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REVISE EDEXCEL GCSE (9–1)

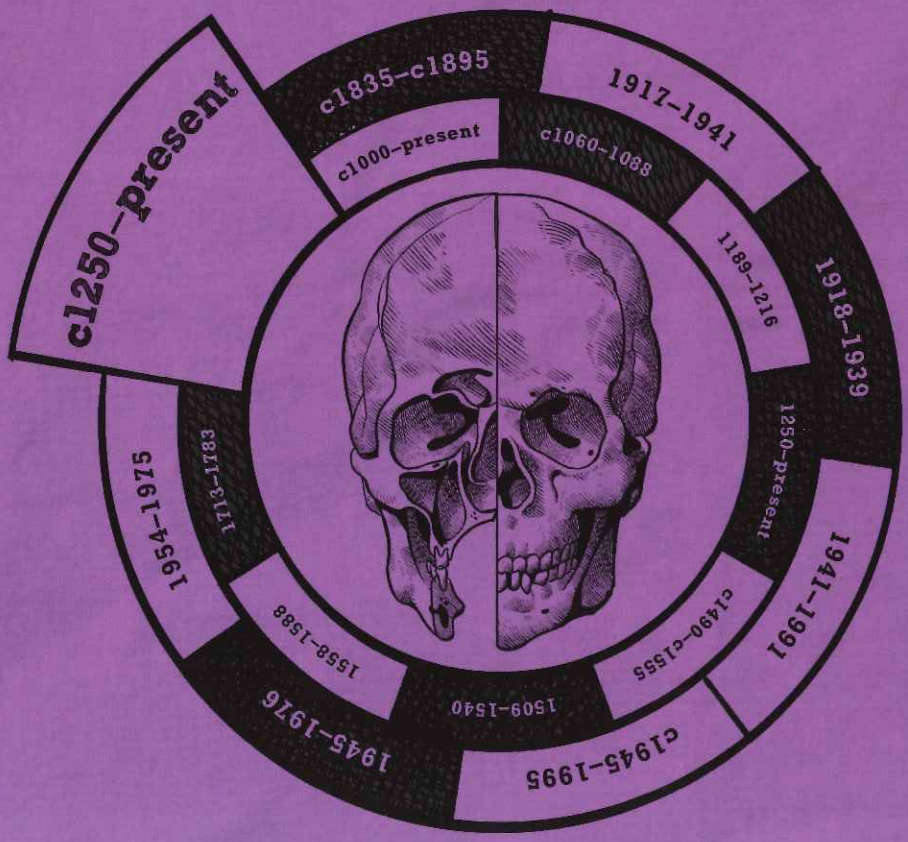
History

MEDICINE IN BRITAIN

c1250–present

REVISION

GUIDE AND WORKBOOK



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History

MEDICINE IN BRITAIN, c1250–present

REVISION

GUIDE AND WORKBOOK

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Contents

SUBJECT CONTENT

Medicine in Britain, c1250-present

c1250–c1500: The Middle Ages

1 Ideas: supernatural and religious
2 Rational explanations for disease
3 Approaches to prevention and treatment
4 Approaches to caring for the sick
5 The Black Death 1348–9

c1500-c1700: The Renaissance

6 Ideas: a scientific approach
7 Transmission of ideas
8 Continuity in prevention, treatment and care
9 Change in care and treatment
10 The Great Plague, 1665
11 William Harvey

c1700-c1900 18th and 19th Century

12 Germ Theory and microbes
13 Improvements in hospital care
14 Anaesthetics and antiseptics
15 Approaches to prevention of disease
16 Jenner and vaccination
17 Fighting cholera in London, 1854

c1900-present: Modern Britain

18 Ideas: genetics and lifestyles
19 Improvements in diagnosis
20 Change in care and treatment
21 Preventing disease
22 The development of penicillin
23 The fight against lung cancer

The British sector of the Western Front, 1914-18: injuries, treatment and the trenches

The historic environment

24 The Western Front – the trenches
25 Injuries and illnesses
26 RAMC and FANY
27 Medicine in the early 20th century
28 Medical advances

SKILLS

29 Exam overview
30 Question 1: Describing features
31 Source skills 1
32 Source skills 2
33 Question 2(a): Usefulness of sources
34 Question 2(b): Following up sources
35 Question 3: Making comparisons
36 Question 4: Explaining why
37 Question 5/6: Making a judgement

PRACTICE

38 Practice questions
55 Practice sources booklet

56 ANSWERS

A small bit of small print

Edexcel publishes Sample Assessment Material and the Specification on its website. This is the official content and this book should be used in conjunction with it. The questions in *Now try this* have been written to help you practise every topic in the book. Remember: the real exam questions may not look like this.

Ideas: supernatural and religious

The Christian Church was dominant in medieval society. Supernatural ideas were common. This impacted on people's beliefs about the causes of illness.

God and the cause of disease

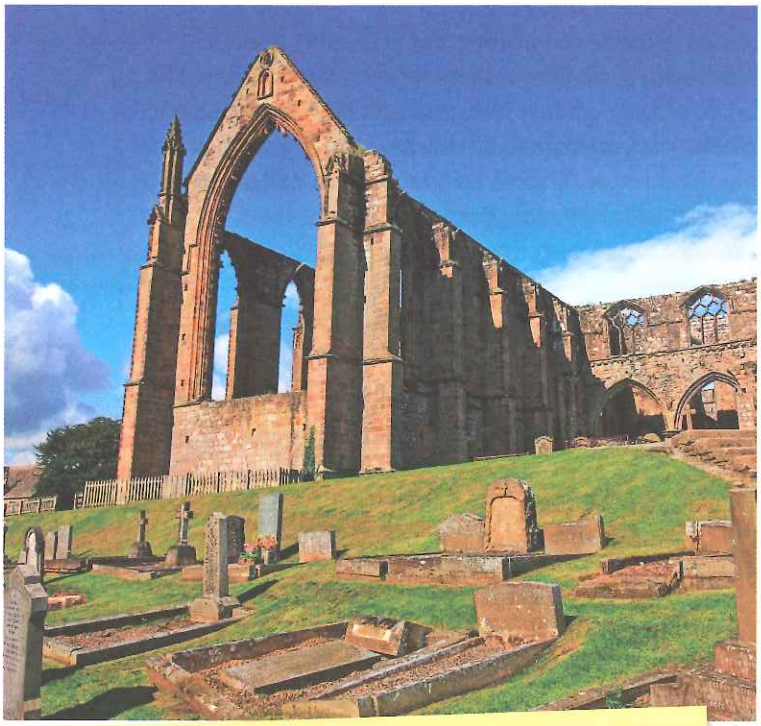
The Church taught and people believed that God made them ill because He was either displeased with them or was testing their faith. This meant that people believed that there was no need to search for other, rational explanations for disease, which held back medical research and meant that few new ideas about the causes of disease appeared in medieval times.

Astrology

- ✓ The alignment of planets and stars was thought to cause some diseases.
- ✓ Astrology was used to help diagnose what was wrong with a patient.
- ✓ Use of astrology wasn't new in 1250 but it increased through this period, especially after the Black Death when the Church became more accepting.

The Church's control of ideas

- Most of what ordinary people learned was taught by the Church. The Church was also the centre of formal learning; it set up and ran universities where physicians were trained.
- The Church discouraged dissection and in general did not approve of people challenging ideas and authority.
- Unlike most people, monks and priests could read and write. Most large collections of books were in monasteries. This meant the Church was effectively in charge of what books were read.
- The Church approved of traditional, rational explanations for disease. In particular, it promoted the ideas of Galen as his theories fitted Christian beliefs that the body had a soul and that all parts had been created by God to work together.
- The Church also taught that people should follow Jesus' example and care for the sick. Many hospitals were housed in monasteries and nunneries.



Abbeys and monasteries were increasingly important during the Middle Ages and dominated many aspects of life including medicine.

See page 2 for details on Galen's theories and page 4 for details on medieval hospitals.

Now try this

In what ways did the Christian Church **(a)** help and **(b)** hinder medicine in the Middle Ages?

Rational explanations for disease

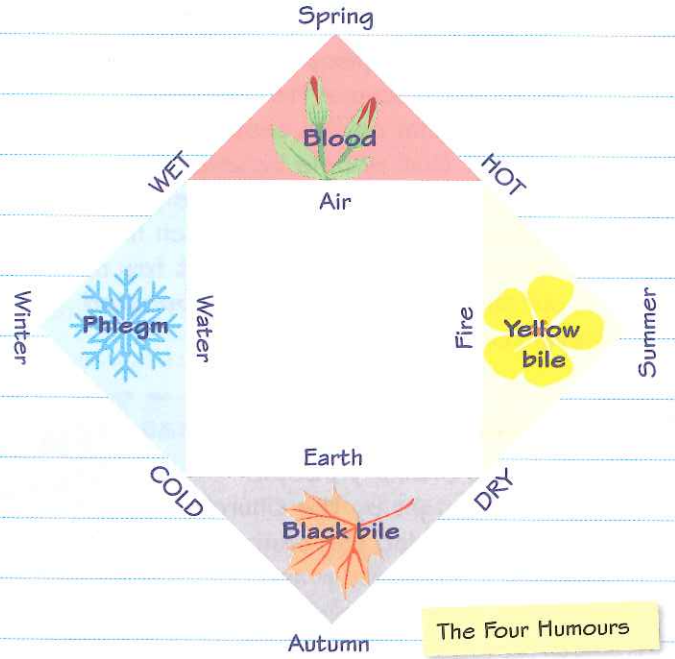
Rational explanations for disease in Medieval England were still based on ideas from the Ancient world, in particular those of Hippocrates and Galen.

The Four Humours

The Ancient Greeks thought everyone had a mix of four humours in their body. They believed people became ill when this mix was unbalanced, so to make people better they tried to put this balance right. These ideas continued well into the Middle Ages.

Theory of Opposites

In the 2nd century AD, a doctor called Galen developed the idea of the Four Humours further. Besides bleeding and purging to get rid of excess humours, treatment based on his Theory of Opposites aimed to balance the humours by giving the patient the 'opposite' of their symptoms. For example, if you had too much phlegm (linked to water and cold) you should eat hot peppers.



The Four Humours

Galen

Claudius Galen was a Greek doctor who worked in Ancient Rome. He wrote many books and his ideas were the basis of medical training in the Middle Ages. He developed Hippocrates' ideas and mainly used bloodletting, or purging, to prevent and treat illness, as well as his own treatments based on his Theory of Opposites. He also drew detailed diagrams of human anatomy using knowledge he gained from operating on wounded gladiators and carrying out dissections on dead (mostly animals') bodies.

Hippocrates

Hippocrates was an Ancient Greek doctor. His ideas and books were very influential well into medieval times and beyond. He dismissed the idea that gods caused disease – he believed there was a physical reason for illness, which needed a physical cure. Most of his treatments were based on diet, exercise and rest but he also used bleeding and purging to get rid of excess humours. He wrote the Hippocratic Oath, where doctors swore to respect life and prevent harm. His method of clinical observation – studying symptoms, making notes, comparing with similar cases, then diagnosing and treating – is the basis of the approach used today.

Miasma

Another theory about the cause of disease was that it was transmitted by 'bad air'. This was related to God because bad smells indicated sin. The theory originated in the Ancient world but continued into the Middle Ages and well into the 19th century.

Now try this

Give **four** reasons why Ancient explanations and ideas for disease dominated medicine in the Middle Ages.

