

GCSE History – Medicine through Time Revision Notes

TOPIC 1 – PREHISTORY

Prehistory is the time before written records

Background Information

- Prehistoric people lived a nomadic life.
- They were hunter-gatherers and did not grow crops (until farming began around 10,000B.C.).
- They did not leave any written records so historians have to rely on archaeological evidence which is often hard to interpret.
- One way around the problem of evidence for prehistoric medicine is to study people who, until very recently, lived in a similar way to prehistoric man e.g. Australian Aborigines and Native Americans.

What did prehistoric people die from?

- Warfare
- Pregnancy and childbirth
- Infection
- Famine and food shortages

Using Aboriginal cultures to find out about prehistoric medicine

- Attitudes and practices of modern Aborigines are used to help us guess what ancient people did.
- Some modern Aboriginal medicine combines basic practical methods like setting broken bones and bandaging, with spiritual explanations for the causes of illness and cures.
- Witch doctors, shamans and medicine men are credited with the ability to cure and inflict illness.
- Warding off evil is practised as well as driving off the evil. Rituals are often involved. Rituals involved herbs, potions and techniques of practical value – however, these are often seen as magic rather than medicine.

Natural Beliefs and Treatments

- Trephining is the cutting of holes in people's heads. Skulls show that people survived the operation because the bone continued to grow afterwards. It may have been done to allow evil spirits out or to grant special powers of communication with the spirit world.
- There were two types of healers; medicine men and women. Medicine men were important people in prehistoric tribes as they could deal with spirits.
- Women were in charge of everyday health and knew about the healing power of herbs. For every day ailments and injuries with an obvious cause, they had a simple range of simple, effective remedies based on observation and common sense.

Supernatural Beliefs and Treatments

- Prehistoric people thought that everyone had their own spirit and these explained why you became ill.
- You may feel ill if your spirit had been removed from your body or if an evil spirit had entered your body whilst you were sleeping.
- Prehistoric man wore lucky charms to keep away evil spirits and to stay free from disease.
- If you became ill, medicine men would try to find your stolen spirit by hunting for the pointing stick which had removed your spirit. When they found it, they would throw it into moving water to set the spirit free.

TOPIC 2 – ANCIENT EGYPT

Background Information

- The Egyptian civilisation was an agricultural one that spread in a narrow band along the River Nile. Every year the Nile floods fertilised the fields and the river provided water for irrigation.
- Successful agriculture provided spare food so more people were doctors, priests and other professionals.
- More trade and communication – ships imported new herbs and plants, which were used as medicines.
- The Ancient Egyptians could write so ideas could be recorded and communicated better than previously.

Natural Beliefs and Treatments

- The Nile led some to suggest that, like the Nile and its irrigation systems, the body was full of channels. They thought these channels carried life-giving air, water and blood.
- They thought that you became ill if the channels of your body were blocked.
- They used purging, vomiting and blood-letting to unblock the channels when someone became unwell.
- These ideas weren't accepted by all and those who believed them didn't necessarily stop using spiritual treatments. They also used herbs and other natural ingredients for medicines.
- The Egyptians also knew diet was important – medical procedures included recommended foods.

Supernatural Beliefs and Treatments

- The Egyptians believed gods could cause and cure disease e.g. Sekhmet who was thought to cause and cure epidemics.
- Priests kept books which contained accepted treatments and spells. The instructions were exact as to what should be done, what medicines given and what words should be used when talking to the patient.
- Some drugs used, including opium, are used today. They were probably thought of as a way of keeping away evil.

Supernatural Beliefs – Mummification of Dead Bodies

- Egyptians believed that the body was needed in the after-life. They preserved bodies through mummification.
- They prepared bodies for mummification by taking out soft organs such as the brain and intestines, then drying what remained with salt. This gave the Egyptians some knowledge of anatomy.
- They believed that destroying someone's body meant that they couldn't go to the afterlife, so experimental dissection was not allowed. This limited the amount of knowledge that could be gained.
- Egyptian papyri have been found that outline some surgical procedures. Carvings in temples have also been found which show a variety of surgical instruments.

Observation and Writings

- The Egyptians were the first to have proper doctors. Egyptian doctors actually looked at their patients.
- Diagnosis means the observation of a patient and the recognition of their symptoms.
- Egyptian writings on papyrus rolls survive that show that they included diagnosis in their medical rituals.

Ancient Egyptian Hygiene

- Cleanliness was important to the Ancient Egyptians. They bathed, shaved their heads and had toilets. They also changed their clothes regularly.
- In the hot Egyptian climate this would have made life more comfortable but hygiene appears to have had a religious significance – priests washed more than others. The Ancient Egyptian government did not provide public health facilities though.

A Summary of Ancient Egyptian Medicine

What was new?	What stayed the same?
There were specialist doctors	People still had supernatural beliefs, they believed that gods and spirits caused disease
Doctors started to look for logical causes of disease and could identify some parts of the body	People still did not understand how the body worked
New herbs were used as medicines	People still not understand what caused disease
Metal instruments were used for surgery	
Medical ideas were written down on papyrus	

TOPIC 3 – ANCIENT GREECE

Background Information

- Grew more than enough food and traded with many other Mediterranean countries.
- They used slaves which gave the Greeks time to educate themselves.
- Wartime wounds needed treatments and doctors began to learn about anatomy.
- Wealthier people could employ doctors.
- Improvements in the strength of materials helped to make better surgical instruments (brass was replaced by steel).

Natural Beliefs and Treatments

- Aristotle (famous Greek philosopher) suggested the body was made up of four humours – blood, phlegm, yellow bile and black bile. This idea was taken up by Hippocrates. These humours were linked to the four seasons and the four elements. They needed to be in balance for good health (equal amounts of each in the body).
- Treatments developed from the theory aimed at bringing humours into balance. You could get rid of an excess humour by purging, vomiting or blood-letting.

Natural Beliefs and Treatments – Hippocrates

Hippocrates is acknowledged as the father of modern medicine. He was born on the island of Kos (Greece) in c. 460 B.C. and died in c. 370 B.C. [c. means ‘approximately’].

- He believed in natural causes of disease (not spiritual), and encouraged doctors to treat illness using natural methods. He believed those offering spiritual treatment were tricksters.
- The Hippocratic Oath was a promise made by doctors to obey rules of behaviour in their professional lives. New doctors nowadays still take the oath.
- The Hippocratic Corpus was a collection of medical books, some written by Hippocrates and his followers.
- Hippocrates also came up with the “clinical method of observation” which doctors still use today. This involves studying a patient’s symptoms to diagnose their illness and giving them a prognosis together with treatment.

