Health and the People

Revision booklet

The big picture

Time Period	PREHISTORY	EGYPT	GREECE	ROME
DATES	10,000BC-3000BC	3000BC – 1500BC	1000BC-250BC	300BC-C.AD500
DISEASE + INFECTION WHAT caused disease?	Gods and spirits	Blocked channels (think of the Nile!)	Imbalance of the 4 humours Astrology/movement of the planets	
WHO healed it?	Medicine men, wise women	Specially trained priests Specialist doctors	Asclepius	
HOW did they treat it?	Herbal remedies, prayers and charms	Purging	Bleeding, purging, rest, exercise, diet	
SURGERY + ANATOMY WHAT, if any, surgery was performed?	Simple surgery – setting bones/trepanning		Honey, wine and vinegar used as antiseptics Some simple anaesthetics made from plants	
HOW MUCH did they know about the body and anatomy?	Very basic – knowledge of main bones and some organs			Galen thought dissection was important, but was only allowed to dissect animals. He therefore made a lot of discoveries that were not correct in relation to humans
PUBLIC HEALTH Was anything done to improve the health of the general population?	Individuals took care of themselves		The Greeks had some knowledge of hygiene but did not understand why it helped you stay healthy	Romans built public health facilities – baths, toilets, sewers and aqueducts
WHO were the key people in each time?		Imhotep	Hippocrates	Galen

Time Period	MIDDLE AGES	RENAISSANCE	1800s	1900s – PRESENT DAY
DATES	AD1000 – AD1400	AD1400 – AD1600	1800-99	1900 - NOW
DISEASE + INFECTION WHAT caused disease?	Gods and Spirits Imbalance of 4 humours Miasma/bad air	A lot of people still believed in the theory of the 4 humours and that bad air caused disease	Germ Theory: Scientific advances led to the correct understanding of ... GERMS! Spontaneous generation	Genetic causes - DNA
WHO healed it?	A lot of people up until the end of the renaissance would rely on priests or family members to help them recover from an illness, rather than see a doctor or go to a hospital		Fully trained doctors and nurses, improved hospitals	
HOW did they treat it?	Herbal remedies Leeches Bleeding, exercise and diet	More herbs available for herbal remedies	Vaccination discovered as a method for preventing disease	Chemical drugs, antibiotics, genetic medicine
SURGERY + ANATOMY WHAT, if any, surgery was performed?	Battlefield surgeons made minor improvements Use of cauterisation to stop bleeding	Improved treatment of gunshot wounds Use of ligatures to stop bleeding	Chloroform – effective anaesthetic Carbolic acid – effective antiseptic	Discovery of blood groups – transfusions
HOW MUCH did they know about the body and anatomy?	Galen	Vesalius pioneered human dissection and proved Galen's theories wrong Harvey discovered how blood circulated around the body	Use of microscope to develop knowledge	X-rays Discovery of DNA
PUBLIC HEALTH Was anything done to improve the health of the general pop?	Monasteries developed their own public health systems after the Romans left, but kings and mayors did little to help		Governments became increasingly more involved in improving public health Cholera epidemics forced govt to act	Help for poor, sick and unemployed NHS – 1948
WHO were the key people in each time?	Al-Razi Ibn Sina	Vesalius Paré Harvey Paracelsus	Jenner Simpson Snow Nightingale Chadwick Pasteur Koch Lister Blackwell Anderson Seacole Hill	Booth and Rowntree Lloyd George McIndoe Beveridge and Bevan Fleming, Florey and Chain Crick and Watson

Question 1

- 8 marks = 12 mins
- 2-3 references to source needed.
- Provenance can be one
- OK needed.

- This source is useful as in the source I can see.. This suggests that….
- From my own knowledge I know that…..(does your OK support the message of the source?)

Question 2

- 8 marks = 12 mins
- 2-3 examples needed.
- Think impact both short term and long term.

- If it's an individual then describe 3 things they have done and the impact this has had.

- If its an event, give 2-3 examples of the impact it has had.

Question 3

- 8 marks = 12 mins
- 2-3 similarities needed.

- NOT DIFFERENCES!!!

- Make sure you mention both aspects from the question.

Question 4

- 16 marks = 25
- 4 spag
- Easiest question but longest.
- Factors- War/Religion/ Science and Tech/ governments/ Luck and Individual genius.

- Key to this question- read the question carefully- look to see if its public health/ development of medicine./ causes of disease
- Select different people for different factors and across the time periods.

Disease and Infection

Greeks

Asclepion medicine

- Ancient Greek civilisation developed around the city of Athens from 1000BC to 300BC
- Built on Egyptian ideas
- Greeks famous for their love of philosophy but they did believe in the gods
- Asclepius, the son of Apollo, was their chief god of healing. Temples were built dedicated to him.
- Asclepius was believed to possess the power to heal patients if they visited temples and made offerings
- Helped by his 2 daughters; Hygeia and Panacea who would visit them in the Abaton (where patients slept) and cure them.
- Asclepius was accompanied by a snake which would lick the area
- Priests gave medicines
- Patients took exercise, bathed and ate a regular diet.
- Carved stones were left by patients out of gratitude
- Asclepion medicine carried on during Hippocratic medicine because the Greeks respected their gods.