Approaches to prevention and treatment

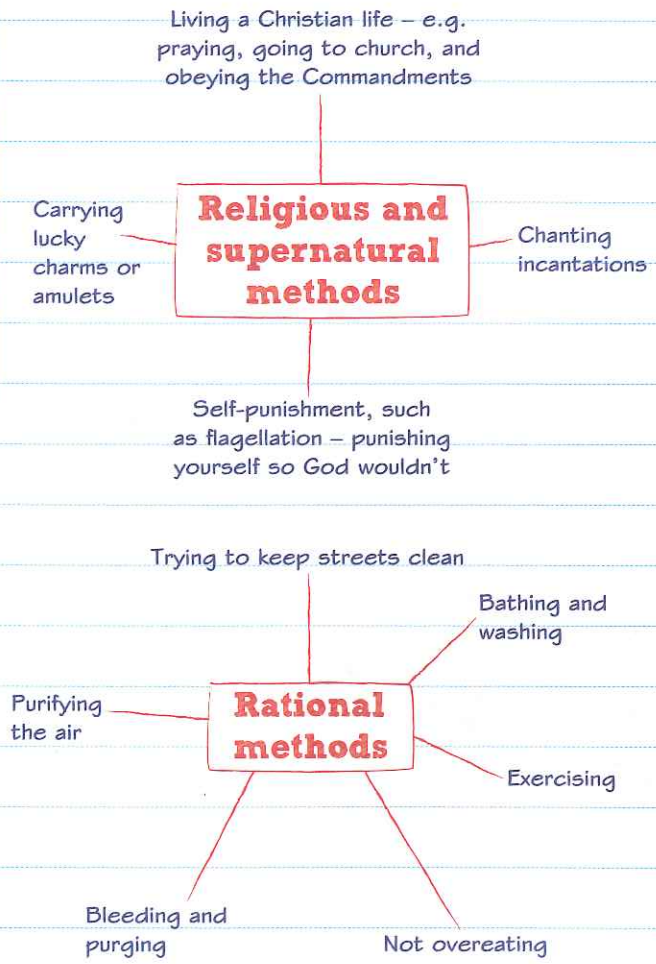
Prevention and treatment of disease in the Middle Ages was based on rational and religious methods as well as traditional remedies.

Rational treatments in connection with the Four Humours

1. Bloodletting was the most common treatment for an imbalance of humours. It was either done by cutting a vein, using leeches or by cupping. Different points in the body were used for different illnesses. Occasionally bloodletting was performed by physicians but, more usually, it was done by barber-surgeons or non-medical persons.

2. Purging was another treatment used to re-balance the humours. It either involved making a patient vomit or go to the toilet to remove food from the body. Emetics and laxatives were mixed by apothecaries, wise women or, at the patient's home, physicians prescribed treatments and sometimes gave enemas themselves.

Methods to prevent illness



Traditional remedies

The most common remedies were traditional ones made with herbs, which were drunk, sniffed or bathed in. Remedies also included different foods to rebalance the humours and ointments to apply to the skin. They were made at home or mixed and sold by an apothecary.

Religious treatments

- ✓ Praying
- ✓ Fasting
- ✓ Going on pilgrimage
- ✓ Paying for a special Mass to be said

Supernatural treatments

Supernatural treatments included specific ideas for certain illnesses, such as hanging a magpie's beak around your neck to cure toothache.

Now try this

For each of the six rational prevention methods above, explain why people believed each method would help them stay healthy.

Had a look ☐ Nearly there ☐ Nailed it! ☐

Approaches to caring for the sick

There were different people who treated the sick in the Middle Ages.

Who treated the sick?

Barber-surgeons
- No training.
- Carried out bloodletting, pulling teeth and lancing boils. Also cut hair!
- Did basic surgery such as amputating limbs (very low success rate).
- Cost less than a physician.

Care in the home
- Most ill people throughout this period were treated at home by a female family member.
- The village 'wise woman', often the Lady of the Manor, would also tend to people in their homes for free.

Apothecaries
- Received training but no medical qualifications.
- Mixed medicines and ointments based on their own knowledge or directions of a physician.
- Cost money (but less than a physician).

Physicians
- Medically trained at university and passed exams.
- Diagnosed illnesses and gave treatments, or sent patients to the apothecary or barber-surgeon.
- Expensive, so mainly used by the wealthy.
- Very few of them, with women physicians incredibly rare.

What physicians did

1. Commonly, physicians observed a patient's symptoms and checked their pulse, skin colour and urine (for both colour and taste!).
2. They consulted urine charts in their vademecum (handbook).
3. They then consulted zodiac charts to help diagnose the illness and to work out the best time to treat the patient.
4. They then either treated patients themselves (though this was rare), or sent them to a barber-surgeon or apothecary.

Hospitals

Usually, people with infectious diseases or incurable conditions were not admitted.

Many hospitals were places where travellers and pilgrims stayed on their journeys.

Patients and their surroundings were kept very clean.

Hospitals were places of recuperation rather than places where patients were treated for disease.

The number increased during the Middle Ages.

Patients were given fresh food and plenty of rest.

Many were run by the Church, so the emphasis was on God and healing souls.

Some hospitals were built for specific infectious diseases.

Now try this

List examples of people and conditions that would have been treated by each of the following: physicians, barber-surgeons, apothecaries, hospitals and the home.

The Black Death, 1348–9

Case study

The Black Death reached Britain in 1348, killing about one-third of the population. Ideas about what caused the Black Death and how it could be treated tell us a lot about how people in Late Medieval England thought about illness and disease.

What was it?

Most historians today think this disease was bubonic plague, carried by fleas living on black rats, which brought the disease to different countries on trading ships. Bubonic plague is passed to humans when an infected flea bites them and the disease enters their blood.

Causes and avoidance

How people thought the Black Death was caused	How people tried to avoid catching it
• Religion: God sent the plague as a punishment for people's sins. • Astrology: the position of Mars, Jupiter and Saturn was unusual at this time. • Miasma: bad air or smells caused by decaying rubbish. • Volcanoes: poisonous gases from European volcanoes and earthquakes carried in the air. • Four Humours: most physicians believed that disease was caused by an imbalance in the Four Humours. • Outsiders: strangers or witches had caused the disease.	• Praying and fasting: because people believed that God had sent the disease, it made sense to show God they were sorry by punishing themselves. • Clearing up rubbish in the streets. • Smelling their toilets or other bad smells, in the belief this would overcome the plague. • Lighting a fire in the room, ringing bells or having birds flying around the room to keep air moving. • Carrying herbs and spices to avoid breathing in 'bad air'. • Not letting unknown people enter the town or village.

Symptoms

Symptoms of the Black Death included:

- swelling of the lymph glands into large lumps filled with pus (known as buboes)
- fever and chills
- headache
- vomiting, diarrhoea and abdominal pain.

Treatments

Treatments for the Black Death included:

- praying and holding lucky charms
- cutting open buboes to drain the pus
- holding bread against the buboes, then burying it in the ground
- eating cool things and taking cold baths.

Now try this

Medieval people tried to prevent and cure the Black Death in many different ways. What does this tell us about what they thought caused disease?

Ideas: a scientific approach

'Renaissance' means rebirth and this period in European history saw a 'rebirth' of old ideas from Ancient Greece and Rome. People began to question, challenge and test assumptions. However, some things stayed the same.

Change in ideas on causes of disease

Gradually, throughout the Renaissance period, fewer people believed in supernatural or religious causes of disease. Various new rational explanations for disease were suggested, such as seeds in the air spreading disease. The real change in this period was the reduced influence of the Church and a scientific approach to diagnosing illness.

Continuity in ideas on causes of disease

- The theory of **miasma** continued to be believed by many to be the cause of disease. It was a particularly popular theory during epidemics.
- The Theory of the Four Humours continued to be an accepted explanation for disease, although by 1700 very few physicians still believed in it.

The changing influence of the Church

During this time new religious ideas challenged the authority of the Catholic Church, making it more difficult for the Catholic Church to promote its ideas about science. People were still very religious but they began to look for new explanations for the cause of disease, rather than believing that disease was caused by God.

Change in the work of physicians and scientists

During this period, as a new scientific approach was adopted, the way in which disease was diagnosed by physicians gradually began to improve. This was largely influenced by people like Thomas Sydenham.

- As fewer people believed that astrology caused disease, physicians stopped using astrology charts for diagnosis and timing treatment.
- Due to improved knowledge of digestion, physicians realised that urine was not a good indicator of disease and stopped using urine charts for diagnosis.
- Physicians carried out more direct observations and examinations of their patients, rather than relying on the patient explaining their symptoms.

Thomas Sydenham

Sydenham worked as a doctor in London during the 1660s and 70s. His book *Observationes Medicae* (1676) outlined his theories and observations.

- ✓ He didn't rely on medical books when making a diagnosis, but observed patients and recorded symptoms in detail.
- ✓ He was instrumental in the 'new' idea that a disease had nothing to do with the nature of the person who had it.
- ✓ He based treatment on the disease as a whole and didn't treat individual symptoms.

He became known as the 'English Hippocrates' due to his influence on doctors (mostly after his death).

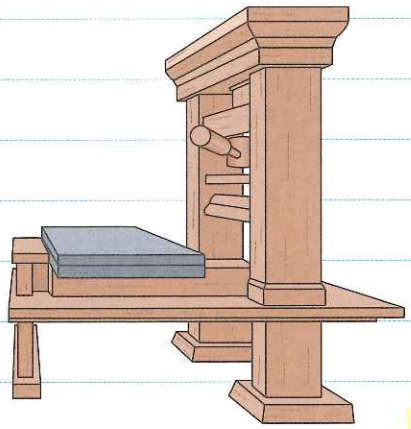
Now try this

Write a sentence explaining what happened to belief in each of the following as a cause of disease during the Renaissance: Miasma, Theory of the Four Humours, God.

Transmission of ideas

One of the major changes in the Renaissance period was in the communication and transmission of medical ideas.

The development of the printing press



The printing press, invented in 1440.

The printing press was invented around 1440 by Gutenberg. By the start of the Renaissance in 1500 there were hundreds of printing presses across Europe.

It meant that many exact copies of texts could be produced in a short amount of time.

It helped reduce the Church's control of ideas, as it could no longer prevent the publication of ideas it did not approve of.

The books, and therefore the ideas and discoveries of scientists and doctors contained within those books, could be shared more effectively and much faster across a wider area.

The setting up of the Royal Society

The Royal Society aimed to further scientific understanding by carrying out and recording the results of experiments, sharing scientific knowledge and encouraging new theories and ideas. Most significantly, it sponsored scientists to enable them to carry out research.

From 1665 the Royal Society published a journal called *Philosophical Transactions*, in which scientists could share their work and ideas. This meant that doctors and scientists could study, challenge and build on each other's research. In this way, theories could be confirmed or dismissed and news of the findings could spread through the medical community quickly.

King Charles II granted a Royal Charter to the society. He was very interested in science and his approval of the society helped it to gain credibility.

Now try this

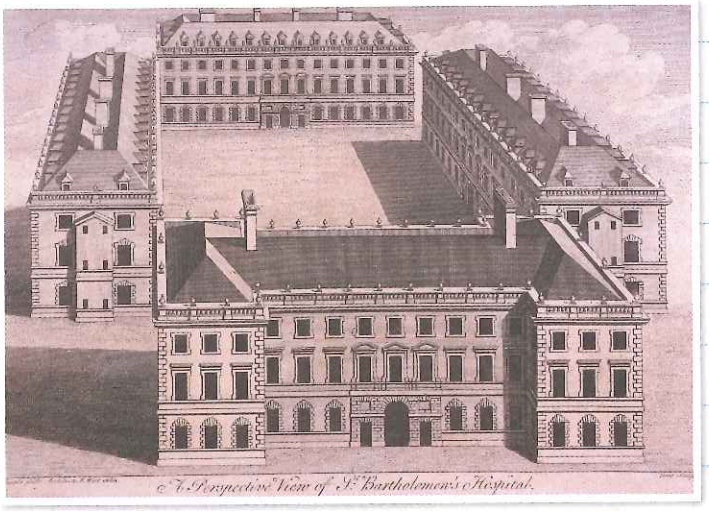
Explain how the invention of the printing press led to developments in medicine.