Healthy Living

- The Ancient Greeks believed that to be healthy they needed to exercise.
- Hygiene was important with emphasis placed on washing.
- Diet was also thought to be important. Many Greeks followed a diet that changed with the seasons – eating lots in winter, but drinking little – while in summer drinking more and eating less.

Supernatural Beliefs and Treatments – The Greek God of Healing, Asclepius

- Temples dedicated to Asclepius were called Asclepions and people went to stay there when they became ill.
- Visitors bathed and relaxed, prayed to Asclepius and slept in a building called an abaton. An abaton was a building with a roof but no walls. Whilst sleeping a god came to them in a dream and cured them.

- Priests also did “ward rounds”, performing rituals which involved placing snakes on their patients. Snakes were believed to be able to help Asclepius cure people.
- People gave offerings to the god Asclepius as a thank you. Sometimes they left a votive stone in the shape of the body part cured.
- Success stories were recorded in inscriptions on the walls of the asclepiions.
- Asclepius’ daughters, Hygeia and Panacea, were also involved in healing.

Alexandria and Dissection

- The library at Alexandria attempted to collect all the knowledge of the world.
- Unlike in the rest of Greece, human dissection was allowed in Alexandria.
- Alexandria became famous for training doctors and surgeons. Accurate observation was key to many of the advances made there. Doctors then left Alexandria to practise all over the world.
- Erasistratus identified the differences between arteries, veins and nerves and saw that nerves were not hollow and so couldn’t be vessels for fluid (which is what the Ancient Egyptians had believed).

Surgery

- Surgical practices advanced only slightly in Ancient Greece. However, surgery was still a very risky procedure.
- Ancient Greeks used surgery as a last resort – most treatments were performed outside the body.
- Surgeons developed good techniques for setting broken bones and in extreme cases would amputate.
- A range of surgical instruments were developed, made from iron, steel and brass.

TOPIC 4 – ANCIENT ROME

Connections between Greek and Roman Medicine

- Greek doctors were unpopular because they were foreign and some were jealous of their skills. Many Greek doctors had been taken as slaves during wars between Ancient Greece and Ancient Rome. They started to become common from 200 B.C. onwards.
- The main medical books used in Rome were those written by Hippocrates and his followers who were Greek.
- The Romans took over universities and libraries at Alexandria, which had been the centre of medical learning.

Background Information

- Many Romans were very wealthy.
- People of Rome were taxed.
- It was a slave-owning society.
- The Romans had a large empire around the Mediterranean.

Public Health

- The Romans noticed that bad smells, unclean drinking water, sewage, swamps and dirt made people become ill.
- They built aqueducts to carry clean water to cities.
- They also built public baths, toilets and sewers to remove waste water.
- Ideas about the importance of public health spread around their empire.
- However, many baths did not change their water more than once a week. Public health facilities did not prevent infectious diseases e.g. plague from spreading.
- Providing public health facilities was motivated by their desire to keep the population and with it the army healthy. They needed them to maintain and increase the size of their empire. Providing good facilities also helped keep conquered peoples in their empire on side.

Claudius Galen

- Born c. AD129 in Pergamum, Greece (now modern day Turkey).
- He wrote over 60 medical books.
- Galen was a Greek doctor working in Roman times.
- Like Hippocrates, he believed that illness was caused by an imbalance of the four humours. Just as Hippocrates did, he advised doctors to observe patients carefully and record symptoms.
- He developed the idea of treating people with “opposites” to rebalance their humours e.g. a hot pepper for a cold.
- Galen discovered the brain not the heart controls the speech.
- He found that arteries as well as veins carry blood through the body.
- Proved that animals’ anatomy is different to humans.
- He remained important for 1500 years because his ideas about “perfect design” and “one creator” fitted in with the beliefs of the Roman Catholic Church. His work was taught as the “truth” in Church controlled medical schools and universities.

HOWEVER...

- Galen made many mistakes because he dissected animals not humans, e.g. he said that one human kidney was higher than the other (which it isn’t). This is true for apes but not humans.
- He said there were holes in the septum of the heart which would let blood pass from the right to the left side (which there aren’t).
- Galen also believed that blood was consumed (like petrol in a car) rather than circulated.

Beliefs and Treatments

- Romans were not as interested as the Greeks in developing theories about the causes of disease.
- Doctors recommended more exercise, changes in diet or prescribed herbal medicines as opposites.
- Doctors were too expensive for most people. In early Rome especially, the head of the household (the father) was expected to look after the medical needs of the household. They would use herbal remedies and common sense methods.

Surgery

- The most common surgical treatment was bleeding.
- Internal operations were still rare because they were too risky.
- There were amputations; trephining was used to relieve pain in the head.
- Fighting lots of wars improved their surgical knowledge.

What was new?	What stayed the same?
Good harvest, better houses, more food	Diseases could not be stopped from spreading
Trained doctors in the army and in towns. Military hospitals (valetudinaria) could be used by civilians.	Women treated most health problems, often herbal remedies and common sense methods
Wider range of herbal medicines	The poor did not benefit from the new public health schemes.
Fresh water supplies, sewers and baths.	

TOPIC 5 – MEDIEVAL

Background Information

- Wars destroyed the Roman public health systems and medical libraries.
- The rulers of the small kingdoms built up armies rather than improving medical skills or public health.
- War disrupted trade so countries became poorer.
- Travel became more dangerous, reducing the communication between doctors.
- Training of doctors was abandoned. Copies of Galen's books were either lost or hidden away for safety.

HOWEVER, LATER...

- The Church had set up universities where doctors could be trained e.g. in Salerno in Italy.
- Armies took trained doctors to war with them where they gained experience as surgeons.
- Rules were made (but not always enforced) to clean up towns.
- Merchants and scholars were once again travelling around Europe, sharing ideas.

Influence of the Christian Church

- The Christian Church grew stronger during the Middle Ages (Medieval times).
- Monasteries controlled education, priests and monks were the only people who could read. The Church opened medical schools where the ideas of Galen were taught.
- The only libraries were in monasteries. The Church sometimes banned books they did not want people to read.
- Monasteries made an effort to provide clean running water and toilets although this was usually only for the monks in the monasteries.