Hippocratic medicine

- Hippocrates was a Greek philosopher 460BC to 377BC known as the 'father of medicine'
- Created the Hippocratic collection (books which passed on his ideas to later generations)
- Theory of the four humours based on the ideas of greek philosophers like Thales, Anaximander, Pythagoras and Aristotle
- Everything made from 4 elements – earth, air, water and fire.
- Applied to the human body – blood, phlegm, yellow bile and black bile.
- An imbalance caused illness
- Clinical observations – doctor had to study his patients carefully 'Observation, Diagnosis, Prognosis and Treatment'
- Hippocrates rejected the ideas of gods or magic
- Using clinical observation the doctor tried to bring the four humours back into balance eg bleeding or purging.
- The Hippocratic Oath – doctors promised to give their best treatment not to harm the patient and keep everything confidential.

People Dates Key points

Disease and Infection

Medieval and Renaissance

Roman Empire collapsed and Europe was split into warring tribes with no interest in education or science. **Christianity** and Islam preserved the medical writings.

- Christians often believed that illness was a punishment from God despite the fact that Hippocrates had suggested natural explanations.
- In the twelfth century Saint Bernard said, 'To buy drugs or consult with physicians doesn't fit with religion.'
- During the Black Death (1347-49) many people said God was punishing sinners. Mentally ill patients were thought to be possessed by demons and often flogged to drive out the evil spirits.

Treated the sick by setting up hospitals – some were small with space for 12 patients but some larger. They did not have doctors but chaplains

- Monasteries and convents would have their own infirmaries for the care of the sick. They offered care and rest over curing people. Prayer was the best medicine.
- Many monasteries also had their own herb gardens for the preparation of medicinal drugs.

Christian Church was the most powerful organisation in Europe. It was very traditional. For example dissection to discover new knowledge was banned by the Pope.

The Church taught that important knowledge came from ancient books such as those of Hippocrates or the Bible. Scholars worked to clarify not discover.

1200 doctors were trained under Church approved universities. Galen's works taught here. If people questioned Galen they may be imprisoned like Roger Bacon.

+ Cared for the sick

+ Preserved the work of Hippocrates and Galen.

People Dates Key points

Disease and Infection

Medieval and Renaissance

Muslim doctors and scholars added to the knowledge of the Ancient Greeks

Roman Empire collapse brought wars but the Byzantine Empire in the East survived with a peaceful and stable government.

In the 7th century the Prophet Muhammad's followers established an enormous and new empire in the Arab world. Islam's golden age of scholarship was from 750AD to 1050AD

Islamic doctors included

Ibn Sina (Avicenna) – 'Galen of Islam', compiled a summary of all medical knowledge called 'The Canon of Medicine', chapters on eating disorders and obesity, The Canon was used as a standard text in European schools and Universities

Al-Razi – 'Rhazes' wrote 200 medical books, identified the symptoms and developments of smallpox, he also wrote *Doubts about Galen*

The first Islamic hospital was built in Baghdad in 805AD and by the 12th century every major town had one.

- These unlike the Christian versions were more concerned with the treatment of patients
- There were teaching hospitals that focussed on teaching doctors and nurses, the one in Baghdad had its own library
- Some hospitals were specialised eg mental illness

Contribution to medical progress

- Government supported doctors in their search for knowledge.
- The Caliph ran the whole Islamic Empire. Caliph Harun al-Rachid (786AD-809) created a centre for the translation of Greek manuscripts into Arabic.
- Muslims were encouraged by the Prophet Muhammad himself to 'seek learning even as far as China'. Prophet Muhammad also encouraged a scientific approach; 'For every disease, Allah has given a cure'
- Hippocrates and Galen's works were translated
- Islamic medicine improved the drugs and medicines provided with 'alchemists' finding new chemicals.

+ Preserved the work of Galen and Hippocrates

+ Treating the sick in hospitals

+ Al-Razi and Ibn Sina added to the knowledge of Hippocrates and Galen

+ Development of new drugs and medicines.

People Dates Key points

Disease and Infection

1800s

Smallpox was a very infectious disease that killed 25% of those that caught it. Could be left blind if you survived.

- People often isolated – left to die or survive!
- In the Middle Ages they tried inoculation (giving a healthy person pus or scabs from an ill person. Giving a person a mild dose of the disease would build up resistance in the body.
- Inoculation became very popular in Britain – doctors became very wealthy!
- Inoculation was risky however and some people caught smallpox and died. The risks of inoculation were less than smallpox though!

Edward Jenner made a huge discovery.

He noticed that milkmaids who caught cowpox (a non-fatal version) from their cows did not catch smallpox. In 1796 he took pus from a cowpox scab on a girl named Sarah Nelmes and placed it into 2 small cuts on the arm of an 8 year old boy, James Phipps. 6 weeks later he did the same with smallpox but Phipps showed no reaction. The cowpox had prevented him from catching smallpox.

Opposition:

- Doctors carrying out inoculation were against it because they would lose money.
- Religious people said smallpox was a punishment from God and it was wrong to interfere with God's plan
- People feared that being vaccinated might turn them into cows
- Most doubted that a country doctor like Jenner could make such an important discovery
- Jenner could not explain why it worked.

In 1853 the government made vaccination against smallpox compulsory for children.

