes and compare with previous patient's suffering from similar conditions to predict what may be wrong and possible treatment.

Finally Hippocrates believed that nature was the biggest cure. Lots of rest and sleep. Plenty of fresh air and exercise will also help as too will a good healthy diet of fresh meat and vegetables. Ironically this is still seen as good common sense today.



## Al-Razi (Rhazes) (865-925)

Rhazes was an Islamic Doctor who ran the Baghdad hospital, was the first author known to have written a book about children's diseases. He also explained the difference between smallpox and measles: this helped doctors diagnose the diseases.



## Al-Zahrawi (Albucasis) (936-1013)

Al-Zahrawi (Albucasis) wrote an encyclopedia called "al-Tasirif" including a volume called "On surgery", which was the first medical book to contain pictures of surgical tools, providing clear information on how they were to be used. His book also gave practical guidance. It was widely translated and used across Europe until modern times.



## KEY WORDS

- Apothecaries:** People who mixed herbal remedies and had good knowledge of the healing powers of plants.
- Astrology:** The study of the alignment of the planets and stars, used for diagnosing illness. Many people believed the Black Death was caused by a bad alignment of the planets.
- Barber surgeon:** Barbers worked with sharp knives and, as well as cutting hair, they often performed surgical procedures. Barbers would do surgery and not physicians.
- The Black Death:** An outbreak of the bubonic plague, spread by fleas on rats. Usually fatal within 3-5 days.
- The four humours:** The theory that ill health is caused by an imbalance of the four humours in the body. These are blood, phlegm (what is coughed up or sneezed out of the nose), black bile (excrement) and yellow bile (pus or vomit).
- Mass:** Roman Catholic service where bread and wine is given.
- Miasma:** Smells from decaying matter that were believed to cause disease.
- Phlebotomy or bloodletting:** A common treatment for imbalance of the humours. This was done by cutting a vein, using leeches or cupping (piercing the skin with a knife).
- Purging:** Inducing people to vomit or giving them a laxative to clear out their digestive system; used to balance out the humours.
- Regimen Sanitatis:** A set of instructions by physicians to help a patient maintain good health. This would have included bathing, not over-eating and taking moderate exercise.
- Supernatural cures:** Religious cures such as healing prayers, paying for a mass, fasting and going on pilgrimages.
- Urine charts:** Physicians would examine people's urine, checking colour, thickness, smell (and even taste) to diagnose illness.
- Trephination/Trepanning:** Cutting a hole in the skull to release evil spirits/pressure.
- Amputation:** Cutting off a limb.
- Cauterisation:** Burning a wound shut, often with a hot iron.
- Gongfermer:** A person who was hired to empty cesspits.
- Infirmary:** An area in a monastery where monks would care for the sick.
- Leprosy:** A disease which can cause damage to the skin and limbs.
- Bubo:** A swelling in the armpit or groin.
- Epidemic:** A widespread outbreak of one disease.
- Pneumonic:** Something which affects the lungs.

## Factors Question

**Factors:** War, Communication, Individual Genius, Religion, Government, Chance, Science and Technology

- 1) Was the wealth of the monastery the main factor in keeping monks healthy in Medieval England?

## Medicine stands still: Medieval

### KEY INDIVIDUALS

- De Chauliac:** Wrote Great Surgery. Criticised Theodoric of Lucca's ideas about pus. Ideas were influential.
- Frugardi:** Wrote The Practice of Surgery. Argued against trepanning.
- Theodoric of Lucca:** Disagreed with Galen's ideas about pus. Argued that it was not needed for a wound to heal. Used wine as an early antiseptic. Ideas not influential (due to criticising Galen and de Chauliac's book).
- John of Arderne:** Wrote Practica. Army surgeon during Hundred Years War. Used opium as an early anaesthetic. Created Guild of Surgeons, 1348.
- Mondino:** Wrote Anathomia (about anatomy) after a public dissection in Bologna.
- Roger Bacon:** Was an English Franciscan friar, philosopher, scientist and scholar of the 13th century who suggested that doctors should do their own research instead of accepting what Galen had said, church leaders put him in prison for heresy.