Continuity in prevention, treatment and care

Although there were some changes in hospital care, most treatment and preventions during the Renaissance remained the same.

Hospitals

1. By 1500, hospitals were treating more sick people and were being used less by travellers and pilgrims. Most had their own apothecary to mix medicines and physicians frequently visited patients.
2. In 1536, the dissolution of the monasteries in England by Henry VIII caused most hospitals to close.
3. Some free, charity-funded hospitals were set up but it wasn't until well into the 1700s that the number of hospitals returned to pre-dissolution levels.
4. More pest houses began to appear, where people suffering from a particular contagious disease could go for care.
5. When hospitals did re-appear, they were run by physicians focused on treating the sick rather than by religion.



St Bartholomew's Hospital

Community care

As in medieval times, most people who became ill were cared for at home, usually by a female relative. Physicians were still too expensive for the majority. Members of the community (again, usually women) helped with advice and remedies. Some were paid for their services.

Continuing treatments and preventions

- Traditional herbal remedies
- Healthy living
- Bleeding and purging
- Superstitions and prayer
- Cleanliness

Changes in prevention and treatments

- More emphasis on removing miasma through draining swamps, and removing sewage and rubbish.
- People regularly changed their clothes to keep clean rather than bathing.
- New herbal remedies from newly discovered countries appeared in England, and some were effective.
- The theory of transference led people to try and rub objects on themselves to transfer the disease to the object.
- Alchemy caused chemical cures using metals or minerals to become popular.

Lack of change

The improved knowledge and discoveries of the Renaissance had a limited impact at the time because:

- ✓ the ideas were slow to be accepted
- ✓ they had no direct use in improving treatment or preventing disease
- ✓ their discoveries did not improve understanding of the cause of disease.

Now try this

Explain why there were few totally new treatments for disease in the period 1500–1700.

Change in care and treatment

Although there was little practical change in medicine during the Renaissance, there were important changes in medical training and new discoveries made by Vesalius that led to changes in care and treatment after 1700.

Training for apothecaries, surgeons and physicians

	Apothecaries and surgeons	Physicians
Continuity	• They were still not given university training and were still considered inferior to physicians and cheaper.	• They were still trained at universities and the training lasted for many years. • Training was still based on learning from textbooks rather than practical experience.
Change	• Both were better trained through being in guild systems, where they were apprentices, then journeymen, before becoming masters. • A licence was now needed to work as an apothecary or surgeon and these were only issued after completing training.	• There was better access to a wider variety of medical books and detailed drawings due to the printing press. • Gradually, new ideas about anatomy (led by Vesalius) and causes of disease inspired some physicians to become more practical and experimental. • Dissection was legalised but took time to become commonplace.

Vesalius

Andreas Vesalius studied medicine in Paris in 1533, then became a professor of surgery in Padua, Italy. He carried out a large number of dissections on human bodies and many discoveries on how the body worked.

This drawing is taken from his most famous book, *On the Fabric of the Human Body*, which was published in 1543.

The importance of Vesalius

- He improved understanding of the human body.
- He made the study of anatomy fashionable. It became central to the study of medicine.
- He proved that some of Galen's work was incorrect, which helped encourage others to question Galen's theories.
- He encouraged and inspired other medical professionals to carry out dissections and make further discoveries.
- His work was widely published in England and throughout Europe, and included detailed illustrations of the human body, which were copied into other medical textbooks.

Now try this

List ways in which the work of Vesalius shows the differences between medicine in the Renaissance and Medieval times.

The Great Plague, 1665

Case study

The Great Plague of 1665 was the first serious outbreak of plague in England since the Black Death. There were many similarities and some differences in how people tried to treat and prevent it.

Causes

People's beliefs about the causes of the Great Plague were mostly the same as their beliefs about the causes of the Black Death. There were a few differences:

- miasma was by far the most commonly believed cause
- far fewer people believed it was caused by an imbalance in the Four Humours
- people knew that disease could be passed from person to person.

See page 5 for more details about the disease and its symptoms.

The Black Death and Great Plague

These two diseases were the same, so comparing the methods used to treat and prevent them is a useful guide to understanding what changed and what stayed the same in over 300 years of medicine. Remember to use examples from both outbreaks to show how much or how little change there had been in understanding and treating disease.

Treatments

Like its causes, many treatments for the Great Plague were similar to those for the Black Death. As most people with the disease were quarantined, little is known about treatments, though many used herbal remedies, either mixed in the home or by apothecaries, and 'quack' doctors. There were some new treatments for disease that had an impact:

- The theory of transference meant that people tried to 'transfer' the disease to something else, especially birds, such as chickens.
- It was thought that people could sweat disease out, so sufferers were wrapped up in thick blankets and put by a fire.

Government action

A real difference between 1665 and 1348 was a far greater reaction by local councils, who were ordered by the King to try and stop the plague from spreading.

- Theatres were closed and large gatherings were banned.
- Dogs and cats were killed.
- Streets were regularly cleaned.
- Barrels of tar were burned in the streets.
- Every day, carts collected the dead who were then buried in deep mass graves.
- A household was boarded into its home for 28 days or taken to the pest house if a member caught the plague.
- Days of fasting and public prayers were ordered.

Plague doctors wore costumes to prevent them catching the disease. The masks included sweet-smelling herbs to ward off miasma and the cloak was waxed so that nothing from the patient could be absorbed into it. Birds were believed to attract disease so the mask was in the shape of a bird's beak in the hope that it would cause the plague to leave the patient.

Now try this

List **six** prevention methods used to try and stop people from catching the Great Plague. For each one, explain why they did this.

Use the image to help you remember prevention methods.

William Harvey

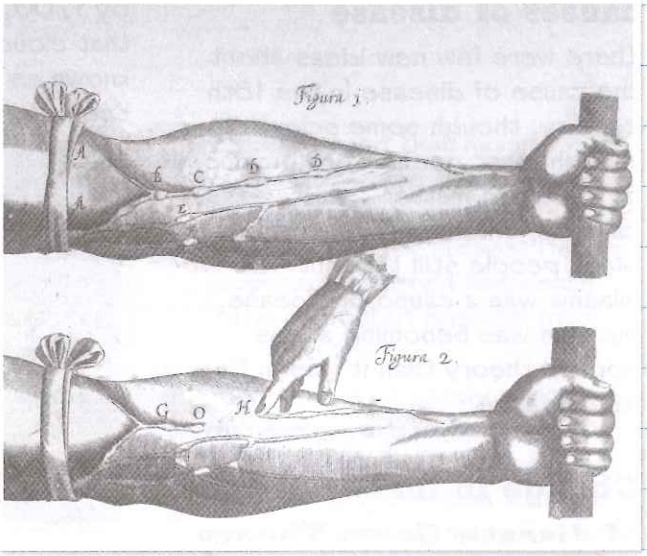
Case study

William Harvey was one of the most important individuals of the Medical Renaissance. He was influenced by Vesalius and went on to influence many others, including Sydenham.

William Harvey

William Harvey, 1578-1657

- Studied medicine at Cambridge, then Padua.
- Became a lecturer of anatomy in London at the College of Physicians.
- Was one of James I's doctors.
- Carried out public dissections.
- Taught the importance of doctors observing and recording patients' symptoms, rather than relying on textbooks for diagnosis and treatment.
- Discovered the process of blood circulation.



Harvey published his findings in *An Anatomical Account of the Motion of the Heart and Blood in Animals* in 1628, which contained detailed diagrams like this one.

Discovering the circulation of the blood

- Harvey researched Vesalius' theory that blood flowed towards the heart, which contradicted Galen's theory. He proved Vesalius was right using dissected bodies and pumps that showed blood only flowed one way.
- He then proved that blood could not be produced by the liver and absorbed into the body, as Galen had thought.
- He was influenced by new technology, such as mechanical water pumps, which made him think the human body worked in the same way.
- He discovered that arteries and veins were part of one system and that blood was pumped around the body by the heart.

The importance of Harvey

- He proved that some of Galen's theories were wrong, bringing into question Galen's other theories.
- He improved knowledge about how the body worked and passed this knowledge on. By 1700 his work was being taught in medical schools.
- As a royal physician, Harvey's work gained publicity and credibility, and inspired others to find out more.
- His scientific methods of observation and use of dissection had brought results, and so were copied by others.
- His discoveries left many unanswered questions, which encouraged further experiments.

Now try this

List the factors that were important in leading Harvey to make his discovery.

Germ Theory and microbes

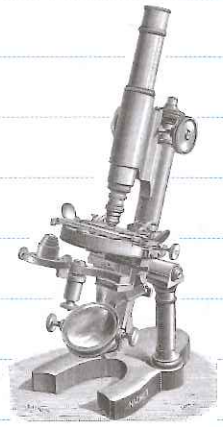
Although this period began with little change in ideas about the cause of disease, by 1900, huge breakthroughs had been made in the discovery of the true cause of many diseases.

Continuity in theory of causes of disease

There were few new ideas about the cause of disease in the 18th century, though some scientists thought that germs were produced by decaying matter – this was called spontaneous generation. Most people still thought miasma was a cause of disease, but this was becoming a less popular theory than it was in the Renaissance.

Microscopes

By 1700, microscopes had developed so that cloudy images of what would become known as bacteria or germs could be seen. By 1850, microscopes had further improved so that extremely tiny images could be seen clearly. This was essential in enabling the scientific breakthroughs of the later 19th century.



Social attitudes towards science were changing – there was an increasing awareness of the need for rational explanations for the cause of disease.

Change in theory of causes of disease: Germ Theory

In 1861, Louis Pasteur (a French chemist) published his Germ Theory, which showed that spontaneous generation was incorrect. He proved that microbes (bacteria or germs) in the air cause decay (he discovered this when investigating why liquids turned sour for the brewing industry). He theorised that germs also caused disease but was unable to prove this.

Robert Koch (a German doctor and scientist) read Pasteur's work and began to study microbes himself. He proved that Pasteur's theory was right, that microbes caused disease as well as decay. He identified the specific microbes that caused TB in 1882, and cholera in 1883.

Koch developed a new, easier way of growing bacteria on agar jelly, and also discovered that chemical dyes stained bacteria, which made them easier to see under a microscope. Other scientists used these methods to identify the microbes that caused other diseases.

Eventually, these discoveries were to have a direct impact on the prevention and cure of many diseases.

The influence of Pasteur and Koch

Pasteur's Germ Theory had very little impact on medicine in Britain to begin with as he was not a doctor and his work focused on food and drink, not disease. Most doctors still believed in the spontaneous generation theory, but there were some (e.g. Joseph Lister) who did make the link between microbes and disease.

Koch's work had more of an impact in Britain than Pasteur's had, and he inspired others to research other microbes. However, it took time for most doctors and the British government to accept the Germ Theory of disease. Even though the real cause of many diseases had been discovered, it didn't yet have an impact on their medical treatment and prevention.

Now try this

Explain **three** factors that led to the development of the Germ Theory.