Jenner 'father of immunology'

2 other people had used cowpox to prevent smallpox before but Jenner's impact was because he proved his theories using scientific methods and experiments.

- Carefully recorded his work on Phipps
- 1799 he carried out a national survey to prove his findings.

People Dates Key points

Disease and Infection

1800s

Before Louis Pasteur people still believed that sickness was a punishment from God or caused by miasma. But the invention of the microscope (1590s) meant that scientists now knew that germs existed.

The new theory was called 'spontaneous generation' which meant that germs or bacteria were created when things rotted or decayed. Scientists had it the wrong way around!

Achievements:

•Shown that germs caused an animal disease in silkworms

•Many doctors and scientists accepted his ideas. For example Joseph Lister was so impressed he began to use antiseptics to kill germs during his operations.

Limitations:

•Despite public experiments other doctors refused to believe his ideas

•Pasteur had not been able to identify a germ that caused human disease.

•In 1868 Pasteur was forced to give up his work because of a stroke.

Pasteur's discovery:

1857 Pasteur was asked by local wine growers to investigate why wine often became sour. Using a microscope, Pasteur discovered that it was germs that caused the wine to go off. Further experiments showed:

- Germs made other liquids like milk go sour
- The souring was caused by germs in the air
- These germs could be killed by heating the liquid – a process called 'pasteurisation'.

Many scientists refused to believe him. So he designed an experiment with a swan-necked flask to prove that germs in the air caused decay. He carried this out in public many times.

The next step was to show that germs could cause disease in animals and humans.

In 1865 while working in the silk industry, Pasteur proved that the disease which was killing silkworms was caused by germs. The link between germs and animal disease was made!

People Dates Key points

Disease and Infection

1800s

Robert Koch (German) had a fierce rivalry with Pasteur (French).

So he employed a highly skilled team of researchers to help him.

Koch's methods made it easier to study germs by:

- Using new industrial dyes to stain individual germs so that they could be seen.
- Devising a way to grow a group of the same germs
- Developing a was of photographing germs to share information.

His achievements after 1872:

- able to identify the germ that caused tuberculosis
- Other scientists began using Koch's methods and soon the germs causing typhoid, diphtheria and pneumonia.

Louis Pasteur (again!)

In 1877 he had recovered from his stroke, driven by personal rivalry but chance played a big part in his next discovery!

He found weakened germs would protect chickens from strong germs by mistake.

Achievements:

Shown how vaccinations worked – weakened germs built up the body's defences.

Developed a vaccine against the deadly animal disease anthrax.

Early 1880s developed a vaccine for the deadly human disease of rabies. (Would not test it on a human until a small boy who had already been bitten came in. He survived.

Other scientists used Pasteur's methods to develop vaccines for diphtheria and tuberculosis.

People Dates Key points

Disease and Infection

1900s

Important discoveries thanks to Jenner, Pasteur and Koch:
1909 – Paul Ehrlich found a chemical cure for syphilis. Ehrlich described it as a 'magic bullet' because it went straight to the harmful germ and destroyed it but without harming the rest of the body.

1. 1928 Alexander Fleming discovered penicillin

He had seen firsthand how soldiers in WW1 died, not from wounds but from simple infections caused by germs getting into those wounds. (**factor = war)**

While tidying his laboratory he made an accidental discovery. Fleming saw a mysterious mould growing in one of his old culture dishes that seemed to have killed all the harmful bacteria around it (**factor = chance)**

He realised that the mould should be studied and found it was penicillin, the properties had been known for over 100 years. (**factor = personal qualities)**

He had to turn it into a pure drug to be effective. Unable to do this.

2. 1938-41 Producing pure penicillin.

Howard Florey working with Ernst Chain decided to see if they could produce and experiment with pure penicillin (**factor – science**)

By 1940 they had produced small amounts – tested successfully on mice. October 1940 tried on a human. It was working on a policeman but they ran out of the drug (**factor – science**)

WW2 meant big companies could not provide resources to produce the drug (**factor – govt and industry)**

3. 1941-44 Mass production

1941 Florey flew to America to ask for research funds but US about to enter WW2 (**factor – war**)

The US govt saw potential of using penicillin to treat wounded soldiers. Gave $80 million. (**factor – govt)**

US govt made companies share research data

By 1944 it was being mass produced and used on D-Day. After the war penicillin being used for civilian use and became known as an antibiotic.

People Dates Key points

Disease and Infection

1900s

Difficulties for women:

- Middle Ages; the Christian Church only allowed men to train as physicians. Women were feared to be witches.
- Women could not go to university so could not be surgeons.
- 1700s it became popular for men to train as midwives.
- 1852 – Medical Registration Act. Had to be a member of one of the Colleges of Physicians, Surgeons or Apothecaries (all closed to women)
- Society considered a woman's role as a mother.

Situation in 1800

- Filthy, cramped and stuffy hospitals with inadequate toilets encouraged infections to spread.
- Most of the nurses who worked in them were untrained. They were often criticised for being dirty or drunk!

Improvements in the 1860s

- Situation steadily improved.
- Florence Nightingale improved basic hygiene in the military hospital during the Crimean War and saved lives. She used her fame to raise money and awareness to set up proper training courses for nurses.