- Source Type
- Author
- Date
- Purpose



Source B: A medieval woodcut (c. 1480) showing two men performing flagellants on themselves during the Black Death.



### Significance Question (8 marks)

- 1) Explain the significance of the work of John Arderne on the development of medicine.
- 2) Explain the significance of the Black Death on Public Health.

### Comparison Question (8 marks)

- 1) Compare public health in a Medieval town with public health in a Medieval Monastery. In what ways are they different?

### Source Usefulness Question (8 marks)

- 1) How useful is Source B to a historian studying how people tried to treat or prevent themselves for getting the plague during the Black Death?

# Key Events Timeline

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**Religion**



**Chance**



**Communication**



**Government**



**Science and Technology**



**Individual Genius**

## Dealing with Pain

Some herbal anaesthetics, such as mandrake, opium and hemlock were used. However, dosages were difficult to get right, making their use dangerous. Usually the patient was held down and operations were performed as quickly as possible.

## Hugh and Theodoric of Lucca's (1267)

Father and son's book criticising encouraging the formation of pus in wounds was published.

## De Chauliac (1363)

His famous textbook '*Great Surgery*' dominated English and French surgical knowledge for 200 years.

## The Black Death in England (1348-1350)

The Black Death was an epidemic which killed 1.5 million people in Britain between 1348 and 1350. It is actually two diseases, the pneumonic plague and the bubonic plague.

### What people thought caused it:

People at the time were completely wrong about what caused the Black Death. Most of their explanations focused on supernatural causes. People thought causes included: The position of stars and the planets (astrology). Jews poisoning wells. God punishing people for their sins. Bad air (miasma)

## John of Arderne (1363)

Published his surgical manual '*Practica*' which contained illustrations of his operations and instruments. And in 1368 created the Guild of Surgeons within the city of London.

(1066)

**The Norman Invasion of Britain. (and an increase in the building of monasteries.)**

## Urine Charts (1250)

Doctors use urine charts, they believed the colour of urine and their pulse to determine patients illnesses.

1000

1200

1400

## Surgical Training

Barber surgeons were surgeons who learned through apprenticeships and who didn't go to university. Many surgeons gained experience on the battlefield as field surgeons.

1100

## Frugardi (1180)

Wrote a textbook on surgery called '*The Practice of Surgery*'.

## Dealing with Blood Loss

Most major wounds were closed using cauterisation which was extremely painful

## Eagle (1230)

'*Compendium Medicine*' is written by Gilbert Eagle – a comprehensive English medical textbook blending European and Arab knowledge of medicine.

1300

## Mondino (1316)

Mondino's dissection manual '*Anathomia*' was published.

## The Black Death in England (1348-1350)

### Individual people:

'Cures' for the Black Death were ineffective. They included: drinking mercury, self-flagellation (not popular in England), popping buboes, praying, avoiding sin, attacking Jews (not in Britain), fleeing to the countryside.

### Government:

Local councils tried to quarantine infected areas. King Edward III ordered church services and prayers every day where people would ask forgiveness from God. King Edward III tried to have streets in London cleaned to remove bad smells.

## Available Treatment

Trephination was sometimes used as a treatment for epilepsy. Most ordinary people avoided surgery as much as possible. Battlefield surgery usually involved amputation..

## The Church and Roger Bacon (1200's)

The Church was willing to take steps to silence people who challenged Galen: Roger Bacon was imprisoned in the 1200s for suggesting that doctors should do their own research.

(1250-1530)

Saw the growth of towns and cities in England as the population in England grew. Towns became overcrowded and disease spread quickly.