Improvements in hospital care

Florence Nightingale was significant in influencing improvements in hospital care. Reports of her changes to hospital conditions after witnessing high death rates in military hospitals in the field had a significant impact on public opinion.

Florence Nightingale

1. Nursing wasn't seen as a respectable job for women and there was little training.
2. Florence Nightingale attended the first nurses' training school in Kaiserwerth hospital, Germany.
3. She was asked to lead a team of nurses at the military hospital in Scutari during the Crimean War (1854–56).

4. She believed that miasma caused disease, so emphasised hygiene, fresh air, good supplies and training for nurses. Her approach lowered the death rate at Scutari hospital from 42% to 2%.
5. Her work was widely reported in newspapers in Britain. She published books on nursing and hospital organisation and set up a training school for nurses / midwives.

Changes in hospital care

New hospitals (financed by charities and local councils) opened during the 19th century to look after the sick.

First cottage hospital (small buildings where nurses gave care and GPs prescribed to create a home treatment) opened in 1859.

Middle and upper classes could afford doctors to treat them at home.

Great Ormond Street Hospital, 1856

The elderly, sick or disabled poor were forced to enter workhouses.

Most hospitals tried to create a home atmosphere. Parents and visitors had to help nurses look after the patients.

Due to the work of reformers like Florence Nightingale, hospital cleanliness and organisation improved, and nurses were better trained. Pasteur's germ theory led to improved hygiene.

Nurses were given a more central role caring for patients and assisting doctors.

Great Ormond Street Hospital, 1875

Public pressure led to infirmaries (separate from workhouses) being set up for the poorest in society.

Specialist hospitals (such as asylums for the mentally ill and fever houses for infectious diseases) developed.

Now try this

Give **three** examples of ways in which hospitals had improved by the end of the 19th century.

Had a look ☐ Nearly there ☐ Nailed it! ☐

Anaesthetics and antiseptics

The three main problems that made surgery so dangerous were blood loss, pain and infection. The 19th century saw important developments in the management of pain and the reduction in infection.

Search for an anaesthetic

Before 1800, alcohol and opium had little success in easing pain during operations.

↓

Laughing gas was used in 1844 in dentistry in the USA, but failed to ease all pain and patients remained conscious.

↓

Ether (used from 1846) made patients totally unconscious and lasted a long time. However, it could make patients cough during operations and sick afterwards. It was highly flammable and was transported in heavy glass bottles.

↓

Chloroform (used from 1847) was very effective with few side effects. However, it was difficult to get the dose right and could kill some people because of the effect on their heart. An inhaler helped to regulate the dosage.

↓

Cocaine was used as the first local anaesthetic in 1884. In 1905 a less addictive version – novocaine – was used as a general anaesthetic.

James Simpson discovered chloroform when he was looking for solutions to pain during surgery. He gave lectures and wrote articles to promote its use for surgery and for childbirth. He was the first person to be knighted for services to medicine.

Development of antiseptics

Joseph Lister was a surgeon who worked at Glasgow Royal Infirmary.

Timeline

1861 Half the patients in surgery die from postoperative infections. Lister starts work as a surgeon.

1864 Lister reads Pasteur's Germ Theory and learns that carbolic acid kills parasites in sewage.

1865 Lister soaks bandages in carbolic acid to avoid wounds getting infected.

1866 Lister uses carbolic acid to clean wounds and equipment and invents a spray to kill germs in the air.

1867 Lister states that his wards have been free from infection (sepsis) for 9 months. He publishes his ideas.

1877 Lister becomes Professor of Surgery at King's College Hospital, London.

Aseptic surgery

Lister's work inspired others to search for methods to prevent the spread of infection in hospitals. By 1900, operating theatres and wards were thoroughly cleaned using aseptic techniques, and surgeons and nurses wore sterilised clothing and used sterilised instruments.

Opposition

People worried about the long-term effects of using anaesthetics and thought that being unconscious made patients more likely to die. The Victorians were very religious and thought that God inflicted pain for a reason, so it was wrong to interfere with His plan. Also, it took a long time for doctors and surgeons to believe in the Germ Theory and therefore accept Lister's discoveries.

The impact of anaesthetics and antiseptics

Surgery became pain free and patients didn't struggle, so surgeons could take more time and be more careful. Deeper, complex surgery became possible and the death rate dramatically decreased as surgery was more successful and infection was reduced. They also led to aseptic surgery, which reduced infections in the first place.

Now try this

Give **three** reasons why surgery was more successful by 1900.

Approaches to prevention of disease

The 19th century saw some important developments in disease prevention as the Germ Theory was used to create vaccines for some diseases. Also, the government began to play more of a role in public health and increased prevention rates by reducing the conditions that fostered disease.

The development of vaccinations

1. Pasteur published the Germ Theory of Infection in 1861.
2. Pasteur's team of scientists discovered that a weakened version of a disease-causing microbe could be used to create immunity from that disease.
3. Pasteur admired Jenner and called his new discovery 'vaccination' in tribute to Jenner.
4. Pasteur developed vaccines for animals against anthrax, rabies and chicken cholera.
5. Pasteur's work inspired other scientists to develop vaccines for human diseases.

For more on Jenner see page 16.

Reasons for the 1875 Public Health Act

Previously the government did not believe it was its role to improve living conditions and saw it as interfering in people's lives. It preferred a 'hands off', *laissez-faire* policy. During the 19th century, the attitude of government began to change due to several epidemics (especially cholera) and the increasing scientific evidence that these diseases were caused by poor living conditions. Also, the increasing number of men who could vote influenced politicians. By 1875, people recognised that it was the government's responsibility to improve living conditions in the cities.

Public Health Act, 1875

City authorities must provide:

1. clean water
2. sewers
3. public toilets
4. street lighting
5. public parks.

As well as:

1. inspect lodging houses for cleanliness
2. monitor the building of new houses to prevent damp and overcrowding
3. check the quality of food sold in shops
4. employ a public officer of health to monitor disease.

Now try this

Explain **two** reasons why the Public Health Act of 1875 was important.

Jenner and vaccination

Case study

Edward Jenner was the first to make a discovery that successfully prevented people from catching the deadly disease, smallpox.

Smallpox

In the 18th century, smallpox killed more children than any other disease. Thousands of adults died, too, and survivors were often left with terrible scars. The disease spread quickly and easily from person to person.

Jenner

Edward Jenner was born in 1749. He trained in London as a surgeon and apothecary before working at St George's Hospital. He then returned to his birthplace in Gloucestershire to work as a GP, where he made his great discovery.

Vaccination and smallpox

Since the 1720s, doctors had been inoculating people against smallpox by infecting them with a mild version of the disease. This could still kill and only the very rich could afford it.

Jenner collected evidence of the success and failure of smallpox inoculations. He regularly treated people for the mild disease, cowpox, and noticed that these people never caught smallpox.

In the 1790s, Jenner used scientific methods for carrying out experiments to test his theory and observe and record the results. He infected local people with cowpox and then tried to infect them with smallpox. None of them caught smallpox.

In 1798, the Royal Society refused to publish Jenner's ideas, so he paid to print his findings in *An Enquiry into the Causes and Effects of the Variola Vaccinae*. He included detailed instructions so that others could follow them.

By 1800, around 100 000 people worldwide had been vaccinated, but the practice took time to become popular in Britain.

In 1802, the Royal Jennerian Society was set up to promote vaccination and, by 1804, over 12 000 British people had been vaccinated.

In 1840, the government began paying for vaccinations, which were made compulsory in 1852.

In 1979, WHO, the World Health Organisation, announced that smallpox had been wiped out.

Jenner's importance

Jenner's work proved that scientific methods could lead to a disease being wiped out. He saved the lives of millions! However:

- he didn't know why it worked
- the link between cowpox and smallpox was unique, so it didn't lead to other vaccinations
- other diseases were still killing people.

Opposition to Jenner

Many people opposed Jenner's work because:

- they thought it was wrong to give people an animal's disease
- it interfered with God's plan
- doctors lost money when the government offered vaccination free
- some doctors didn't vaccinate people properly so it didn't work.

Now try this

Explain the factors that led to the success of the smallpox vaccination in reducing cases of the disease.

Fighting cholera in London, 1854

Case study

The first cholera epidemic in Britain occurred in 1831 and was followed by another in 1848–49, and another in 1854. Then a London doctor, John Snow, found what was causing the disease.

Attempts to prevent the spread of cholera

Most people, including the government, believed cholera was caused by miasma and spontaneous generation. Therefore, people tried to keep their homes as clean as possible and some local councils tried to clean the streets and clear away rubbish. The government's Public Health Act of 1848 suggested that cities should provide clean water supplies, but the Act was not compulsory so few complied.

What do we know about cholera?

- It was known as the 'blue death' as dehydration turns the skin blue.
- It mostly affected the poorest, slum areas of cities, although wealthier parts were affected too.
- It causes severe diarrhoea and vomiting leading to dehydration.
- In the early 19th century there was no treatment and most people who caught it died.

The work of John Snow

- Snow was a popular and well-respected doctor and surgeon in London. He observed the cholera epidemic of 1848–49 and began work on his theory that cholera was spread through contaminated drinking water, not by miasma.
- When cholera broke out again in 1854 in Soho, where Snow lived, he mapped all the deaths and found a strong link to one water pump on Broad Street.
- He removed the handle from the pump so people couldn't collect water from it and the number of deaths fell dramatically.
- Later it was discovered that a cesspit close by was leaking waste into the well.
- In 1855, Snow presented his findings to the government.

The significance of John Snow's work

- Many cholera deaths in Soho were prevented after Snow stopped people using the Broad Street pump.
- Many did not believe Snow's theory. He had no scientific evidence to prove cholera was transmitted in water – the Germ Theory wouldn't emerge until 1861. Therefore, the government didn't act on Snow's recommendation to build a new sewer system for London.
- In the longer-term, Snow's work combined with other evidence (e.g. The Great Stink) and a new London sewer system was completed in 1875.
- Also, in the longer-term, Snow's work helped make the link between dirty water and disease, leading to the Public Health Act in 1875 when cities' authorities were finally forced to provide clean water.

Now try this

Give **two** ways in which John Snow was significant and **two** ways in which his significance was limited.

Had a look ☐ Nearly there ☐ Nailed it! ☐

Ideas: genetics and life styles

By 1900, the correct cause of many diseases had been discovered and the knowledge had been used to produce effective vaccines to prevent certain diseases. The 20th century witnessed a search for the cause of other conditions and greater understanding of other reasons for poor health.

Understanding genetics

During the 19th century, Mendel showed how human characteristics could be passed between generations.

↓

In the 20th century new technology (electron microscopes, X-rays) let scientists analyse human cells in greater detail. They found that every cell in the body contains DNA – codes controlling the genes of each person.

↓

James Watson and Francis Crick worked together on how the genetic codes of DNA fitted together.

↓

They analysed X-ray crystallography by Maurice Wilkins and Rosalind Franklin at King's College Hospital (London) and eventually worked out the double helix structure of DNA (1953).

↓

In 1990 James Watson led the Human Genome Project and started identifying and mapping every gene in human DNA.

New possibilities

Discovering the structure of DNA and the work of the Human Genome Project has led to:

- 👍 a better understanding of some genetic conditions, such as Down's syndrome
- 👍 predicting whether individuals are at higher risk of developing some cancers
- 👍 the discovery that stem cells can be grown into different cells.

However, there is not yet a:

- 👎 cure or effective treatment for most genetic conditions
- 👎 way of preventing most genetic diseases.