Elizabeth Blackwell: Qualified as a doctor in America. In 1849 she returned to England. She was the only woman on the official list of doctors. Encouraged and inspired other women to become doctors.

Elizabeth Garrett Anderson: No University medical school would accept her. Tutored privately and worked as a nurse at Middlesex University. In 1865 she passed the Apothecaries exam and received her license to dispense medicines. She went to the University of Paris and gained her degree in 1869 but would not be accepted in Britain because it was french!

Florence Nightingale: Born in 1820 to a wealthy family. Trained as a nurse in Germany and ran a hospital for rich women in London. In 1854 nightingale was asked to take control of a military hospital in Scutari (Crimean War). She took 38 nurses. When they arrived they thoroughly cleaned the hospital and improved the death rate (40% to 2%). When she returned in 1856 she set about improving hospitals in Britain. 1860 set up the Nightingale Training School for nurses at St Thomas' Hospital in London. She published *Notes on Nursing* which was a bestseller. Known famously as 'the Lady with the Lamp'

Mary Seacole: born in Jamaica she was a skilled healer and midwife. She paid for her own journey to the Crimea. She set up a hotel near Balaclava to give food and drinks to soldiers. Also treated men on the battlefield. After the war she was in ill health and no money so had little impact back in Britain.

People Dates Key points

Disease and Infection

1900s

Challenges in 21st century

- New Diseases – AIDS the 4th biggest killer worldwide and, at present, there is no effective cure or vaccine.
- 'Superbugs' – Bacteria such as MRSA – difficult to kill as resistant to normal antibiotics. They thrive in hospitals and nursing homes
- 'Old' diseases returning – number of people in Britain catching diseases like mumps, tuberculosis and malaria even though there are vaccines is growing. Due to vaccination campaigns not being effective or because of more foreign travel.
- The cost of medical progress and care – new drugs and medical technology are very expensive. Ageing population means more money needed for social and medical care for this age group. Alzheimers is a problem.
- Illnesses caused by lifestyle choices – these give health services the dilemma as to whether scarce resources should be given to people who choose to smoke, eat unhealthily or abuse drugs and alcohol.

Alternative therapies – aromatherapy or homeopathy - alternatives to drug based scientific methods and become increasingly popular with supporters, claiming that they are more effective than conventional treatments.

Opportunities in 21st century

- DNA research – DNA contains the instructions that operate every cell in the body. The double helix shape of the DNA was discovered by Francis Crick and James Watson in 1953. Between 1986 and 2001 the Human Genome Project identified the purpose of every gene in the body. Further research could lead to; gene therapy, genetic screening, customised drugs and 'designer babies'
- International co-operation through the World Health Organisation - led to the eradication of smallpox by 1980. WHO is also now working on combating AIDS/HIV and tuberculosis worldwide.

People Dates Key points

Surgery and Anatomy

Greeks

Greek doctors were more concerned with the causes of disease and sickness and in treatments based on Hippocrates' theory of the 4 humours. But they did set bones and also for example they knew you could treat pneumonia by draining the lungs.

In 330BC Alexander the Great conquered Egypt and named the capital after himself; 'Alexandria'. Here he built a great university and library where books from China and India were collected. Hippocrates and Aristotle's books were also here.

Gradually it developed into a medical school where dissection of human corpses was allowed. Led to the following discoveries;

300BC Herophilus discovered that the brain controlled the movements of the body.

Later Erasistratus dissected human brains saying that the brain sends messages to the body through the nerves.

Erasistratus also dissected human hearts and speculated the heart was a pump (later proven by Harvey)

People Dates Key points

Surgery and Anatomy

Romans

Galen very important as he argued that doctors should learn as much as possible about the body's workings and structure. He recommended dissections but they were banned due to religious reasons. So turned to animals instead.

At a dissection of a live pig Galen showed how different nerves controlled movement and vocal cords.

He proved that the brain, not the heart, controlled speech.

He did however make mistakes e.g.

Human kidneys were arranged one on top of the other.

the heart works as a machine, the blood the fuel.

blood supply could be replenished by eating red meat and drinking wine.

Galen's impact:

Wrote several hundred medical books; these contained works of previous doctors like Hippocrates and his own on diagnosis, treatment and surgery. Galen's books look like a complete encyclopaedia of medical knowledge and this was the reason why Galen became the supreme authority on medical matters for centuries.

Galen's ideas also fitted nicely with the ideas of the Christian Church. Probably why he was unchallenged for 1500 years. During the Middle Ages the Church controlled education. Galen was not Christian but he did believe that that the human body was a work of perfection created by one god. To question Galen was therefore seen as blasphemous as it fitted with the Christian idea.

Theory of Opposites
Public demonstrations
350 books

People

Dates

Key points

Surgery and Anatomy

Medieval

Experience: medieval surgeons learned from experience by watching other surgeons

War: In wartime surgeons learned how to deal with different battlefields wounds. They were confident in dealing with these kinds of injuries but they did not perform complex, internal surgery.

Books: the 1st European book on surgery was written by Roger of Salerno in the late 12th century. In the 14th century Guy de Chauliac wrote a book called *Great Surgery*. These books contained hand-drawn illustrations of techniques such as cauterising.

Progress?