Medieval Hospitals

- Medical care for the poor came from hospitals set up by monasteries, and run by monks and nuns.
- They provided '**hospitality**' for visitors.
- Genuinely ill people were often turned away due to a fear of disease spreading!
- Many hospitals were very small with some having 12 beds (like the number of Jesus' disciples). Some such as the one in York were very large with 200 beds (but no doctors!).

The Return of Hippocrates and Galen

- Galen's ideas were rediscovered. Church leaders looked carefully at Galen's works and decided that they fitted in with Christian ideas because he referred to "the creator" in his works.
- Doctors in the Middle Ages believed his ideas were correct and it was nearly impossible to improve his work.
- Galen also had great influence on the doctors in the Islamic World and in Medieval Christian Europe.
- Medical schools began to appear in Western Europe, starting with one in Salerno, Italy. Translations of Galen's and Hippocrates' work were accepted as the absolute truth in medical schools.

Arab Medicine

- Islamic scholars picked up and developed ideas from the Greeks whom they greatly admired.
- Baghdad became a centre for translating medical books.
- Aristotle's four humours, Galen's treatment by opposites and Hippocrates' clinical observation lived on.
- Books were written that brought together the ideas of Aristotle, Galen and Hippocrates. These books were important means by which these ideas got back to Western Europe.
- The attitude of Muslims towards the Koran meant that they were unwilling to criticise the works of Galen.
- Important Islamic individuals – Rhazes and Avicenna.

The Four Humours Theory

- Medieval doctors believed illness was caused by an imbalance of the humours.
- The theory developed into a more complex system, based on the position of the stars.
- Although some human dissection was carried out in medical schools, findings were interpreted as the theory of the four humours – although some later doctors began to challenge traditional understandings.

New Developments in Medieval Medicine

- More medical schools sprang up and human dissection began to be allowed. There began to some doubts about classical texts e.g. Galen.
- New techniques included diagnosis by urine sample (uroscopy). This is a good aid to diagnosis which is still used today!
- Doctors also believed the stars caused disease and relied on astrology when deciding on treatments.
- Trained doctors were very expensive. Most medical help was provided by monasteries and housewives using traditional cures and their experience.

Supernatural Beliefs and Treatments

- The Church believed that illness was a punishment for sins – they prayed to God if they became ill.
- Some believed that pilgrimages to holy shrines could cure illness (people still believe that nowadays).
- Doctors had superstitious beliefs, saying magical words when treating patients and consulting stars.

Developments in Surgery

- In the Middle Ages, there was great demand for surgery because of warfare.
- Surgery was held in such low regard that surgery was left to untrained barber-surgeons.
- Wine was first used as an antiseptic.
- Surgical treatments were still simple as major surgery was still very risky.

Public Health Measures

- Towns lacked the public health schemes of the Romans. When rules about public health were made they weren't always enforced.
- People relied on cess-pits and wells. Waste was often disposed of in the streets.
- People found it healthier to drink beer than to drink water (the water for beer has to be boiled).
- People did not want to pay taxes to pay for improved public health. The king did not think it was his responsibility and many people still thought illness was caused by God anyway.

The Black Death – 1348

- Spread by flea bites from fleas on black rats (bubonic plague) or by coughs and sneezes (pneumonic plague). Black rats came off ships that had been in areas affected by plague.
- Arrived in Britain in 1348. Its victims were struck down quickly and most died. The rats also died.
- Symptoms included exhaustion, high temperatures, swellings (buboes) and difficulty breathing.
- Ships were made to wait 40 days before landing – they were quarantined.
- Estimated to have killed about 50% of Europe's population.

What did people in Medieval times think caused the plague and how did they treat it?

- Miasma – carried sweet smelling herbs. Lit fires (smoke was thought to clear the air of disease).
- God – tried to appease God by praying or becoming flagellants (whipping themselves to show God how sorry they were in the hope he would stop the plague).
- Humours were out of balance – use of opposites, purging, vomiting and bleeding.
- Poisoned water – blamed the Jews.

TOPIC 6 – THE RENAISSANCE

Background to the Renaissance

- The word 'Renaissance' means 'rebirth'.
- There was a greater interest in how the human body worked based on observation and dissection.
- Artists went to dissections of human corpses and did very detailed illustrations for medical books.
- A renewed interest in classical texts (from Ancient Greece and Rome) led to renewed faith in the four humours theory and the treatments by opposites.
- This was the 'Age of Exploration'.

Andreas Vesalius (1514-1564) – Anatomy

- Studied anatomy, became professor of surgery and anatomy at Padua. He was allowed to do dissections.
- Did his own dissections and wrote books on his observations using accurate diagrams to illustrate his work. His most famous book was 'On the Fabric of the Human Body' written and published in 1543.
- He pointed out some of Galen's mistakes. He found the liver has two lobes not five, that the human jaw is one bone not two and that the blood in the heart does not travel through tiny holes in the septum.
- Vesalius encouraged other doctors to question old knowledge, to dissect and look for themselves.

Ambroise Paré (1510-1590) - Surgery

- Paré was a battlefield surgeon (learned as an apprentice to his brother, a barber-surgeon); this was still a low status profession.
- In battle, he ran out of boiling oil which was used for treating gunshot wounds. Paré made an old Roman ointment of roses, turpentine and egg yolk. The patients he used this on recovered much quicker than those who had their gunshot wounds treated with boiling oil.
- Paré developed ligatures to seal wounds instead of using a cauterising iron. Problem with ligatures = not sterile so could cause infection, slow to use. Many serious problems still remained to be solved e.g. no anaesthetics, antiseptics, no understanding of blood groups or of how to stop blood loss.
- Carried out an experiment to disprove Galen by proving the bezoar stone wasn't a treatment for poison.
- Wrote 'Notes on Surgery'. Wrote his books in French not Latin so more people could read them. Encouraged other surgeons to think for themselves and not just rely on books.
- Became surgeon to four French kings.

William Harvey (1578 - 1657) – Circulation of the Blood

- Discovered the circulation of the blood, disproving Galen's idea that blood was used up in the body like petrol in a car.
- Identified the difference between arteries and veins.
- Became doctor to King Charles I.
- To spread his ideas he wrote, "An Anatomical Account of the Motion of the Heart and Blood" in 1628 which explained how blood circulated around the body.
- However, bleeding still continued to be used as no-one was quite sure what to do instead! Blood groups were not discovered until 1901 so Harvey's discovery was not very useful until much later on.