Understanding of lifestyle factors

Since 1900, people have discovered that some lifestyle factors can negatively affect health and increase the chance of contracting disease.

Smoking
Research now links smoking with many diseases, such as emphysema, high blood pressure, heart disease and many cancers.

Drinking alcohol
Research now links drinking too much alcohol to many cancers, as well as liver and kidney disease.

Diet
Scientific research has confirmed that eating a balance of different foods and limiting sugar and fat reduces the chances of getting certain types of cancer or heart disease.

Now try this

The discovery of DNA is important for medicine. Give **three** reasons why.

Improvements in diagnosis

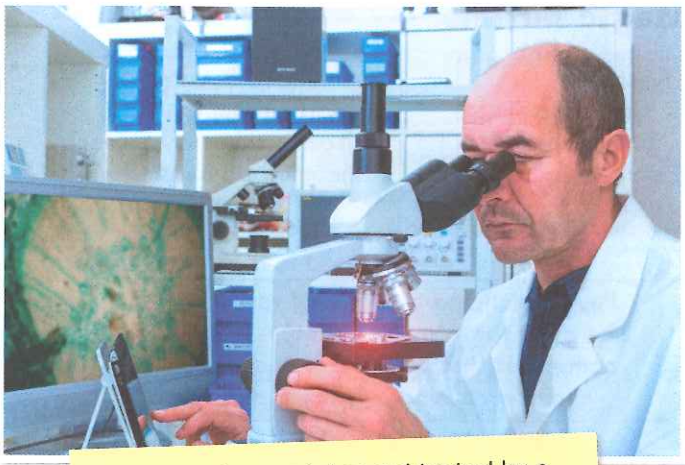
Developments in science and technology in the 20th century have improved the diagnosis of illness and the cause of disease.

Improvements in diagnosis

The 20th century saw huge changes in the ways that doctors diagnosed illness. Although doctors today still use their own knowledge and medical books, they combine this with medical testing, using science and technology to discover what is wrong. This includes the use of:

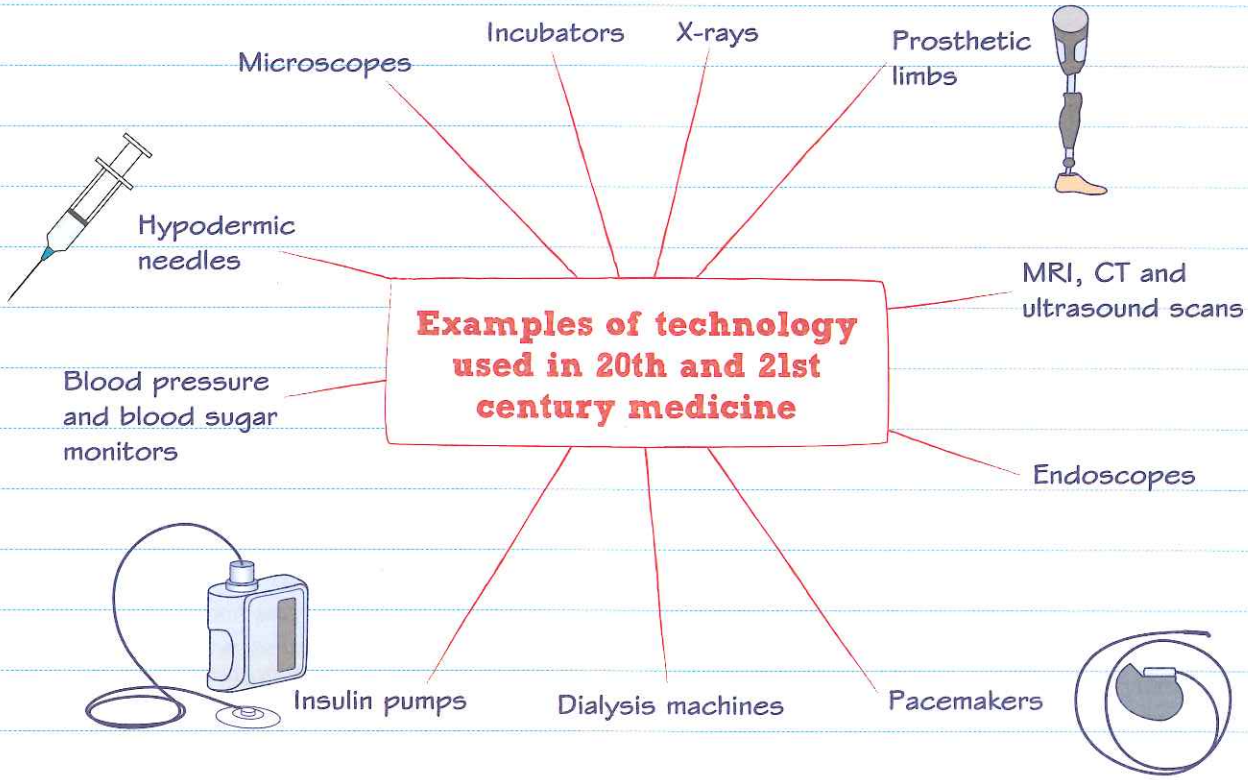
- laboratories to test skin or blood
- x-rays, scans and endoscopes to 'see' inside the body with more clarity than ever before
- monitors to see what is going on over a period of time.

Improved scientific understanding and technology has made diagnosing disease far more accurate.



Blood samples are taken and tested by a pathologist in a laboratory. Analysing blood means that a huge number of diseases are now diagnosed and monitored without the need for surgical investigation.

Medical technological advances



Now try this

Give **three** methods used to diagnose illness in the period 1900 to the present day.

Had a look ☐ Nearly there ☐ Nailed it! ☐

Change in care and treatment

The 20th century saw major advances in treatments from new 'miracle' drugs that cured diseases to advanced surgical treatments, which solved other problems.

Magic bullets

Koch discovered that different chemical dyes stained specific microbes.

Behring discovered the body manufactures antitoxins that only attack the microbe causing a disease.

Paul Ehrlich and his team of researchers searched for a 'magic bullet' – a chemical compound that would attack and kill the microbe causing a specific disease.

The team, helped by German government funding, worked for many years. They tested many compounds of Salvarsan to find one to cure syphilis.

In 1909, Dr Hata joined the team and discovered they had rejected a compound that worked – the 606th!

In 1932, Gerhard Domagk developed the second magic bullet, Prontosil, which cured some types of blood poisoning.

Other scientists checking Domagk's work found that the key ingredient in Prontosil, sulphonamide, also cured pneumonia, scarlet fever and meningitis.

Antibiotics

- Antibiotics destroy bacteria or prevent its growth. The first to be discovered was penicillin.

See page 22 for more about penicillin.

- Scientists, inspired by the discovery of penicillin, experimented with other moulds and found more antibiotics that were effective against different diseases throughout the 1940s, 50s and 60s.
- Once the chemical structure of different antibiotics was discovered, scientists were able to make antibiotics, which solved the problem of having to grow them first in order to amend them to treat further diseases.
- Antibiotics have saved and extended millions of lives but due to overuse, super-bacteria, which are resistant to antibiotics, have evolved.

Using examples

Where possible, always use specific examples to demonstrate your knowledge. Examples of high-tech medical and surgical treatments include:

- ✓ radiotherapy and chemotherapy
- ✓ kidney dialysis
- ✓ fitting pacemakers
- ✓ organ transplants.

Advances: keyhole and microsurgery

With the development of tiny cameras and surgical instruments, surgeons can use small incisions instead of large cuts to access the body, which reduces patients' recovery time. The small instruments also make it possible to reattach nerves and blood vessels.

Advances: robotic surgery

Some surgery can now be carried out remotely, with surgeons controlling robots through computers. This has also made surgery more precise.

The final major problem of surgery, blood loss, had also been solved, which led to successful blood transfusions. See page 27 for more on blood transfusions.

Now try this

Describe the factors that made the advances in treatments since 1900 possible.

Preventing disease

In the 20th century, government intervention has improved access to healthcare and prevention of disease.

The NHS

Since 1948, taxes have funded a wide range of healthcare provided by the National Health Service, such as:

- ✓ seeing a GP
- ✓ hospital care and operations
- ✓ health visitors for pregnant women and young children
- ✓ ambulances and emergency treatment
- ✓ health care for the elderly.

Healthcare on the NHS

Improved access to care

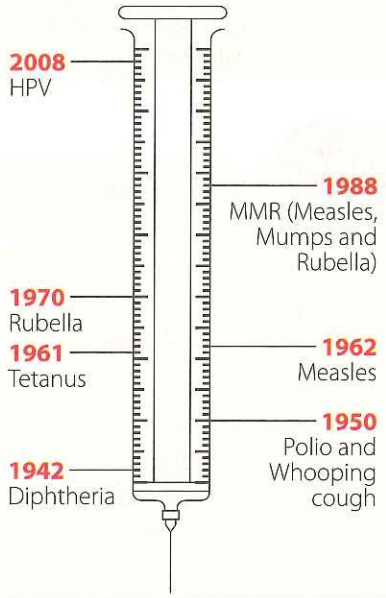
The establishment of the NHS improved access to healthcare because all treatment was entirely free, so everyone could access the same care. However, healthcare provision was unequal across different parts of the country, both in terms of the number of doctors and hospitals and their standards, and this took time to improve.

Some types of healthcare are still difficult to access. For example, few people receive NHS dental treatment due to a lack of NHS dentists. In general though, far more people access healthcare today than in 1900.

Compulsory vaccinations

Although many vaccines that successfully prevented some diseases had been developed in the late 19th and early 20th centuries, people had to pay to receive them and many could not afford to do so. In 1938, 3000 people died in a diphtheria epidemic, which led to a government-funded immunisation programme. This has been followed by many others. Vaccination is still controversial, however, and some people choose not to have their children vaccinated.

Timeline



Prevention measures

Since 1948, the government has taken more action to prevent people getting ill.

- Funding more testing and vaccinations.
- Better disposal of rubbish and sewage.
- Laws reducing air and water pollution.
- Laws banning the advertising of cigarettes and smoking in public places.
- Laws improving health and safety at work.
- Environmental health officers inspecting food outlets.

Lifestyle campaigns

Since 1948, the government has funded publicity to raise awareness of illnesses and dangers to health, such as smoking and binge-drinking, with some success: the 1980s 'AIDS: don't die of ignorance' campaign reduced cases of HIV infection.

More recently, events and initiatives such as the Change4Life campaign, have encouraged healthy behaviour to prevent disease.

Now try this

Give reasons why, on average, people live much longer in Britain today than in 1900.

Had a look ☐ Nearly there ☐ Nailed it! ☐

The development of penicillin

Case study

The first antibiotic to be discovered and developed was penicillin.

Discovery of penicillin

In 1928, Alexander Fleming noticed that bacteria in a Petri dish was being killed by a penicillium mould. He tested it on other bacteria and discovered that the mould produced an excellent antibiotic (penicillin).

In 1929, Fleming published his findings but did not believe that penicillin would work on living people and had no funding to continue his research.

Several years later, Howard Florey, Ernst Chain and their team continued Fleming's research on penicillin.

It proved effective on mice, so they tested it on humans. Penicillin killed bacteria and therefore the infection – it was a miracle drug!

Alexander Fleming

Fleming worked on the battlefields of the First World War. Part of his job was to study soldiers' infected wounds and try to find treatments. Many died from their infections. After the War, he worked at St Mary's Hospital in London, where he continued his work to try to find a way of healing bacterial infections.