13th century Hugh of Lucca and his son Thoedroic (Italian surgeons) found that wine made a better job of cleaning a wound than water. But they did not know why!

14th century John of Arderne experimented with henbane and hemlock as anaesthetics. In controlled doses it worked but too much would kill the patient.

From 1340 an annual human dissection was performed at Montpeilier University in France.

There was also professors of surgery introduced which raised the status of medieval surgeons who had been looked down upon before.

Cauterising – using a red-hot iron to seal blood vessels.

People

Dates

Key points

Surgery and Anatomy

Renaissance

What happened?

- Classical knowledge of Rome and Greece rediscovered.
- They had a love of learning, experimenting and new discoveries; enquiry rather than acceptance!
- Church lost some of its powers; people began to ask questions
- Printing press invented (quicker communication of knowledge)
- Important developments in science and technology eg watches and pumps
- Developments in Art (Leonardo da Vinci) more lifelike drawings
- Humanist ideas developed – new belief and interest in the potential and achievements of mankind

Ambroise Paré (1510-90)

Before Paré surgery was brutal (burning oil poured into wounds!)

Contribution

- Treated wounds with soothing ointment of egg yolks, turpentine and rose oil for cauterising wounds
- Used silk threads called ligatures to stop bleeding
- Designed prosthetic limbs for wounded soldiers.

Situation after

- Using ligatures was slow so many surgeons on the battlefield carried on cauterising
- If the silk threads were dirty they could increase infection.
- He had no formal education so he was looked down upon by others
- The problems of pain and infection remained unsolved for 300 years.

Paré was a French barber surgeon

Worked in the French army and for the royalty

Wrote the book *Works on Surgery* in 1575

People Dates Key points

Surgery and Anatomy

Renaissance

Andreas Vesalius (1514 – 64)

Galen had been unquestioned for 1500 years.

Contribution

- First anatomical textbook
- He proved Galen wrong e.g. Jawbone was one part, not two AND that human kidneys were not located one on top of the other.

Situation after

- Impact was limited because many doctors refused to accept Galen was wrong
- Vesalius' work did not cure anyone and had no practical uses.

Vesalius came from an Italian medical family

He studied in France and Italy and was a professor of surgery at Padua University

Wrote *The Fabric of the Human Body* in 1543

William Harvey (1578 – 1657)

Galen said the heart was a machine

Contribution

- Harvey dissected animals and humans, performed experiments and kept detailed notes
- Proved that the heart pumps blood in 1 direction around the body
- Showed that blood passes through the heart via the septum and that the arteries take blood away from the heart and the veins bring blood back in

Situation after

- Limited impact because doctors refused to accept these ideas
- His account of blood movement was limited as he could not explain how blood moved between the arteries and veins (capillaries – which were discovered in the 17th century with the microscope)
- Harvey's work had limited practical value at the time. Did not help people to get better till blood groups discovered.

Harvey was an Englishman who studied at Cambridge and Padua

He was physician to Charles II

Specialist in blood circulation

People Dates Key points

Surgery and Anatomy

1800s

Before – no anaesthetics, no hope in reducing pain, no attempt to control infection, no knowledge of germs, no way to replace blood.

No anaesthetics meant that operations had to be done as quickly as possible and only on the surface of the body.

Humphrey Davy did experiments to discover the property of gases. He experimented and found that nitrous oxide was a natural painkiller. He called it 'laughing gas'. He said he could see it being used in surgical operations. 40 years later some surgeons used it successfully for the first time.

Doctors now looked for other gases with similar qualities. The 2nd gas was ether. Demonstrated successfully by John Warren in Boston in 1846 but was flammable, unpleasant and irritated the lungs.

Breakthrough in 1847 when the Scottish doctor James Simpson discovered the effectiveness of Chloroform.

- Opposition to anaesthetics

Religious groups felt that pain, particularly in childbirth, was sent by God and should therefore be suffered.

Doctors and dentists were worried about the correct dose of chloroform because they did not realise that men, women and children needed different quantities, and as a result some patients had died.

Some doctors felt that anaesthetics made little difference to the outcome of the operation.

Most of the initial opposition to anaesthetics disappeared after Queen Victoria chose to give birth to her son in 1853 under anaesthetic!

Anaesthetics– a substance that removes pain.

People Dates Key points

Surgery and Anatomy

1800s

Problem of infection: surgeons would use dirty, unsterilised equipment. Many patients died after surgery from infected wounds.

Ignaz Semmelweis:

First doctor to stop infection. He was Hungarian, working in Vienna in the 1840s. Horrified that so many women died after childbirth from puerperal fever.

Semmelweis believed that doctors who had first examined corpses and then pregnant women were spreading the disease on their unwashed hands.

He cut the death rate by ordering doctors to wash their hands in a solution of chloride of lime, an effective antiseptic which killed the bacteria.

Although Semmelweis was correct he could not prove it because Pasteur's germ theory was another 20 years in the future. His ideas were dropped when he left Vienna in 1848. Death rates rose again!

Joseph Lister

1867 he read through Pasteur's work he developed the use of carbolic acid to kill germs. He soaked his instruments in it and used a carbolic spray to kill germs in the operating theatre.

Lister cut the death rate from 46% to 15% in 3 years. He promoted the idea of sterile surgery.