The Great Plague of 1665

- Plague returned approximately every 20 years with the worst example being the Great Plague of 1665. The death toll in London was about 100,000.
- Efforts were made to control the spread of the disease. Families were locked in and red crosses were painted on their doors with the words 'Lord have mercy on us'.
- Carts organised by the authorities roamed the city to the cry of "Bring out your dead!" They collected corpses for mass burial in 'plague pits'.

- People realised plague was contagious although they still didn't understand that germs caused disease.
- People also realised that the poorest, dirtiest areas in London seemed to have more cases of plague.
- Cold weather and the disease having run its natural course put an end to the outbreak. The Great Fire of London destroyed many areas. The rebuilt buildings were healthier for a while, until the city began to fill up again.

Public health

- There were many wars during the Renaissance. Wars took resources away from public health.
- Population in towns and cities began to increase which placed a heavy burden on water supplies and drains.
- Governments and councils did not devote time or money to improving public health unless there was an outbreak of disease. Although laws existed to prevent unhygienic practices, these were not always enforced.

What factors affected progress in medicine during the Renaissance?

- **The Printing Press** – new ideas could spread more easily and rapidly now books were printed rather than copied out by hand.
- **The Weakening Power of the Church** – people had fewer religious beliefs about the causes of diseases, meaning that people started to look for natural causes. Doctors could now dissect with more freedom.
- **Artists Drawing from Life** – medical drawings could be drawn and shared amongst doctors through medical books, new anatomy books were produced.
- **Renewed Interest in Ancient Learning** – people wanted to learn how to read, they began to challenge old medical ideas (e.g. Galen's holes in the septum).

TOPIC 7 – 1750 TO 1900

Background Information

Why Had They Stopped Reading Galen in the Nineteenth Century?

- New understanding of the human body was being developed. Galen's descriptions were incomplete and sometimes wrong.
- Theory of the four humours was no longer accepted. People thought miasmas caused disease instead.
- Doctors carried out dissections and used microscopes. Galen's books were no longer important.
- Greater discoveries began to be made in chemistry (e.g. the discovery of hydrogen, oxygen and nitrous oxide) and physics with improvements being made in microscopes.

Disease and Infection

Smallpox and Edward Jenner

Inoculation

- In the 18th century, smallpox was a big killer. Lady Mary Wortley Montagu brought inoculation to Britain from Turkey.
- She discovered that a healthy person could be immunised against smallpox using pus from the sores of a sufferer with a mild form of the disease.
- However, this was very risky as no-one could predict how badly someone would get smallpox after being inoculated. Many people died.

Edward Jenner

- Jenner was a country doctor. He had heard that local milkmaids didn't get smallpox but instead a milder form of cowpox.
- Jenner investigated and discovered people who had already had cowpox didn't get smallpox.
- In 1796 he took a small boy and injected him with pus from the sores of a milkmaid with cowpox. Jenner then injected James with smallpox. James didn't catch the disease. He had been vaccinated against smallpox.

Opposition to the smallpox vaccination

- Nobody knew who Jenner was.
- Jenner could not scientifically explain how his discovery worked so no new vaccines could be developed.
- Inoculators and doctors were afraid of losing money if vaccination became popular.
- Many were worried about side-effects; they worried about giving themselves a disease from cows.
- Some members of the Church believed that vaccination was not natural. They also believed that smallpox was a punishment from God and people should pray for recovery.
- Many people did not like the fact that the government made vaccination compulsory from 1852 and strictly enforced it from 1872. From 1871-1887, parents could be fined for not having their children vaccinated.

What impact did the smallpox vaccination have?

- Enforcing vaccination had a dramatic impact on the numbers of people dying from smallpox. It saved thousands of lives.

Developments in Nursing

Florence Nightingale

- From a wealthy background, she became a nurse despite the opposition of her family.
- Was asked to go out to the Crimean War by Sidney Herbert (Minister for War) to sort out nursing care.
- She made huge improvements in the death rate by improving hygiene on the wards (cleaned floors, boiled sheets and provided all patients with proper beds) and by building a new ward block with her own money.
- When she returned home she wrote a book, 'Notes on Nursing' which was published in 1860.
- She also wrote an 800 page report for Queen Victoria on how to build better hospitals.
- She set up a training school for nurses in London.
- She brought discipline and professionalism to a job that had a bad reputation at the time.

Mary Seacole

- From a poor background in Jamaica. Seacole volunteered to help as a nurse in the Crimean War; she was rejected but went anyway by paying with her own money to go.
- She nursed soldiers on the battlefield and built the 'British Hotel', a hospital that looked after British soldiers.
- Went bankrupt when she returned to England – but received financial support due to the interest in her story shown by 'The Times' newspaper. She also wrote her autobiography.

How did Scientists Discover the Causes of Disease?

Louis Pasteur's Germ Theory – 1857

- Scientists thought microbes were caused by disease and appeared because of illness. This was the Theory of Spontaneous Generation. Instead of blaming microbes for illness, they blamed miasmas.
- Louis Pasteur was employed in 1857 by a brewing company to find an explanation for why sugar beet used for making industrial alcohol went sour. His answer was to blame germs in the air.
- He proved there are germs in the air by sterilising water and keeping it in an airtight flask. This stayed sterile – but sterilised water kept in an open flask bred microbes again.

Robert Koch

- German scientist. He began linking diseases to the microbe that caused that specific disease.
- Koch developed a solid medium to grow cultures, and dyeing techniques to colour microbes which he viewed and photographed through a high-powered microscope.

- He identified anthrax spores and the bacteria that caused septicaemia (blood poisoning), tuberculosis (TB) and cholera.

Louis Pasteur – Chicken Cholera Vaccine

- Hearing of Koch's discoveries, Pasteur came out of retirement and competed to find new microbes and ways to combat them.
- Pasteur looked for cures for anthrax and chicken cholera. Both he and Koch worked with large teams of scientists. Charles Chamberland was in Pasteur's team.
- Chamberland was told to inject chickens with chicken cholera, but it was the day before his holiday and he forgot. He left the germs on his desk and injected the chickens when he came back from his holiday.
- The chickens survived, Pasteur and Chamberland tried again with new germs but the chickens survived.
- The chicken cholera had been weakened by being left out and the weakened cholera made the chickens immune. Chamberland's error had produced a chance discovery.