## The beginning of Change: Renaissance

### KEY WORDS

- Monastery:** A closed religious community where monks live.
- Field Surgeon:** A surgeon who works on the battlefield.
- Anatomy:** The knowledge of the body and how it works.
- Dissection:** Cutting up the body in order to find out or explain how it works.
- Anaesthetics:** Something which makes a patient unconscious or causes insensitivity to pain.
- Antiseptics:** Something which destroys germs.
- Investigative dissection:** Dissecting the body in order to make new discoveries, rather than to just prove Galen right.
- Realism:** A style of art, popular in the Renaissance, which tried to make art close to real life.
- Ligature:** A thread which is used to tie a blood vessel closed.
- Cauterisation:** Burning a wound in order to close it and stop blood loss. In the Renaissance this was done with a hot iron.
- Prosthetic limb:** A fake limb.
- Exile:** When a person is banned from a town or country.
- Mercury:** A metal which is poisonous to humans, often causing insanity and death.
- Syphilis:** A sexually transmitted disease which can cause painful rashes and sores.
- The scientific method:** A way of making discoveries where someone has an idea, tests it, and then comes to a conclusion based on the results, rather than personal opinion.
- Blood letting:** Removing blood from the body to balance the four humours.
- Epidemic:** A widespread outbreak of one disease.
- Pomander:** A ball, sometimes worn around the neck, which contained sweet smelling herbs.
- Miasma:** The belief that bad smells cause disease.
- Bills of Mortality:** Documents which show how many people died from which causes within a certain time period.
- Leeches:** A bloodsucking worm which was used to balance the four humours.
- Quarantine:** When people are isolated to make sure they can't spread diseases.

### KEY INDIVIDUALS

- Galen:** Physician in ancient Rome who developed Hippocrates' theories further (e.g. The Theory of Opposites) and wrote more than 350 books about medicine. Many of his ideas were disproved during the Renaissance.
- Vesalius:** The most famous anatomist of this period: disproved many of Galen's ideas and encouraged doctors to base their work on dissection rather than believing old books.
- Pare:** Battlefield surgeon who ran out of boiling oil so moved away from cauterization of wounds.
- Harvey:** Responsible for discovering the theory of circulation of blood around the body.
- Paracelsus:** Swiss scientist who rejected the Theory of the Four Humours and saw disease as something separate from the body, which needed to be attacked.
- Sydenham:** Known as 'The English Hippocrates'. Sydenham refused to rely on medical books when diagnosing a patient's illness and made a point of closely observing their symptoms and treating the disease causing them. Sydenham laid the foundation for a more scientific approach to medicine from the 18th century onwards.

- Source Type
- Author
- Date
- Purpose



**Source A:** The front cover of Vesalius' book 'The Fabric of the Human Body' published in 1543. It was published with high quality illustrations. Medical students used his book to teach them about the anatomy of the human body.

### Comparison Question (8 marks)

1) Compare Medieval autonomy with Renaissance anatomy. In what ways were they **different**?

### Source Usefulness Question (8 marks)

1) How useful is Source A to a historian studying the impact of Versailles on Medicine?

### Significance Question (8 marks)

1) Explain the significance of the work of William Harvey for the development of surgery.

### Factors Question (16 marks + 4 SPaG)

**Factors:** War, Communication, Individual Genius, Religion, Government, Chance, Science and Technology

1) Has the role of communication been the main factor in the development of medicine in Britain during the Renaissance period?

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Religion



Chance



Communication



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Science and Technology



Individual Genius

## Military technology

New military technology, such as gunpowder and canons meant that soldiers got new wounds. Field surgeons had to develop new techniques to treat them.



The Printing Press was invented (1440)



## Pare (1537)

Creates his antiseptic ointment of egg whites, turpentine and rose oil whilst on the battlefield.



## Harvey (1632)

Publishes his book 'On the motion of the heart in blood and animals', about the circulatory system.



## King Charles II (2<sup>nd</sup> – 6<sup>th</sup> February 1685)

The King fell ill from syphilis, he was given 58 drugs, and was purged, bled, blistered and cauterized. He still died as they didn't know how to treat him.