Howard Florey and Ernst Chain

Florey was an Australian pathologist who was researching ways to kill bacteria at Oxford Medical School. He assembled a group of scientists to help him. One of his first recruits was the German biochemist, Ernst Chain. They, together with Fleming, won the Nobel prize in Physiology or Medicine, in 1945.

Timeline

- **1928** Fleming recognises that mould kills bacteria.
- **1929** Fleming publishes his findings.
- **1939** Florey and Chain continue Fleming's research.
- **1940** Penicillin proves effective on mice.
- **1941** US drug companies agree to help fund the production of penicillin. Penicillin proved effective on humans. In December the USA enters the Second World War.
- **1942** Mass production of penicillin by US drug companies financed by US government.
- **1943** Mass production of penicillin by UK drug companies.
- **1945** Crowfoot Hodgkin identified penicillin's chemical structure.
- **1951** First chemical copy of penicillin created.

Mass production

Penicillin still wasn't used for medical treatment because huge amounts were needed to treat one person, and growing the mould took time and lots of space and was therefore expensive.

1. Florey asked UK drug companies and factories to help, but these were being used for the war effort.
2. In 1941, Florey asked US drug companies. Some agreed to help but on a very small scale.
3. The effectiveness of penicillin was demonstrated.
4. After the USA joined World War Two, the government saw the need for more penicillin to treat casualties and funded 21 companies to mass-produce it.
5. US drug companies began mass production of penicillin in 1942 and British drug companies did so in 1943.

Now try this

Explain the factors that led to the development of penicillin.

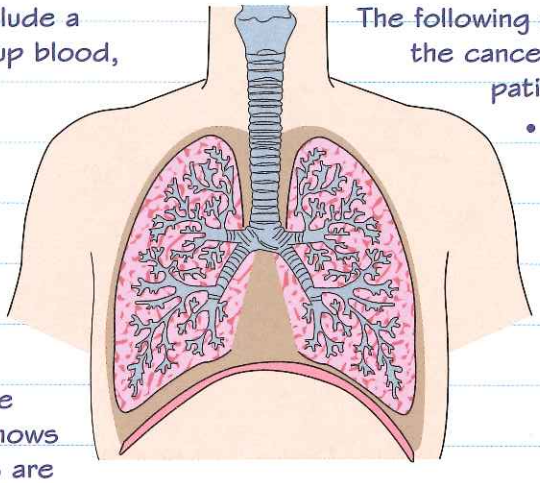
The fight against lung cancer

Case study

The 20th century saw a huge rise in the number of lung cancer cases. Today, it's the second most common cancer in the UK and has a poor survival rate compared with other cancers because it's difficult to diagnose and treat. The majority of lung cancers are caused by smoking or passive smoking, though some people develop lung cancer for no apparent reason.

Diagnosis

Symptoms of lung cancer include a persistent cough, coughing up blood, breathlessness, tiredness, unexplained weight loss and repeated chest infections, but these can be symptoms of many other conditions, too, and the cancer is often very developed when symptoms show up. If lung cancer is suspected, most patients are given a CT scan and if this shows a mass, a sample of the cells are collected and tested.



Treatment

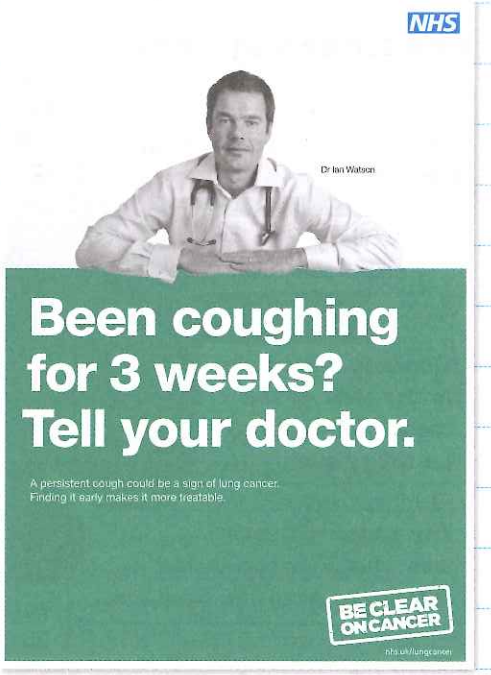
The following are treatments that can cure the cancer or prolong the life of the patient.

- Surgery to remove the tumour or carry out a lung transplant.
- Radiotherapy to try to shrink the tumour or prevent its growth.
- Chemotherapy to try to shrink the tumour, or prevent the cancer returning.

Prevention

The UK government has tried various methods to reduce the number of people smoking, to prevent them developing lung cancer.

- TV advertising for cigarettes was banned in 1965, and for cigars and tobacco in 1991. All forms of advertising have since been banned.
- Tax on tobacco products is regularly increased to make smoking more expensive and to encourage people to stop.
- In England in 2007, smoking was banned in public places where people worked and this ban was extended in 2015 to cars carrying under-18s.
- In 2007, the legal age for buying tobacco products was raised from 16 to 18.
- Various campaigns have been funded to educate people about the risks of smoking, to encourage them to stop or not to start.
- Today, shops are not allowed to publically display tobacco products.
- Cigarette packaging became standardised in May 2016, all cigarettes are sold in green packets and with graphic warnings of the dangers, whatever the brand.



Now try this

Give **three** ways in which the government has tried to prevent lung cancer.

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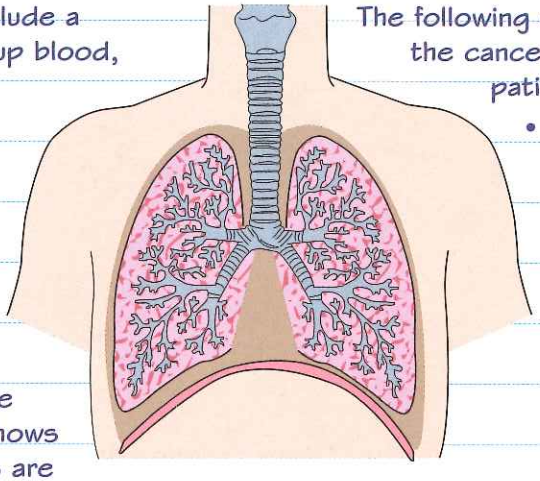

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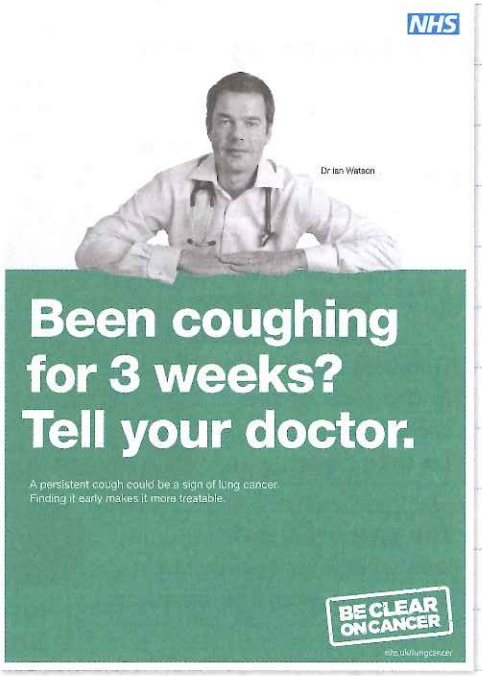


Now try this

Give **three** ways in which the government has tried to prevent lung cancer.

The Western Front – the trenches

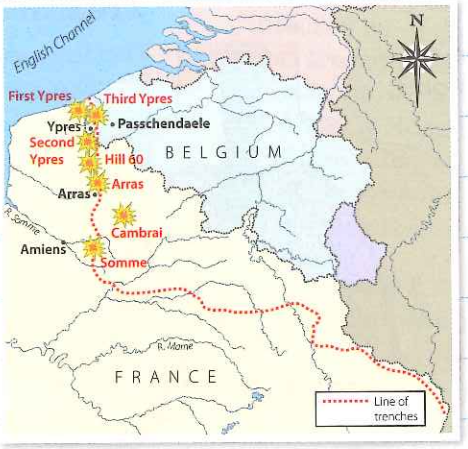
Britain declared war on Germany on 4 August 1914, and sent troops to northern France to stop the German advance through Belgium. By the end of the year, fighting was restricted to a line of trenches that stretched through Flanders and northern France, from the English Channel to Switzerland. This was known as the Western Front.

Battles on the Western Front

First Battle of Ypres, October–November 1914
The British managed to hold on to Ypres, which was vital in maintaining access and control of the English Channel ports, but the Germans gained ground.

Battle on Hill 60, April 1915
The British tunnelled into and under the hill and exploded five mines from the tunnels, which enabled them to take the hill.

Second Battle of Ypres, April–May 1915
The Germans made very slight gains towards Ypres. The battle was notable as being the first time chlorine gas was used. It was first used by the Germans.



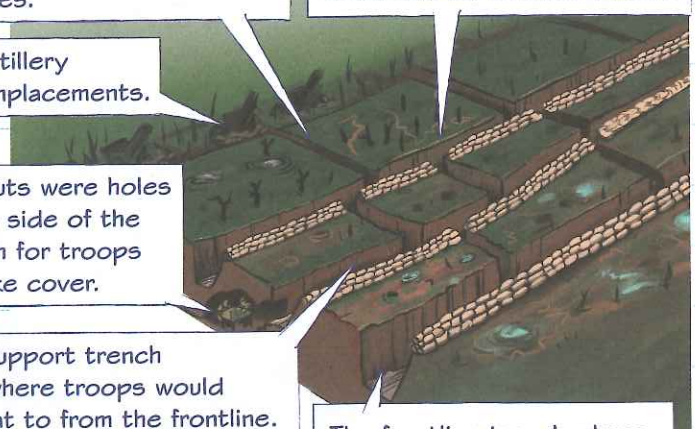
Third Battle of Ypres, July–November 1917
The British used a creeping barrage to make small gains to break out of the Ypres Salient. The awful weather left the ground waterlogged and many drowned.

The Somme, July–November 1916
Notable for the extremely high casualties on both sides, the battles on both sides of the River Somme saw two new strategies by the British – the creeping barrage and the first use of tanks – but these had little impact.

Arras, April–May 1917
In 1916, the British linked and expanded the underground tunnels, quarries and caves for the shelter and movement of troops. The tunnels were used to launch the battle, which was initially successful but ended with little progress and high numbers of casualties on both sides.

Cambrai, November–December 1917
This battle was notable for the first large-scale use of tanks, which were successful but were not backed up so the British were forced back.

The trench system



All three rows of trenches were linked by communication trenches.

The reserve trench was where troops could be stationed for counter attack.

Artillery emplacements.

Dugouts were holes in the side of the trench for troops to take cover.

The support trench was where troops would retreat to from the frontline.

The frontline trench where attacks were launched.

Trenches formed a zig-zag pattern.

Trench construction

The first trenches were hurriedly dug by troops. They often used existing ditches or banks to make it easier. The trenches were constantly maintained and improved, for example, with drains and steps added.

Terrain and transport

Terrain varied in different places and according to weather conditions. It could be very difficult to get around where there was deep mud and waterlogging, and craters and holes from explosions. The trenches themselves could be muddy and very crowded.

Now try this

From the following list, select the resources you think would be helpful in finding out about a First World War battle's terrain and conditions: maps, photographs, national newspapers, government reports, army records, hospital records, personal letters.