Development of other Vaccines

- Pasteur's team managed to produce a weakened version of the anthrax spore that would make sheep immune to the disease. They demonstrated this in a public experiment.
- Pasteur also developed a vaccine for rabies.
- Other vaccines were soon developed by other scientists including ones for typhoid (1896), TB (1906), Diphtheria (1913) and Tetanus (1927).

Overcoming the Problems of Surgery

Surgery in the 1800s was **dangerous** and **painful**. **Infection** was the greatest danger to patients.

What problems faced surgeons in 1800?

1. **Pain** – patients can die of clinical shock during surgery.
2. **Infection** – people did not know that microbes could cause infection. Surgeons would wear the same dirty apron for every operation they carried out (which was supposed to show how experienced they were). This passed on infection between patients.
3. **Bleeding** – patients can die if they lose too much blood during surgery.

How was the problem of pain overcome?

In 1800, surgeons tried various ways to ease the suffering of patients – e.g. getting them drunk, knocking them out or using opium (like heroin).

Nitrous oxide or 'laughing gas' was discovered by Sir Humphrey Davy. It was never really widely used as Davy's findings were published in a book with an obscure name which wasn't well known to many people.

Ether was used by J.R.Liston during a leg amputation. However, it had very unpleasant side effects and people could overdose on it easily. It also caught fire very easily making operations very dangerous!

Chloroform was used by James Simpson and some friends at his home in 1847 (they experimented by sniffing it and knocked themselves out!). They realised that it could be used during surgery. However, it led to unexplained deaths. The dose given couldn't be measured nor could it be controlled.

Reasons for **opposition to anaesthetics**:

- Chloroform was new and untested. People worried about the possible side effects. In 1848, 15 year old Hannah Greener died during an operation to remove her toenail after being given a dose of chloroform. People were not willing to risk it so went back to using ether mixed with nitrous oxide.
- Some doctors believed that pain was good for healing. Many also believed that pain in childbirth (a particular concern of James Simpson who was a Professor of Midwifery) had been sent by God. It was unnatural to want to get rid of it.
- Some surgeons got carried away when their patients were asleep and caused more deaths by attempting complex operations which resulted in more blood loss and much worse infections as they went much deeper into the body.

The final acceptance of chloroform came when Queen Victoria used it for the delivery of her eighth child in 1857. The acceptance of the queen meant other people trusted it.

Over time other chemicals were introduced which were safer than chloroform and local anaesthetics e.g. novocaine were discovered which made minor operations easier and safer to perform.

How was the problem of infection overcome?

Until the germ was discovered by Louis Pasteur in 1861, surgeons didn't take precautions to protect open wounds. They reused bandages, didn't wash their hands before operations and didn't sterilise their equipment (they didn't know they had to kill germs as they didn't know they existed!).

Joseph Lister and the discovery of antiseptics (**antiseptic surgery**):

- Heard about the use of carbolic acid on sewage. He knew sewage had a similar smell to gangrene.
- He had read about Pasteur's discovery of the germ (germ theory).
- He was prepared to take risks by trying something new (spraying carbolic acid on to patients as they were being operated on).

Reasons for **opposition to Lister**:

- Lister's methods slowed down surgery (difficult to operate through a spray!).
- The spray was uncomfortable for surgeons to use as it made their skin dry up and crack.
- Pasteur's germ theory was not widely accepted although more scientists accepted it after a series of public experiments in 1864.
- Surgeons did not copy his methods properly so did not achieve such good results.

The final development of antiseptic surgery was **aseptic surgery**:

By the late 1890s, Lister's antiseptic methods had led to aseptic surgery. This is the removal of all possible germs from operating theatres to ensure absolute cleanliness. The following methods were introduced...

- Operating theatres and hospitals were rigorously cleaned.
- All surgical instruments were steam sterilised.
- Sterilised rubber gloves were invented in 1899 (by William Halstead) and surgeon's hands were scrubbed before an operation.

How was the problem of bleeding overcome?

Once William Harvey had discovered the circulation of the blood, the first blood transfusions were attempted.

Early blood transfusions often ended disastrously because...

- Blood groups had not been discovered so patients' bodies rejected the new blood and they died.
- They could not prevent the blood from clotting nor could they store any blood they collected for transfusions.
- Infection with blood-borne diseases could be passed on.

These problems weren't overcome until after 1900.

Developments in Public Health

Public Health Problems in the Early 1800s

- Between the late 1700s and about 1850, living conditions in British towns and cities became worse than ever.
- Houses were built as close together as possible as more people crowded into factory towns to work (they needed to live near to the factories due to a lack of public transport).
- Towns could not cope with the need to provide so many new people with houses, water, drains and sewers.
- In these squalid conditions, disease spread easily and very quickly. Diseases such as tuberculosis, measles, whooping cough, typhoid, cholera and diphtheria resulted in a high death rate, especially amongst children.
- The conditions became so bad that many people's health became even worse than ever before.

The Battle to Improve Public Health

- Some thought that the government should force local councils to clean up their towns to improve conditions.
- However, many believed that the government shouldn't interfere – this attitude is called laissez-faire.
- They believed that the government should allow each local area to control its own affairs.
- This meant that local ratepayers (homeowners who could also vote in elections for the government) made all the decisions. Local ratepayers didn't want the government to force them to pay for improvements to their towns. These homeowners did not live in the houses in the worst areas so did not care about the conditions. Many of them also blamed the poor for their living conditions as they thought it was a result of the poor being too lazy or drunk to look after their houses properly.

Edwin Chadwick

- In 1842 he was asked by the government to report on the living conditions and the health of the poor.
- Chadwick concluded that poverty was caused by ill health which was caused by the terrible living conditions.
- He said that ratepayers could cut taxes and save money in the future by looking after the poor and spending money on improving their health as sick people cost money (they had to go to workhouses which the government had to pay for).
- In his "Report on the Sanitary Conditions of the Labouring Population", he said that industrial towns should:
 - Organise drainage and rubbish collection
 - Provide a clean water supply
 - Appoint a Medical Officer of Health to report on the health of the local population and supervise sanitary inspectors who sorted out public health problems like cracked drains or overflowing cesspits.
- For over 30 years an argument went on about the need for town councils or the government to take action. Towns such as Liverpool and Manchester did start to build sewage and water-supply systems.