## The Great Plague ( June – November 1665)

The epidemic spread across London because of filthy conditions and fleas on rats. 100,000 Londoners died (1 in 5 people).  
Causes: Religion and the Supernatural (less believed than the Black Death), Punishment from God, Miasma, Cats, Jews



1400

## Columbus 'discovers' the New World ,the Americas (1429)

Explorers and voyages of discovery brought back new natural medicines.



## Realism in Art

Realism was a movement which tried to make art as realistic as possible. This allowed for the creation of accurate anatomical diagrams, allowing people to learn about the human body without as much dissection.



## Paracelsus (1538)

He is expelled from Basil for openly disagreeing with Galen and Sina and publically burning their books.



## Vesalius (1543)

Publishes his book 'On the Fabric of the Human Body' which explains his surgical discoveries that disprove some of Galen's theories.



1600

## The Great Plague ( June – November 1665)

Treatments : Theory of Transference, Lancing Buboës, Herbal Remedies, Blood-letting.  
Prevention:  
Physicians' advice: Pray, repent, quarantine family members, carry a pomander to drive away miasma, various diets and special costumes for plague doctors.  
Advice from other healers: Many people turned to local healers to help ward off the plague. Recipes for 'plague water' were popular, as were traditional herbal recipes.  
Government action: The government did more this time! They made people fast, banned public meetings and large funerals, closed theatres, killed cats and dogs, appointed searchers and wardens, stopped trade, had fires on street corners.



## Sydenham (1676)

Publishes his book 'Medical Observations', in which he criticised quack medicine and stressed the importance of observation of symptoms.



## The Reformation (1517 onward)

As many countries and people broke from the Catholic Church, people became willing to question traditional ideas and to experiment. The scientific method developed as people tested new ideas.



1700

## A revolution in medicine: 18<sup>th</sup> – 19<sup>th</sup> Century

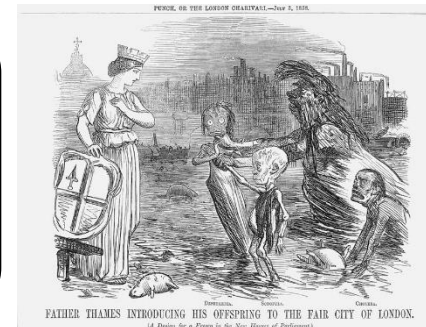
### KEY WORDS

- Philanthropist:** Someone who tries to improve the quality of life of other people.
- Dispensary:** A place which prepares and gives out medicines and remedies.
- Physician:** A doctor who trained at university.
- Inoculation:** Protecting someone from a disease by giving them a weakened version.
- Cowpox:** A disease, similar but less lethal than smallpox, which can be transmitted by cows.
- Laissez-faire:** This French term means 'leave be'. It is used to describe governments who do not get involved in the day-to-day lives of their population.
- Typhus:** A disease spread by lice on clothing.
- Miasma:** The belief that bad smells cause disease.
- Immune system:** The network of cells in the body which resists bacteria and disease.
- Act:** A law.
- Germ theory:** The correct theory that germs cause disease, rather than being the product of it.
- Cholera:** An infectious and often fatal bacterial disease typically contracted from infected water supplies.
- Spontaneous generation:** The belief that germs are the result of disease and decay, rather than the cause of them.
- Quarantine:** A state or period of isolation (designed to limit the spread of infection).
- Surgery's 'black period':** This was a period between the 1850s and 1870s where the number of people dying from surgery increased because surgeons were attempting more complex operations which carried a higher risk of infection and blood loss.
- Aseptic surgery:** Surgery where microbes are prevented from getting into a wound in the first place, as opposed to being killed off with an antiseptic.
- Cess pit:** A pit for storing sewage or waste.
- Microbes:** A microbe is any living organism that is too small to see without a microscope. Microbes include bacteria.
- Pasteurisation:** The process of heating liquids, such as milk, to kill off germs.