Opposition

Some doctors thought the sign of a skilled surgeon was the speed with which he worked.

Carbolic acid was unpleasant to use. Dried out doctors skin , made their eyes water and irritated the throat.

Many doctors still refused to accept Pasteur's germ theory and therefore thought them unnecessary.

Aseptic surgery – stop germs getting into the operating theatre.

Professors Neuber and Bergman insisted that all surgeons clothes, hands and instruments were sterilised before use.

The American William Halstead developed rubber gloves for all doctors and nurses to avoid the spread of germs.

People Dates Key points

Surgery and Anatomy

1900s

The discovery of blood groups in 1900

During surgery the body can lose a lot of blood, and patients can die from losing too much blood even if the surgery is successful.

Blood transfusions were tried in the 19th century. They often failed because a patient's body would reject blood from a different blood group, and usually died from a reaction to it.

In 1901 a German doctor, Karl Landsteiner discovered blood groups.

However there was no method of storing blood. The donor had to be in the same room as the patient. The replacement of a patient's blood could not be anticipated and prepared for; this came later with the use of sodium citrate to stop blood clotting.

By 1920 surgeons were able to overcome the main problems they had faced in 1800.

- Effective anaesthetics meant they could take time and care over operations.
- Carry out procedures inside the body too.
- Keep patients safe from infection.

- How did war help surgery develop?

WW1 soldiers needed blood transfusions. British doctors discovered sodium citrate would stop blood from clotting.

Gunshot wounds carried dirt deeply into the wound. Surgeons had to cut away infected tissue.

WW1 needed X-rays developing to help surgeons locate bullets and shrapnel. Governments ordered more of William Rontgen's X ray machines including portable versions.

Development of penicillin during WW2

Plastic surgery and skin grafting was pioneered by New Zealand surgeon, Sir Harold Gillies. End of WW1 surgeons carried out 11,000 skin grafts.

Afghanistan war (2001) has produced many injuries that have led to new medical techniques to rebuild limbs shattered by explosions and advances in replacement limbs.

Wars are disruptive and cause governments to reassess priorities.

People Dates Key points

Surgery and Anatomy

1900s

- How did science and technology help surgery to develop?

William Rontgen discovered X-rays in 1895. Could see inside a patient without cutting them open.

Marie and Pierre Curie in the 1890s noticed that their hands were being burnt by the material they were handling when working with X-rays. This was the beginning of modern cancer diagnosis, treatment and radiotherapy.

Helmuth Wesse in the 1930s pioneered the use of anaesthetics injected into the veins.

Tissue typing was first used in 1962 to help match a kidney to a patient to reduce the risk of infection and rejection. Cyclosporine (drug to stop the body rejecting (1980s))

Kidney transplant (1954) and liver transplants (1963). Christiaan Barnard performed the first heart transplant in South Africa in 1967.

Micro-surgery in the 1980s.

Keyhole surgery developed since 1990s. Can insert small cameras

Modern surgery – what problems remain?

Relatively little is still known about how the brain controls the functions of the body, so neurosurgery is still in its infancy.

Transplant surgery has advanced to the point where a whole face can be replaced, although patients still struggle with finer motor movements such as speech and facial expression.

Hospitals have seen the growth in infections and 'superbugs' such as MRSA over the last 10 years. These are highly resistant to even the strongest antibiotic and more research is needed into their cause and treatment.

Modern, high-tech surgery is very expensive and hospital trusts have to manage their resources carefully. They have to make difficult choices about who is in most need of an operation.

People Dates Key points

Public Health

Greeks

- Similar approach to the Egyptians. Hippocrates recommended keeping clean but the governments did nothing.
- Hippocrates advised on a 'Programme for Health' as a means to keep the 4 humours balanced. Known as the Greek Regimen; recommending careful diet and regular exercise. He advised to eat more and drink less in winter. In the summer eat less and drink more with more fresh vegetables.
- Regular exercise seriously promoted. Sport stadiums and gymnasiums were built all over Greece. Asclepions had exercising facilities.
- Sport including running, boxing, wrestling and discus were part of the school curriculum for all Athenian boys aged 6-14. After showers were compulsory.
- Diocles of Carystus, an Athenian physician who had studied Hippocrates, recommended regular exercise such as walking followed by bathing and then cleaning teeth.
- The rich had the time to bathe and exercise. Ordinary citizens such as slaves and farmers found it difficult. Hippocrates advised them to do the best they could.

People Dates Key points

Public Health

Romans

Plans to keep ordinary people as well as the rich healthy. They chose where they built towns carefully e.g. Away from swamps, near to rivers.

Features:

- Aqueducts – fresh water into towns
- Water Pipes – brought filtered water into towns
- Drinking Fountains – could drink and collect water for washing
- Bathhouses – small fee people could exercise and bathe
- Latrines/Toilets – flushed using water and drained into the sewers
- Sewers – built of stone and took waste water away from the town

Health of their army was very important so camps were built near fast-flowing water.

The army built medical hospitals in England and Germany. Soldiers could be treated by *medici*. Each had its own sewer system.

Why?

- Health of the army kept empire strong
- Healthy slaves/workers necessary for maintenance of the empire
- Governments saw the public health as a priority
- Had the engineering and construction skills needed to plan and build
- Had a vast army of slaves to work
- Rome was wealthy, taxation = effective
- People of Rome were proud of their city.