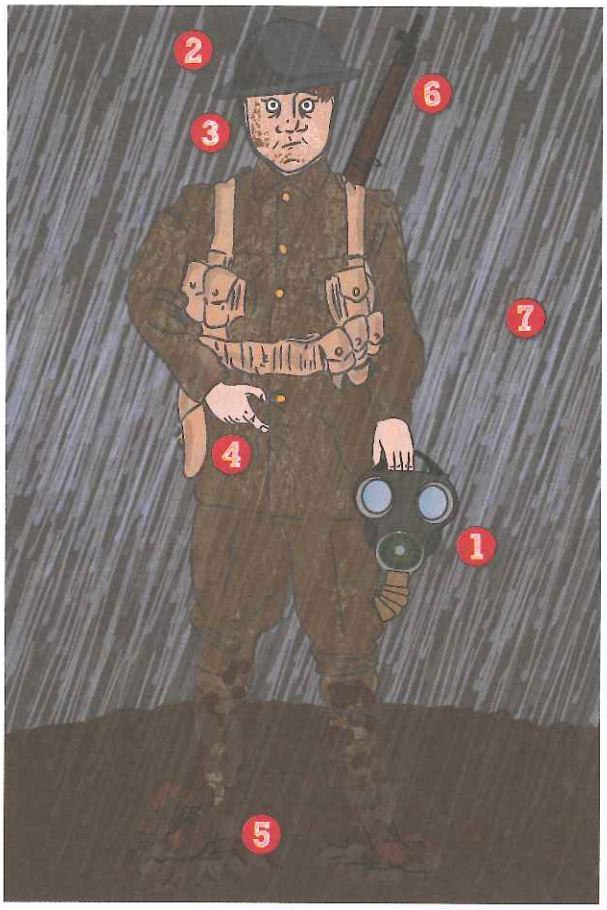
Injuries and illnesses

British soldiers on the Western Front were at risk of death and injury from rifles, machine guns and explosives, but also from illnesses caused by the conditions in which they were living and fighting.

1 **Gas attacks** were greatly feared but were not a major cause of death. They caused (mostly temporary) blindness and coughing, and also burns. In July 1915, gas masks were given to all British troops. Before this, they protected their faces with cotton pads soaked with urine.

2 **Head injuries** were unexpectedly common and were mostly caused by shrapnel. By late 1915, the soldiers' soft caps were replaced by Brodie helmets, which reduced head wounds.

3 **Shell shock** caused a wide range of symptoms, including total mental breakdown. Some sufferers were accused of cowardice. Many were treated close to the Front but some were evacuated to British hospitals.



4 **Trench fever** produced flu-like symptoms, which could last for months and keep reoccurring. It was caused by lice so, in 1918, troops were deloused, which reduced cases.

5 **Trench foot** was caused by standing in waterlogged trenches. It could lead to gangrene, treated with amputation. To try and protect troops' feet, they were given whale oil and spare socks, pumps were used to drain trenches, and duckboards were added for soldiers to keep their feet above the water.

6 **Bullets** from rifles and machine guns could penetrate organs and fracture bones.

7 **High-explosive shells and shrapnel** were responsible for most deaths and injuries, removing limbs and causing major internal injuries.

Specific injury problems

Some injuries had rarely been seen before, while others had never been seen on this scale. All weapons, but particularly explosions, could cause major blood loss. Bullets and shrapnel had to be located and then removed. Extensive head wounds required brain surgery and/or facial reconstruction.

Wound infection

This was a major problem as soil on the Western Front contained tetanus and gas gangrene bacteria. These would enter wounds either during attack, or when victims were lying on the ground (often for some time) before being collected. From late 1914, tetanus injections were given but there was no prevention for gas gangrene.

Now try this

Explain **one** way in which there was an attempt to prevent: a) illness on the Western Front b) injury on the Western Front.

RAMC and FANY

With so many casualties and with the battle being miles away from towns and hospitals, it was important to have medical facilities in the field. The stages of treatment (also known as the 'chain of evacuation') for the wounded evolved as the war went on. The Royal Army Medical Core (RAMC) and First Aid Nursing Yeomanry (FANY) provided the majority of the medical care.

Medical workers

Initially, all medical workers were from the RAMC but later, volunteers were allowed, from, for example, FANY. The volunteers were mostly used to drive ambulances and for cooking and cleaning.

Underground hospital at Arras

Also known as Thompson's Cave, the hospital was very close to the front line in the tunnels underneath the town. It included space for 700 beds, an operating theatre and a mortuary. It was supplied with running water and electricity.

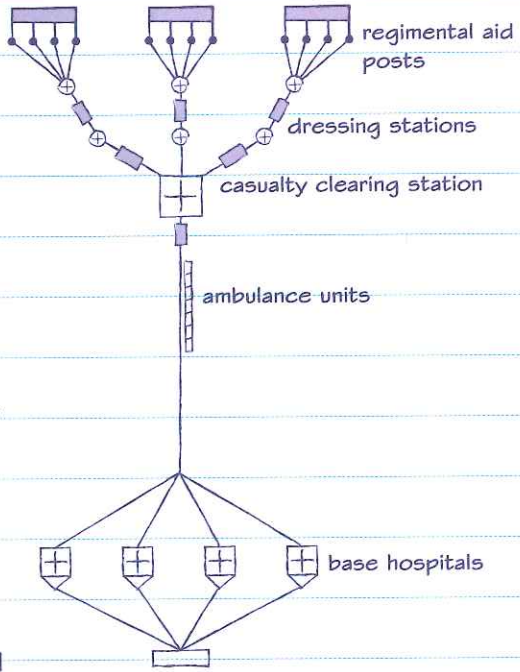
Transport problems

- Difficult terrain meant that in some places only stretcher-bearers and horse wagons could be used.
- Many roads and railway lines had been destroyed.
- Constant shelling and artillery fire made recovery of the injured very difficult.
- Initially, no motor ambulances were sent and there were not enough horses to cope. Public appeal in Britain raised money for 512 motor ambulances.

For more about terrain, see page 24.

Chain of evacuation

1. The **Regimental Aid Post** was close to the front line. The Regimental Medical Officer was helped by stretcher-bearers in administering first aid. He sent more serious injuries on to the next stage.
2. The **Field Ambulance** was a mobile medical unit of the RAMC, which set up **dressing stations**. They were about a mile back from the front line in derelict buildings, dugouts or tents. These stations were staffed by medical officers, orderlies and stretcher-bearers and, from 1915, some nurses. They could look after men for a week. Serious cases were sent straight to the CCS.
3. **Casualty Clearing Stations** were larger and better equipped, were situated in buildings several miles from the front line, and were staffed by doctors and nurses who prioritised treating life-threatening injuries to men who had a chance of survival. They became the most important place for efforts to reduce risk of infection until March 1918, when base hospitals regained that role.
4. **Base hospitals** were situated near ports on the coast. They had many medical staff, including doctors who specialised in certain treatments. Patients could stay for some time before returning to the front or being sent home by ship for further treatment.



Now try this

Describe **two** features of each of the four stages in the 'chain of evacuation'.

Medicine in the early 20th century

You need to know three important developments in medicine in the early 20th century, as these were the basis for medical treatment and improvements during the First World War.

X-rays

In 1895, when Wilhelm Roentgen covered a test tube in black paper he was surprised to find that rays from the tube lit up a screen. He experimented and found that these rays could pass through many objects, including human flesh but couldn't pass through bone. He then put photographic paper between the tube and his hand to create the first x-ray image. Radiology departments opened the following year and were used to diagnose embedded objects and bone problems.

Problems with early x-rays:

- photography was at an early stage so taking x-rays required keeping still for a long time
- high doses of radiation were released and patients were burnt and lost hair
- large machines were too heavy to be moved easily.

Blood transfusions

In the 17th century, doctors carried out blood transfusions from animals to humans but people rarely survived.

James Blundell performed the first human-to-human blood transfusions between 1818 and 1829. He developed useful techniques and equipment but there were problems. Blood had to be transferred directly from the donor to the recipient as it couldn't be stored, and only about half the recipients survived.

In 1901, Karl Landsteiner discovered three blood groups and, in 1902, his colleagues found a fourth group. They discovered that transfusions would work only between people of the same blood group.

Aseptic surgery

Thanks to the work of Joseph Lister, antiseptic surgery was well established by 1900 and aseptic conditions began to be used.

For more on aseptic conditions, see page 14.

Operating theatres and wards were thoroughly cleaned.

Surgeons and nurses wore sterilised clothing.

Sterilised cloths covered surfaces and equipment.

Surgeons and nurses wore masks to prevent breathing infection into a wound.

An operating theatre at St Bartholomew's hospital, London around 1920.

In 1878, Robert Koch developed a steam steriliser for surgical instruments. After 1887, all surgical equipment was sterilised.

In 1890, anyone touching the patient wore rubber gloves to stop germs passing from their hands to the wound or onto instruments they were using.

Now try this

1 Give **one** way in which each would be useful in treating injuries during a war: x-rays, blood transfusions, aseptic surgery.

2 Give **one** way in which there would be problems using each discovery in a war environment.

Medical advances

The type and extent of injuries on the Western Front led to experimental techniques to treat wounds and deal with infections. By 1918, many advances in medicine and surgery had been made.

New techniques for infections

Antiseptic and aseptic surgery was not possible in Dressing Stations and Casualty Clearing Stations, and many wounds were already infected by the time the patient was operated on.

↓

Surgeons went back to using chemicals to kill bacteria but this didn't work against gas gangrene.

↓

By 1917, the Carrel-Dakin method, in which sterilised salt solution was moved through the wound using tubes, was found to be more effective.

↓

This didn't work when infections were very deep in the body, so surgery was developed to remove the damaged and infected tissue as well as removing all traces of the bullet or shrapnel.

↓

If this didn't work, the only remaining way to save the patient was to amputate the limb.

Blood transfusions

Blood loss could lead to shock which often caused death. Blood transfusions were used from 1915 but were limited as blood could not be stored.

↓

In 1915, Richard Lewisohn found that adding sodium citrate to blood stopped it clotting, so it could be stored a short time. Richard Weil used refrigerators to store it for much longer.

↓

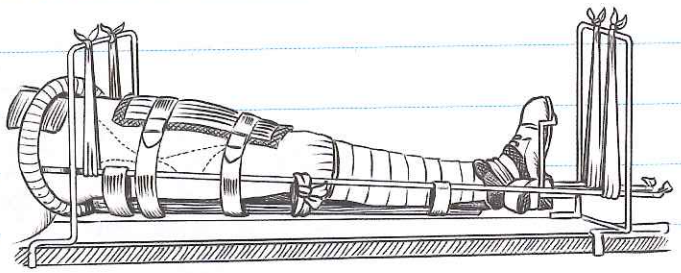
In 1916, Francis Rous and James Turner added citrate glucose, which meant blood could be stored even longer.

↓

In preparation for the Battle of Cambrai in 1917, Oswald Hope Robertson stored 22 units of blood in what he called the first 'blood depot'. He used it to treat Canadian soldiers suffering from shock and demonstrated its potential.

The Thomas Splint

From December 1915, the Thomas Splint was widely used and reduced the death rate from broken limbs to fewer than 20%. This was because the splint kept the leg rigid which reduced blood loss. Previously, 80% of soldiers with broken legs died.



Advances in surgery

The number of brain injuries during the war led to the development of new surgical techniques and improved the success rate. The large number of facial injuries led to huge improvements in plastic surgery, led by Harold Gillies who worked at the Queen's Hospital in Kent.

Mobile x-ray units

X-rays were essential in locating bullets and shrapnel before operating. Static machines were used in base hospitals from 1914 and in some Casualty Clearing Stations. Mobile units were used closer to the front and their numbers increased as the war went on. Their images were not as clear as those from the static machines but still prevented many deaths.