### KEY INDIVIDUALS

- Jenner:** 'The father of immunology'; Edward Jenner discovered the smallpox vaccination in 1796.
- Simpson:** Best known for discovering the effects of chloroform, he became the first person to be knighted for their services to medicine following the positive impact that regular use of anaesthetics had on surgery.
- Lister:** Joseph Lister used carbolic acid in surgery for the first time in 1865. His discovery was slow to catch on. It was not until the 1890s that new antiseptic methods were introduced to improve surgery on a widespread scale.
- Chadwick:** Edwin Chadwick published a Report on the Sanitary Conditions of the Labouring Classes in 1842; this was an important stepping stone in convincing the government to take action on Public Health.
- Snow:** In 1854, John Snow discovered the significance of the Broad Street pump in causing cholera. Snow's work, in combination with 'The Great Stink' of 1858 meant that the government took action and invested in new sewage systems.
- Nightingale:** Although not aware of Germ Theory, Nightingale is famous for revolutionising hygiene standards in hospitals during the Crimean War. In 1859, Notes on Nursing was published, allowing many other nurses to benefit.
- Pasteur:** In 1861, Louis Pasteur published Germ Theory. This proved that microbes in the air caused decay in substances such as wine and vinegar and changed people's conception of disease.
- Koch:** Following Pasteur's discovery, Robert Koch, a German scientist, began to look for specific microbes which caused disease. He identified lots of these, including the microbe that caused cholera.
- Bazalgette:** An engineering expert that planned and built the first sewers which could cope with London's waste.

Source C: An 1858 *Punch* cartoon depicting the Thames, as a source of terrible diseases for Londoners.



### Factors Question (16 marks + 4 SPaG)

**Factors:** War, Communication, Individual Genius, Religion, Government, Chance, Science and Technology

- 1) Was luck the main factor in the development of vaccines between 1880 and 1900?

### Comparison Question (8 marks)

- 1) Compare the work of Pasteur and Koch. In what ways are they different?

### Source Usefulness Question

- 1) How useful is Source C to a historian studying the spread of disease in the 19<sup>th</sup> century?

Source Type  
Author  
Date  
Purpose



### Significance Question (8 marks)

- 1) Explain the significance of Lister's work for the development of medicine.

# Key Events Timeline

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Science and Technology



Individual Genius

**Leeuwenhoek (1677)** Invents the microscope and discovers "animalcules".



**18th century AD:** Spontaneous generation becomes popular.

**(1724)** Guy's Hospital is founded in London.



**The Industrial Revolution (1750-1900)** Saw massive technological progress.



**Jenner (1798)** Develops vaccination as a protection against smallpox.



**Henle (1840)** Challenges spontaneous generation for the first time.



**Simpson (1847)** James Simpson, a Scottish obstetrician, was testing different substances and accidentally discovered chloroform.



**Clark (1842)** Used ether for a successful tooth extraction.



**Morton (1846)** Publically demonstrated the use of ether.



**Sanitary Act (1866)** Towns had to have a health inspector and were made responsible for sewers, water and street cleaning



**Lister (1867)** Publishes a description of carbolic antiseptic in surgery.

**2<sup>nd</sup> Public Health Act (1875)** Councils had to appoint a medical officer. They also had to provide clean water, cover sewers and keep them in good condition, collect rubbish and provide street lighting



**Artisans Dwellings Act (1875)** Councils had the power to buy and demolish slum housing.



1700

1750

1800

1850

1900

**The Industrial Revolution (1750-1900)** During the 19th century public health in towns and cities massively declined. Life expectancy in Britain was low: in **1840** the average life expectancy in Britain was 40! The industrial Revolution meant thousands of people migrated to cities and towns in search of work. This increase was so sudden that many towns and cities struggled to keep up and the existing public health facilities struggled to cope particularly as disease spread.

**Hunter (1728-93)** Wrote a number of different books about anatomy and disease. He demonstrated the importance of the scientific method when he infected himself with gonorrhoea to prove that it was a separate disease to syphilis! And experimented with ways to avoid surgery by diverting blood vessels.