1848 Public Health Act

- The government at first did nothing about Chadwick's recommendations in his report.
- However, in 1848 there was another outbreak of cholera. This put pressure on the government to do something. Parliament reluctantly agreed to pass the first Public Health Act.
- Although it was **not compulsory**, the government set up a Board of Health to encourage, but not force, local councils to improve conditions. The Board of Health was shut down in 1854.
- The government gave local authorities money to make improvements in their areas if they wanted to and had the support of local ratepayers.
- Only a few local councils took any new measures.
- By 1872, only 50 Medical Officers of Health had been appointed.

1854 Dr John Snow

- In 1854 Dr John Snow proved that there was a link between cholera and water supply. He used research, observation and door-to-door interviews to build a detailed map of a cholera epidemic in Broad Street, London.
- Nearly all the deaths had taken place within a short distance from one particular water pump.
- Near to the pump there was a brewery and none of the workers there had caught cholera. The brewery had its own water pump and the men had also been given free beer to drink. They hadn't used the Broad Street pump at all.
- After collecting all his evidence, John Snow removed the handle from the Broad Street pump so that no-one could use it.
- There were no more cholera deaths. It was later discovered that a cesspit nearby had a cracked lining which allowed the contents to contaminate the drinking water coming out of the pump.
- Snow put pressure on water companies to clean up their water supplies.

1858 Great Stink

- For years human waste made its way from the latrines (toilets) in London into the River Thames.
- In the summer of 1858 the hot weather caused a 'great stink'. The disgusting, putrid smell of animal and human waste that was floating in the Thames and drying on its banks at low tide was right under Parliament's nose.
- Parliament considered moving. They also coated the curtains in parliament with a deodorant to get rid of the smell (remember- they thought bad smells caused disease).
- The Great Stink prompted Parliament to sort out London's sewage and drainage system to clean up the River Thames.
- Within a year, Joseph Bazalgette had begun to build an extensive system of sewers and drains that are still being used today. He built 83 miles of main sewers underground and made of brick. He also built 1,100 miles of sewers for each street that were connected to bigger main sewers. The sewage in these sewers was pushed along the pipes by pumping stations.
- It was such a big project that it took until 1875 to finish.

1867 Second Reform Act

- Working class men in towns were given the right to vote (working men in country areas didn't get the vote until 1884).
- For the first time it wasn't just ratepayers who got a say in improving public health.
- MPs were forced to improve the living conditions of the poor as they were now their voters.

1875 Second Public Health Act

- Unlike the 1848 Public Health Act, the 1875 Public Health Act actually **forced** local authorities to introduce the following measures:
 - Provide clean water
 - Provide proper drainage and sewers
 - Appoint a Medical Officer of Health.

Why was the act introduced?

Factor	Explanation
Scientific developments	In 1861 Louis Pasteur published his germ theory. This proved the link between dirt and disease. With scientific proof, people were more willing to pay taxes to cover the cost of public health reforms.
New voters	Working class men in towns were given the vote in 1867. MPs were more likely to take notice of the victims of poor public health if they were able to vote.
Statistics	The government published statistics of where death rates were the highest and what people died of. The statistics shamed some unhealthy towns into doing something about public health.
Cholera outbreaks	When cholera returned again in 1865 and the link between disease and dirty water had been proven by John Snow, ratepayers were finally prepared to take action.
Weakening of laissez-faire.	The government saw that it could no longer leave public health measures to individuals or councils and realised that they had to take action.

The Public Health Act of 1875 was effective. By 1900 most British towns had built effective hygiene and water systems.

Results of the 1875 Public Health Act

- Local councils were forced to:
 - provide clean water
 - public toilets
 - proper drains and sewers.

Other acts were passed that:

- Improved the standards of housing in towns
- Stopped the pollution of rivers (from which people got water)
- Shortened working hours in factories for women and children
- Made it illegal to add ingredients that made food unhealthy
- Made education compulsory (more people could then read and follow written health advice).

Public Health – 1800 to Today

Limited - 1830s	Optional - 1848	Compulsory - 1875	Comprehensive – 1948
A few towns introduced sewers, rubbish collection and clean water.	1848 Public Health Act, towns could set up Boards of Health if 10% of ratepayers voted for it.	1875 Public Health Act, councils forced to provide basic sanitation (water, toilets, drains and sewers) and medical officers of health.	From 'cradle to grave', pensions, national insurance, a welfare state and the NHS.

TOPIC 8 – 20TH CENTURY

PUBLIC HEALTH

Liberal Social reforms 1906-1914

Although public health was beginning to improve and life expectancy was beginning to rise by 1900 (46 for men, 50 for women), there were still major health problems caused by poor living conditions and poverty. These included:

- High infant mortality
- Poor housing conditions
- Lack of knowledge about how to stay healthy.

Reports by Charles Booth and Seebohm Rowntree in the early 20th century highlighted the connection between poverty and ill-health. A Liberal government was elected with a landslide majority in 1906 as people expected them to do something to sort out those problems.

The reforms that they introduced included:

- 1902 – Compulsory training for midwives
- 1906 – Meals provided free for schoolchildren in need.
- 1907 – All births had to be notified to the local Medical Officer of Health. Health visitors visited each new mother to advise her about keeping her baby healthy.
- 1907 – Medical inspections of all school children in schools.
- 1908 – Old age pensions paid to people over 70 who did not have enough money to live on.
- 1909 – Back-to-back housing banned. New housing regulations enforced higher standards of house building.
- 1911 – National Insurance Act provided help for the sick. Workers, employers and the government each paid into a sickness fund. When a worker fell ill he received 10 shillings a week for up to 26 weeks and free medical care. This was paid for from the sickness fund. However, it did not cover his wife or family.
- 1912 – Clinics held in schools to give children free medical treatment.

Public health developments in the 1930s

- 1919 – Addison Housing Act. This said local councils had to provide good homes for returning soldiers. Over 250,000 new homes were built (not enough though!). In the 1930s many old, unhealthy slum houses were knocked down. Another 700,000 homes were built.
- The Depression in the 1930s saw unemployment rise to over 3 million. This left all these people outside the National Insurance Scheme. It also meant widespread hunger.
- The numbers of children dying young began to rise again as unemployed families could not afford proper food when their breadwinner was sick or not in work. Many workers also stopped paying their NI payments as they could not afford to keep them up.