Effective?

- Bathhouses water usually only changed once a week – likely source of disease
- Sewers were often open so bad smells were common and the threat of disease
- Romans could not stop epidemics eg Plague
- In villages – no bathhouses or sewers
- When the army returned to Rome, new towns in Europe were left empty so facilities fell into disuse and disrepair.

 People

 Dates

 Key points

Public Health

Middle Ages

In 500AD the Roman Empire was under attack from Barbarian tribes such as the Goths, Vandals and Huns. These tribes were illiterate and not interested in public health or engineering. As a result the public health facilities fell into disrepair.

Medieval towns became filthy, few public toilets and cesspits were near to wells. Did not improve till 1200 when for example cess pits were lined with stone.

Why so bad?

- No knowledge of prevention
- Roman facilities destroyed
- Towns full of animals
- Unpaved streets were impossible to clean
- Houses were tightly packed together
- Paid officials found it hard to remove all rubbish and filth
- Governments not strong enough to impose a regime. Kings were more interested in war than health.

Black Death 1347-49

Terrifying epidemic from China. Spread along trade routes. Estimates suggest at least 1/3 of the population of Europe

Causes

- Bubonic plague carried by rats and spread by fleas. Passed on when infected fleas bit other rats or humans

Explanations

- A punishment from God
- Result of the planets being out of alignment
- Work of Jews or other outsiders
- Caused by bad air, dead bodies or stagnant water

Treatments

- Prayer
- Flagellants whipped themselves to show repentance
- John of Burgundy in 1365 advised people to avoid baths as opening the pores of the skin allowed diseases into the body
- Also suggested to follow Galen's 'Theory of Opposites' fever with cold foods like cucumbers.

People Dates Key points

Public Health

Epidemiology – the study of disease and populations

1800s

Living conditions:

Unscrupulous landowners built cheap, low-quality slum houses.

No laws forcing local councils to provide sewers or clean water. Human waste and rubbish on the streets. Disease spread rapidly.

- **Cholera**

New and deadly disease that spread from India to Britain in 1831.

So Boards of Health were set up but were not compulsory and disbanded after the epidemic died down.

In 1838 Doctors Arnott, Kay and Smith researched living conditions among poor people in London and were horrified. Prompted Chadwick to carry out a nationwide survey of the poor.

Further cholera epidemics were recorded in 1848 and 1854. These made the wealthy realise that they could neither ignore nor dismiss the causes or effects of the disease.

Little understanding of the causes of disease. Some still believed God was punishing sinners and some in miasma.

John Snow; London doctor. First to use chloroform and ether as anaesthetics. Helped Queen Victoria give birth. Believed cholera was caused by the water.

Seen as the father of modern epidemiology.

He mapped where the cholera victims lived and saw that cases were clustered around a water pump in Broad street in 1854. 500 people had died in 10 days. He persuaded the council to remove the handle.

It was later discovered there was a leaking cesspool nearby.

Many refused to accept his findings because they did not know why there was a link. Consequently many scientists and doctors held onto theories like miasma and spontaneous generation.

Cholera – deadly water-borne disease causing death through diarrhoea and dehydration.

Miasma – the belief that disease was caused by bad or poisoned air.

Spontaneous generation – the theory that decaying matter turns into germs.

People

Dates

Key points

Public Health

1800s

Edwin Chadwick

1842 published 'Report on the Sanitary Conditions of the Labouring Population.' proving that poor people in towns lived in overcrowded and unhygienic conditions. This led to: illness, low life expectancy, absence from work, no wages, rich having to pay higher taxes.

Chadwick's solution was for the govt to provide public health facilities such as sewers and clean streets and to appoint Medical Officers.

Opposition

- Many rich taxpayers objected to paying for improvements to facilities they would not use.
- Local councils resented orders from the central government.
- Many people in govt believed in the 'laissez-faire' approach.

1848 Public Health Act was the first of its kind.

Effects of the 1848 Act include;

Setting up a National Board of Health

Local councils had powers to improve the water supply and the sewers

Councils appointed Medical Officers of Health as well as local Boards of Health to supervise improvements.

It was not compulsory and only suggested improvements. When the threat of cholera faded the National Board of Health was abolished in 1854.

William Farr: recorded data about the population. From 1837 all births, marriages and deaths had to be recorded by law.

Farr used the statistics to map areas with high death rates and looked up causes of death. He proved that unhealthy living conditions and high death rates were related. He shamed many local councils into action.

Octavia Hill: pushed for fair rent and access to open spaces for poor tenants.

In 1865 she started to buy slum houses and make them into healthy homes. Led to the Artisan's Dwelling Act (1875) which empowered local councils to clear away slums for public health reasons.

People Dates Key points

Public Health

1800s

Joseph Bazalgette and the 'Great Stink' (1858)

The level of the water in the River Thames dropped dramatically and the smell from the river became known as the 'Great stink' – (upset MPs as the Houses of Parliament are on the riverbank!)

Bazalgette was the engineer who designed and supervised the building of the new sewer system. 1000 miles of sewer.

He used an oval tunnel which made it self-cleaning.