**Bassi (1835)** Recognises a link between a specific bacteria and silkworm disease.



**Liston (1846)** A British surgeon, was influenced by Morton and used ether to perform a successful leg amputation.



**1<sup>st</sup> Public Health Act (1848)** Councils could set up a board of health but it was not compulsory.



**Snow and Cholera (1854)** A major outbreak of cholera occurred in Broad Street in London. The local doctor, John Snow, investigated the cause and proved that cholera was transmitted by water rather than by 'bad smells'



**Queen Victoria (1853)** was given chloroform during the birth of her son. She recommended it.



**Bazalgette (1848)** He begins building a network of sewers under London's streets. This was complete by the late 1860s.



**The Great Stink (1858)** A hot summer that caused the sewage in London to cause a horrible smell and forced the government to take action.



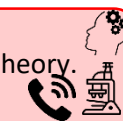
**Vaccination Act (1853)** Vaccination against smallpox was made compulsory.



**Sale of Food and Drugs Act (1875)** Guidelines were set up to check the quality of food and medicine before it was sold to the public.



**Pasteur (1861)** Publishes his paper on germ theory. This paper went on to inspire individuals, such as **Lister and Koch**.





## KEY WORDS

**Hereditary diseases:** Hereditary diseases are caused by genetic factors. This means that they can be passed on from parents to their children. Examples include Cystic Fibrosis and Huntingdon's disease.

**DNA:** Short for Deoxyribonucleic acid. DNA carries genetic information from one living thing to another. DNA information determines characteristics like hair and eye colour.

**Genome:** The complete set of DNA containing all the information needed to build a particular organism. In humans, this is more than three billion DNA pairs.

**Mastectomy:** Surgery during which a person has one or both of their breasts removed.

**MRSA:** A strain of drug resistant bacteria that is particularly resistant to antibiotics.

**NHS:** The Nation Health Service, set up in 1948, meant everybody had free health care for the first time. The development of democracy and WWII put pressure on the government to create it.

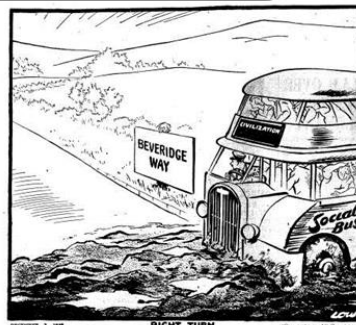
**Anaesthetic:** Drugs given to produce unconsciousness or limit pain before and during surgery.

**Dialysis:** A blood purifying treatment for people suffering from kidney failure.

## Factors Question (16 marks + 4 SPaG)

**Factors:** War, Communication, Individual Genius, Religion, Government, Chance, Science and Technology

- 1) Has science been the main factor in the development of penicillin?
- 2) Has war been the main factor leading to the improvements in surgery?
- 3) Have governments been the main factor in the development of public health?



**Source A:** A cartoon published in the Evening standard December 1949. It's called "The Right Turn".

## Source Usefulness Question (8 marks)

- 1) How useful is Source A to a historian studying the Beveridge Report and the NHS?

Source Type

Author

Date

Purpose



## Modern medicine: 20<sup>th</sup> Century

### KEY INDIVIDUALS

**Bevan:** Aneurin Bevan was the Minister of Health who was responsible for setting up the NHS in 1948.

**Beveridge:** Sir William Beveridge was the civil servant who published The Beveridge Report in 1942. It recommended setting up a National Health Service, free to everyone and paid for through taxes. Over 600,000 copies were sold – people queued outside shops to buy a copy!

**Crick and Watson:** James Watson (an American biologist) and Francis Crick (an English physicist) discovered the structure of DNA in 1953. This was crucial in allowing scientists to identify the different causes of hereditary disease. Later, in 1990, James Watson led the Human Genome Project.

**Fleming:** Alexander Fleming was a British doctor who, in 1928, accidentally identified penicillin. He did not publish his findings, but was awarded the Nobel Prize in Medicine in 1945 for this discovery.