The National Health Service from 1948

Influence of WW2

- WW2 brought people together. People understood better how people who didn't share the same background or class lived.
- Having to recruit armies from the general population made powerful people take notice of the health problems of the poor.
- Evacuation of children increased the awareness of how disadvantaged some people were. Many children from urban areas were undernourished, dirty, unhealthy and used to poor living conditions (slum housing).
- After WW2, people looked for improvements in society. There was a feeling that something good had to come out of all the suffering of WW2.
- Many people had received free health care during WW2 provided by the Emergency Medical Service. This proved a free health service that everybody could work.
- Such feelings led to the 1945 victory for the Labour Party.

Introduction of the NHS

- Sir William Beveridge was asked to produce a report by the government. He published his famous Beveridge Report in 1942. In it he called for the government to provide social security "from the cradle to the grave". The report became a bestseller.
- Aneurin Bevan was the Labour Minister for Health, who introduced the National Health Service on 5th July, 1948. It was free to everyone and paid for by taxes. People working in the medical profession became government employees.
- National Insurance was to be used to pay for the NHS. Everyone in work paid it and in return got benefits and the NHS.

What did the NHS provide?

The following were provided free to all:

- Hospitals, health centres, medical schools, teaching hospitals, maternity and child welfare clinics.
- Doctors, dentists, nurses, midwives, health visitors and specialists.
- Ambulances.
- Blood transfusions, vaccination, home-nursing and after care of the sick.

Why was there opposition to the NHS?

- Doctors were afraid they would lose their freedom and be unable to take private patients.
- Some people still believed the poor were often sick because they were lazy. They didn't think the poor deserved to be helped.
- They also thought providing an NHS would stop people taking responsibility for their own health. They believed it would stop people bothering to work if they knew health care was free.
- Local councils and charities did not like government taking control of local hospitals away from them.

However...

- Doctors and dentists were persuaded to work for the NHS as they were given a fixed price per patient. They were allowed to keep on treating private patients.

The NHS still has some problems...

- Governments have reduced how much of the NHS is free. Government had no idea how sick the population were until the introduction of the NHS. The cost of the NHS had doubled by 1950. Dental charges and prescriptions began to be charged for.
- Long waiting lists for operations and doubts about the quality of treatment have led to people paying for private treatment.
- Longer life expectancy has meant more need for care of the elderly.
- New expensive drugs, treatments and machines have meant increased costs for the NHS and arguments about whether certain treatments should be rationed.

What Medical Progress Did the First World War Bring About?

- Surgeons had the opportunity to experiment with new techniques. Surgeons developed techniques to repair broken bones (gun shots often broke bones as they passed through the body).
- Pioneering skin grafts also took place to treat damage from shells and bullets.
- Soldiers were promised good housing when they returned. This got rid of some slum housing.
- Surgery of the eye, ear, nose and throat all improved rapidly. Brain surgery also advanced (lots of head wounds as soldiers sometimes put their heads accidentally above the trench).

The Development of X-Rays

- X-rays were first discovered 20 years before WW1.
- Hospitals installed X-Ray machines in Britain but it was WW1 which confirmed their importance.
- More were manufactured to meet demand and they were installed in hospitals along the Western Front during WW1.
- X-Rays immediately improved the success rate of surgeons in removing deeply lodged bullets and shrapnel (bits of metal packed into bombs or the bomb casing itself) which would otherwise have caused fatal infections.
- Mobile X-Ray machines were also used on the front line. These were called 'petit curies' after Marie Curie a Polish scientist who had carried out work on how X-Rays could be used to diagnose and treat cancer and who had also persuaded the government of how useful they would be to surgeons treating soldiers.

Blood Transfusions

- During the Renaissance, William Harvey proved blood circulates and this encouraged experiments with blood transfusions.
- It sometimes worked and sometimes failed. Scientists did not yet know about blood groups.
- Blood groups were not discovered until 1901 by Karl Landsteiner. The discovery made transfusions successful as people could now be given the correct blood groups if they had a transfusion.
- During WW1 vast amounts of blood were needed. Transfusing people by having their donor lying next to them (as had been done before) was not practical on the battlefield.
- Many soldiers bled to death in the trenches before blood could get to them.
- The search began for a better method of storage and transfusion. Doctors discovered how blood could be stored for longer by adding sodium citrate (which stopped it clotting) and bottling it so it could be stored for later.

Impact of WW2

Impact	Explanation
Blood transfusion	Blood could be stored for longer and civilians donated blood so it could be used when needed.

Diet	Rationing improved some people's diet, government encouraged healthy eating.
Drugs	Penicillin was developed as the first antibiotic.
Poverty	Evacuation took children out of towns and cities. Highlighted the contrast between rich and poor children. Showed the need for more work on improving health and welfare.
Surgery	Development in the used of skin grafts and treatment of burns.
Hygiene	Government posters educated people about health and hygiene.

SURGERY SINCE 1900

Development	Explanation
X-Rays	See notes on WW1 above
Radiation therapy	See notes on WW1 above
Fighting infection and disease	Surgeons learned to cut away infected tissue. The mass production of Penicillin helped make infections after surgery less likely.
Blood transfusions	See notes on WW1 above
Plastic surgery	Over 11,000 plastic surgery operations were carried out in WW1. In WW2 more operations were carried out due to burns injuries in tanks and planes. Archibald McIndoe carried out 4,000 operations on burns victims.
Transplant surgery	First heart transplant carried out in 1967 by Dr Christian Barnard in South Africa. Kidneys and livers had been transplanted before that. Drugs to stop people's bodies rejecting new organs also had to be developed. Tissue-typing was developed to ensure organs could be matched correctly.
Improved anaesthetics	In the 1930s, Helmuth Wesse developed anaesthetics that could be injected into the blood stream. This allowed for more precise doses which were safer. Some local anaesthetics are now so effective that major operations e.g. hip replacements can be done without the need for a general anaesthetic.

DISEASE AND INFECTION

The Discovery and Development of Penicillin (the first antibiotic)

1. Fleming discovered mould killed germs. He had discovered the first antibiotic. He wrote articles in medical magazines about his discovery but these were not widely read.
2. Two scientists, Ernst Chain and Howard Florey, began research in Oxford after reading an article by Fleming. They experimented with mice.
3. Penicillin was first tested on a human in Oxford.
4. US government and Britain pay for the production of Penicillin.
5. Enough Penicillin was produced to treat all Allied forces wounded in the D-Day invasion of Europe.

How was Penicillin Discovered?