Connected the sewers to pumping stations so sewage could be carried out to sea at high tide.

Ambitious project and took 10 years. His original design and construction is still part of London's sewage system today.

Other factors in public health reforms.

Knowledge:

1861 Pasteur published his 'germ theory'. By 1865 scientists accepted this and gave proof to Snow, Chadwick, Farr etc.

More people willing to pay to help

Education:

1884 the vote was given to workers in rural areas.

Voters were becoming more educated. People could read about current affairs including medical reports so put pressure on the govt.

Government:

Unwilling to make reforms compulsory because:

Wealthy landowners had the vote

Only people who would pay taxes for sewers etc.

In 1867 working men given the vote, new pressure on the govt.

Led to new laws designed to help people.

1875 Public Health Act:

Forced local councils to provide clean water, public toilets, effective drains and sewers

Forced councils to appoint Medical Officer of Health and other inspectors to examine and report on local public health facilities.

Pioneering local councils:

Birmingham and Leeds led the way in cleaning up their streets

Actions were a result or pressure being applied by local newspapers demanding change

In 1870 a Leeds firm got a court order preventing sewage being pumped into the river.

Birmingham council pioneered an approach known as 'municipal socialism'

Technology:

Engineering, methods of building and constructions and these were essential in the construction of public toilets and sewer networks.

People

Dates

Key points

Public Health

1900s

The Liberal party argued that social reform would make Britain's workers more efficient.

The following social reformers were instrumental:

Charles Booth: set out to investigate the East end of London. Discovered 35% of people were living in poverty. Published 'Labour and the Life of the People' in 1889. He proposed Old Age Pensions.

Benjamin Rowntree: Inspired by Booth. Carried out own survey about York ('Poverty, a Study of Town Life' (1901). Found that 29% of people in York were living in poverty. Close friend of Lloyd-George and so influenced Liberal reforms.

William Beveridge: wrote the report 'Social Insurance and Allied Services' to the government proposed that workers should pay national insurance each week, so that poor and unemployed people could receive benefits. Formed the basis of the welfare state including the NHS.

People

Group	Act	Effect
Children	Provision of School Meals Act, 1906	Local council had to provide school meals
	School Medical Services Act	Ordered the medical inspections of schoolchildren. By 1911 it showed that 1/3 of schoolchildren needed medical treatment
Old People	Old Age Pensions Act, 1908	Helped people over 70 who earned less than £21 a year by giving them a pension of 5 shillings (25p) a week. Pensions were introduced in 1909 and by 1912 1 million people were claiming them.
Workers	Workmen's Compensation Act, 1906	Forced employers to compensate employees in dangerous jobs for accidents in work
	National Insurance Act, 1911 (part 1)	Everyone between 16 and 70 paid 4p into a national fund to which the state and employer added another 5p. This money would then pay for medical care of the sick
Unemployed	Labour Exchanges Act, 1909	Unemployed people were helped to find work
	National Insurance Act, 1911 (part 2)	Introduced compulsory unemployment insurance. Workers paid a regular contribution into the fund. The unemployed received 35p of benefit for the first 15 weeks in any one year.

Limitations:

Free School Meals not compulsory

Pensions not for those that worked

Labour exchanges did not create jobs

Contributions to the National Insurance scheme were high for poor ppl

National Insurance Act – medical treatment was only for the worker not the family

During 1908 the Liberals lost support to the challenge of the Conservatives and Labour.

Public Health

1900s

In 1944 Beveridge recommended a National Health Service, providing health care that was free for everyone and funded through taxation.

Reactions: many enthusiastic but opposition included;

- Doctors thought they might become govt employees and lose the freedom to choose treatments and their right to charge fees for seeing patients
- Some councils objected to the govt taking over the management of their hospitals
- Some people though that poverty and sickness was the result of idleness and therefore a person's fault. Scared poor people would take advantage of it.

Benefits:

Minister of Health Aneurin Bevan (Labour) brought the NHS in in July 1948

- Free treatments for patients
- National ownership of hospitals
- Doctors were paid by the government

Life expectancy in Britain improved.

Limitations:

Increased pressure to provide services due to the population rising. The range of treatments has increased due to scientific and technological discoveries., costs have risen and people expect more. People are also living longer.

Therefore there are now some limitations to the original principals of free health care for all people;

- Some services are paid for; adults now pay for dental, eye tests and prescriptions
- Some services are so oversubscribed it takes time to get them e.g. Cancer treatment
- Other services are prioritised, whereby each NHS trust decides which treatments should be readily offered based on evidence of effectiveness and good use of taxpayers' money
- Some services are not offered universally, e.g. Fertility treatment may not be funded by the NHS in some areas of Britain.

People Dates Key points

Factors

Factor	Explanation	Example of helping change	Example hindering change
Religion	Anything to do with gods or spirits. Organised religion becomes a real factor from the Egyptians onwards.		
War	When countries are fighting each other, war causes and prevents change.		
Government	The influence of laws and other rules on people's health		
Personal qualities	An individual and their story, where they made the effort or had the expertise to change things.		
Chance	Luck, something that happens by accident!		
Communication	This is about people communicating their ideas and sharing them so that they can build on each other's ideas.		
Science and Technology	Science is anything involving experiments or careful observations. Technology is the use of equipment.		