**Florey and Chain:** Howard Florey and Ernst Chain were the first scientists to extract penicillin and prove that it was effective at fighting infection in the human body. The first human patient was given penicillin in 1941; a policeman who had been scratched by a thorn and developed septicaemia.

**Landsteiner:** In 1901, Karl Landsteiner discovered blood groups, which meant that successful blood transfusions were possible for the first time. When they'd attempted this before, blood had simply clotted.

**Lloyd George:** David Lloyd George was the Prime Minister who carried out the social reforms in the 1900's.

**Mendel:** Gregor Mendel was a German scientist who theorised that genes come in pairs, with one being inherited from each parent. This was known as the fundamental laws of inheritance, and although he could not prove his theory because microscopes were not powerful enough, he was crucial in paving the way for Crick and Watson.

## Comparison Question (8 marks)

- 1) Compare the work of Edward Jenner with the work of Florey and Chain. In what ways was their work similar?
- 2) Compare Pasteur and Fleming. In what ways are they similar?

## Significance Question (8 marks)

- 1) Explain the significance of Liberal social reforms for the prevention of disease.
- 2) Explain the significance of Crick and Watson's discovery of DNA?

# Key Events Timeline

**KEY:**

Surgery

Public Health

Disease

**Factors**



War



Religion



Chance



Communication



Government



Science and Technology



Individual Genius

**Gregor Mendel (1900)**

Theorised that genes come in pairs, but could not prove his laws correct because microscopes were not yet powerful enough.



**Plastic Surgery WW1**

The British surgeon, Harold Gillies learnt to graft skin for plastic surgery.



**The 1<sup>st</sup> Magic Bullets (1909)**

Paul Erlich found Salvarsan 606



(1980)

The WHO (World Health Organisation) declares smallpox eradicated.



**Florey and Chain (1940's)**

During World War Two, Florey and Chain learned how to mass-produce the penicillin they had discovered - the first antibiotic.



**Franklin and Wilkins (1951)**

Scientists working in 1951 who knew that characteristics are passed from parents to children, however technology to X-ray photograph DNA only became possible in 1953.



**1<sup>st</sup> Test Tube Baby (1978)**

Louise Brown was the first 'Test Tube' baby to be born.



**Treatment of breast cancer (2000)**

Using research from the Human Genome project, scientists were able to identify a gene in some women who are extremely likely to develop breast cancer (BRCA1 gene).



1900

1920

1940

1960

1980

2000

1910

1930

1950

1970

1990

2010

**The Liberal Reforms**

The Boer War (1889) and Roundtree's poverty line made people aware of the poor's living conditions and health. So the Liberal government tried to create laws to help.  
**1906** -Local authorities were given the right to provide free school meals for poor children  
**1907** -The School Medical Service gave free health checks  
**1908** - The government introduced pensions for old people  
**1911** -The National Insurance Act provided free medical treatment for workers, and benefit money for those out of work



**The NHS (1948)**

The Labour Health Minister Aneurin Bevan set up the National Health Service – free doctors and hospitals, paid for out of taxes because of the Beveridge report in **1942**.



**Alexander Fleming (1928)**

Discovered penicillin.



**The 2<sup>nd</sup> Magic Bullets (1932)**

Domaght Gerhard found Prontosil



**Crick and Watson (1953)**

Scientists who saw X-ray photos taken by Franklin and Wilkins and from this, built their model of DNA. They were the first to realise that DNA was the shape of a double helix.



**Plastic Surgery (WW2)**

The British surgeon, Archibald McIndoe, did the first plastic surgery on the faces of disfigured airmen.



**The Human Genome Project (1990)**

Originally led by James Watson, this was a project to map the human genome. Eighteen scientists worked for a decade to map the first draft.



Tobacco advertising banned (**2005**)

Smoking Ban in Public places (**2007**)

No smoking in cars with children (**2015**)

Sugar Tax – Higher tax for sugary fizzy drinks (**2018**)