- The discovery of Penicillin is a great example of a CHANCE finding helping medicine.
- One day in 1928 Fleming came to clean up some old culture dishes he had been growing bacteria for his experiments on. By chance a fungal spore had landed and grown on one of the dishes.
- He noticed that the colonies of bacteria around the mould had stopped growing. The fungus was identified and the substance given the name penicillin. It clearly was producing a substance that killed bacteria.
- Fleming was unable to take his work further. The mass production of penicillin still needed work if it was going to be of any use for treating disease.

How Was Penicillin Developed?

- In the 1930s, two Oxford scientists, Florey and Chain, became interested in Fleming's article from 1929.
- In 1939 they gathered a skilled research team and three days after the outbreak of WW2, Florey asked the British government to pay for the team's research into Penicillin. The government only gave him £25 – they had a war to pay for so did not have enough to use for research into Penicillin.
- British chemical firms were too busy making explosives to start mass production – so Florey went to the USA.
- The American government agreed to help pay drugs companies to mass produce Penicillin. The casualties of WW2 added to the sense of urgency.
- By 1944 mass production in America and Britain was sufficient for the needs of the military doctors. Fleming, Florey and Chain were awarded the Nobel Prize in 1945 for their work on Penicillin.

Factors leading to the Development of Penicillin

Factor	Explanation
Government	British and American governments funded research and the mass production of Penicillin.
Technology	Microscopes and new bacteria growing mediums
Scientific experiment	Testing on mice.
Individuals	Fleming realised the significance of what he had seen on the old culture dishes in his lab. Florey and Chain were skilled scientists supported by a skilled team of researchers.
War	The growing casualties of WW2 added to the urgency to mass produce penicillin.
Chance	Alexander Fleming discovered Penicillin by chance in 1928.

The Discovery of DNA

- Scientists knew DNA existed from the 1800s and that it controlled what we were like (hair colour and eyes etc.).
- In 1953, two scientists in Cambridge, Francis Crick and James Watson discovered the structure of DNA.
- Watson had used the data from a female scientist Rosalind Franklin who had been the first to take X-ray photographs of a single strand of DNA. He had been shown her photographs and quickly worked out why her discovery was significant. He published his conclusion as though he had done all the investigation work. People did not take Franklin or her work seriously because she was a woman. She died in 1958 without being given much credit for her work on DNA.
- Crick and Watson proved it was present in every human cell and that it passed on information from parents to children.
- In 1986, the Human Genome Project began to identify the exact role that different genes played.

Factors leading to the discovery of the structure of DNA

Factor	Explanation
Individual genius	Francis Crick and James Watson were great scientists who were adventurous in their ideas. They were prepared to try ideas other scientists had not thought of.
Teamwork	Crick and Watson relied on other scientists e.g. Rosalind Franklin and Maurice Wilkins who was an expert in X-Ray photography. They also used skilled teams of researchers working with them.
Technology	They used the most modern technology including improved microscopes and X-ray

	photography. They also built on new knowledge in other types of science e.g. genetics and biochemistry.
Money	Both government and industry paid for the expensive equipment they used as well as the costs of employing top scientists and researchers.

Why was the discovery of the structure of DNA significant?

- The discovery and mapping of human DNA has opened up the possibility of:
 - Genetic engineering being used to cure hereditary illness such as cystic fibrosis, Parkinson's disease and diabetes.
 - Creating drugs that are specifically targeted to one person. This would prevent people being damaged by drugs that might not suit their genetic make-up.
 - Testing people for diseases e.g. cancer they may get and giving them the opportunity to change their lifestyle to prevent it being triggered.
 - Producing 'designer babies' whose appearance and intellectual ability are decided before birth.

The significance of DNA has not been fully understood yet.

The Modern Day Fight against Disease and Infection

The Value of Vaccinations

- Vaccinations have prevented people in the later 20th century from dying of diseases such as polio, whooping cough and measles. However, concerns over the connection between vaccinations and conditions like autism have meant some people have not had their children vaccinated. This has resulted in an increase of cases of measles in particular meaning children are in danger of catching and risking side effects such as blindness, deafness or death.

Medical advances on inherited illnesses

- See notes on DNA

Problem bugs and unsafe drugs

- **Superbugs** such as MRSA have become a problem for patients in hospitals causing the deaths of some patients. The superbug is resistant to antibiotics and antiseptics and the NHS has conducted a campaign to improve hygiene in hospitals in order to stamp it out.
- **Thalidomide** is an example of a drug which had unforeseen side effects. It was used between 1959 and 1962 to treat morning sickness in pregnant women. However, the drug hadn't been tested properly and the babies of mothers who took it were born with severely deformed arms and legs. About 10,000 children were affected. Some of the children that those children went on to have as adults have also been born deformed. These side effects led to future drugs being more thoroughly tested.

The World Health Organisation (WHO)

- Set up in 1948 by the United Nations.
- Aim: to help people across the world reach the highest possible standard of health by improving public health schemes in developing countries. They have recently been involved in the fight against Ebola in West African countries like Sierra Leone.
- Their greatest achievement has been the wiping out of smallpox across the world by 1980. This campaign cost £313 million but has saved hundreds of thousands of lives.

- The WHO is currently involved in the fight against HIV/AIDS as over 33 million people across the world live with it. In 2007, more than 2 million became infected for the first time with it and 2.1 million died of it. They are working particularly hard in sub-Saharan Africa as this disease has decimated whole communities in Africa with many children being left orphans because of it. In Zimbabwe, nearly 25% of the adult population are infected.
- New research suggests that Africa has been particularly badly hit because its population were not affected by the Black Death in the 1300s; a disease which seems to have given the population of Europe some level of resistance to HIV/AIDS.
- WHO's efforts have focused on educating people how to avoid catching HIV by not sharing drug needles or having unprotected sex. Prevention is the only hope as, at the moment, there is no cure.
- Transfusions of infected blood have also helped to spread the disease.

Alternative therapies

- Scientists and fans of alternative therapies disagree about how effective alternative therapies are at treating illness.
- These therapies include:
 - Acupuncture
 - Homeopathy
 - Herbal remedies
- Acupuncture – used in China for 400 years. Involves inserting fine needles at pressure points in the body to release 'blocked energy'. It has been used as an anaesthetic in operations.
- Homeopathy – Founded in Germany in the 1700s. Involves the patient taking a weak amount of a substance which would produce symptoms similar to those a patient has. It is said to encourage the body to heal itself.
- Herbal remedies – used for centuries. Examples include honey which has been used since ancient times as an antiseptic and valerian, a herb which helps people sleep.