Now try this

Describe how the following problems were treated by medical staff on the Western Front: wound infection; blood loss; broken legs; removing shrapnel and bullets.

Exam overview

This page introduces you to the main features and requirements of the Paper 1 Option 11 exam paper.

About Paper 1

- Paper 1 is for both your thematic study (section B) and your study of a historic environment (section A).
- Section A will be on The British sector of the Western Front, 1914–18: injuries, treatment and the trenches.
- Section B will be on Medicine in Britain, c1250–present.
- You will receive two documents: a question paper, which you write into, and a sources booklet, which you will need for some questions in section A.

The Paper 1 exam lasts for 1 hour 15 minutes (75 minutes) in total. You should spend about 25 minutes on the historic environment and 50 minutes on the thematic study.

You can see examples of all questions on pages 30–37, and in the practice questions on pages 38–54.

The questions

The questions in Paper 1 will always follow this pattern.

Section A: Question 1

Describe **two** features of … **(4 marks)**

Question 1 targets AO1. AO1 is about showing your **knowledge** and **understanding** of key features and characteristics of the topic.

Section A: Question 2(a)

How useful are the sources for an enquiry into …?

Explain your answer using Sources A and B and your knowledge of the historical context. **(8 marks)**

Question 2(a) targets AO3, which is about analysing, evaluating and using sources to make substantiated judgements. This is where you show your ability to **analyse** and **evaluate** the usefulness of **sources**.

Section A: Question 2(b)

How could you follow up Source [A/B] to find out more about …?

Complete the table, giving the question you would ask and the type of source you could use. **(4 marks)**

Question 2(b) also targets AO3. This is where you show your ability to use **sources** to frame historical questions.

Section B: Question 3

Explain **one** way in which … was similar to/ different from… **(4 marks)**

Question 3 targets both AO1 and AO2. AO2 is about explaining and analysing key events using historical concepts such as causation, consequence, change, continuity, similarity and difference. This question focuses on **change** and **continuity** across two periods of time.

Section B: Question 4

Explain why… **(12 marks)**

Two prompts and your own information.

Question 4 also targets both AO1 and AO2. It focuses on causation: explaining why something happened.

Section B: Question 5 or 6

'Statement' and How far do you agree? Explain your answer. **(16 marks)**

(+ 4 marks SPaG and use of specialist terminology)

Two prompts and your own information.

You have to answer either question 5 or question 6. These target both AO1 and AO2 and you need to make a **judgement** in this question. Up to 4 marks are available for spelling, punctuation, grammar (SPaG) and use of specialist terminology.

Question 1: Describing features

Question 1 on your exam paper will ask you to 'Describe **two** features of...'. There are 4 marks available for this question: two for each feature you describe.

What does 'describe' mean?

Describe means that you must give an account of the main characteristics of something. You develop your description with relevant details, but you do not need to include reasons or justifications.

Worked example

Describe **two** features of the trenches that led to ill health. **(4 marks)**

Sample answer

Feature 1

There was a vast network of trenches stretching from the English Channel to Switzerland. They were dug a couple of metres into the ground and were quite narrow.

Feature 2

The trenches were often very crowded with people and equipment. They also got very wet and muddy after it rained, as there was little drainage to get rid of the water.

Links You can revise illnesses in the trenches on page 25.

Make sure you read the question – it's asking for features of the trenches that led to ill health not just features of the trenches.

These features are relevant but the answer doesn't explain how they led to ill health.

Improved answer

Feature 1

Trenches got very wet and muddy, as there was little drainage to get rid of the water. This led to problems, such as trench foot, as people's feet were constantly wet and became numb and swollen. This could eventually lead to gangrene.

This improves Feature 2 from above by taking one thing – wet and muddy trenches – and then the health problem that this caused, rather than just giving the feature.

Feature 2

Trenches were very crowded and there were few chances for people to wash themselves or their clothes. This meant that there were many lice, which spread from person to person and passed on trench fever where people became very ill with flu-like symptoms.

This takes the other feature described too briefly above – overcrowding – and improves it by giving details of how this led to another health problem.

Source skills 1

Questions 2(a) and 2(b) are based on **sources**. Question 2(a) will ask you about the **usefulness** of the sources and question 2(b) will ask you how you would **follow up information** in one source.

Usefulness

When answering question 2(a) you need to consider three things.

1 Content

- What information in the sources is relevant to the enquiry?
- How useful is this information?

Underline and annotate information in the source to help you with this.

Remember that this isn't necessarily about the amount of information given. A small piece of information can be very useful!

2 Provenance

- Nature: the type of source it is.
- Origins: who produced it and when.
- Purpose: the reason the source was created.
- How do these things impact on the usefulness of the source?

Remember that an unreliable source can still be useful.

3 Context

- Use your own knowledge of the enquiry topic to evaluate the source.
- Is the information in the source accurate compared with what you know?

Remember to think about what information is missing from the source as well as what's included.

Following up sources

For question 2(b) you have to complete a table like the one below.

Detail in Source X that I would follow up:

.....

Question I would ask:

.....

What type of source I could use:

.....

How this might help answer my question:

.....

This has to be related to the enquiry given in the question.

This must be related to the enquiry and the detail you've written above.

There are likely to be many different types of sources, but make sure you choose one that will really help investigate the question you've written above.

You should write one or two sentences explaining how the type of source chosen above could help you answer your question.

Examples of sources: national

- National army records.
- National newspaper articles and reports.
- Government reports on the Western Front.
- Medical articles by medical professionals who worked in the War.

Examples of sources: local

- Hospital records.
- Photographs.
- Personal accounts by soldiers and those who treated them.
- Local regiment statistics.

Source skills 2

In your exam you will be given a Sources Booklet containing two sources. Both questions 2(a) and 2(b) require you to **analyse** the sources, so it is important that you spend time reading and looking at them carefully before you start your answers. You could also annotate the sources to help you.

Source A: An x-ray taken in 1915 showing a bullet lodged in the armpit of a British soldier.

Take notice of any dates given. Do you know what was happening around this time in relation to the enquiry?

It's vital to read the information given about each source as this is where you'll find information on the **provenance** (nature, origin and purpose) of that source.

The purpose of photos can be difficult to assess as you'll rarely know why they were taken. However, with this image you can use your own knowledge of x-rays – why were they taken during the First World War?

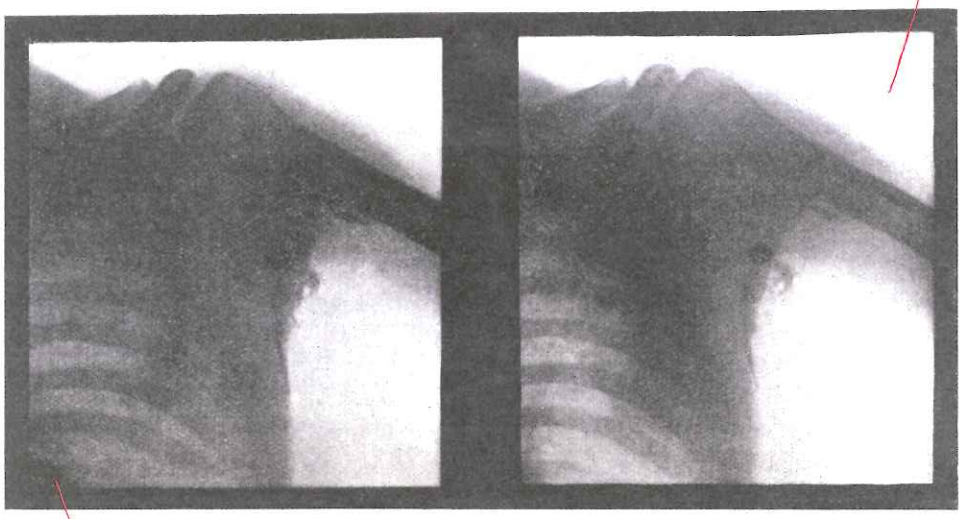


Image sources need analysing as well as text ones! What can you see in the image? What can't you see? How useful is this to the enquiry?

How well qualified is this person to give information relevant to your enquiry? That will affect how useful any information given is.

Source B: From the memories of John Hayward, who worked as a surgeon at a Casualty Clearing Station near Amiens, from July, 1918. Published in 1930 in *Everyman at War: Sixty Personal Narratives of the War.*

This gives two dates and shows that the person was writing around 12 years after the events. Does this have an impact on the reliability of the information?

"Resuss" was a dreadful place. Here were sent the shocked and collapsed and dying cases, not able to stand as yet an operation, but which might be possible after the warming-up under cradles in heated beds or transfusion of blood. The effect of transfusion was in some cases miraculous. I have seen men already like corpses, blanched and collapsed, pulseless and with just perceptible breathing, within two hours of transfusion sitting up in bed smoking, and exchanging jokes before they went to the operating table.

When you're reading the source, highlight any information given that is directly relevant to the enquiry.

Question 2(a): Usefulness of sources

Question 2(a) on your exam paper will ask you how useful two sources are for a particular enquiry. There are 8 marks available for this question.

Worked example

Study Sources A and B on page 32.

How useful are Sources A and B for an enquiry into the effectiveness of new medical techniques on the Western Front?

Explain your answer using Sources A and B and your knowledge of the historical context.

(8 marks)

What does 'how useful' mean?

How useful means how valuable are the sources for a specific enquiry. You need to come to a judgement on how useful each of the sources is for the enquiry given in the question.

Links You can revise new medical techniques on the Western Front on page 28.

Sample answer

Source A is an x-ray image showing a bullet in a British soldier's armpit. This source is quite useful for this enquiry because it shows us that the new medical technique of x-rays could successfully show doctors the exact location of a bullet in someone's body.

Always make a **judgement** on how useful a source is and then explain why you have reached this decision. This answer has done this by saying the source is useful because it shows where a bullet is in a body.

The caption tells us that this was taken in 1915 and I know that x-ray machines were used on the Western Front at this time. Static machines were used in Base Hospitals but it was quickly discovered that it was often too late to operate and prevent infection when a soldier had reached a hospital, so mobile x-ray machines were developed that could be taken to Casualty Clearing Stations closer to the front line. As this image isn't very clear, it may have been taken from a mobile x-ray machine, as these didn't produce such clear images as static machines could.

Use your **own knowledge** of the topic to analyse the source. This student tells us that they know x-ray machines were used on the Western Front, and then goes on to explain where they were used.

This image would have been created to locate the bullet, and it would then have been used by the surgeon to help remove the bullet during an operation. However, we cannot know from this source whether this operation was successful or not. We also do not know from this source how widespread the use of x-rays was and whether they were generally effective.

Remember to include reasons why the source was created. This can be quite tricky for photographs, as we often don't know, but, for x-rays, the student successfully does this using information from the caption combined with their own knowledge.

Source B is written by a surgeon at a Casualty Clearing Station on the Western Front ...

Don't waste time including information that isn't necessary. Keep your answer focused on information that is directly relevant to the source and the question, as the student has done here.

You **must** use both sources in your answer, so it's good to see that this student is continuing their answer by looking at Source B.

Question 2(b): Following up sources

Question 2(b) on your exam paper will ask you to pick a detail from one source and explain how you would follow up that detail in another source. There are 4 marks available for this question.

Worked example

Study Source B on page 32.

How could you follow up Source B to find out more about the effectiveness of new medical techniques in saving lives on the Western Front?
In your answer, you must give the question you would ask and the type of source you could use.
Complete the table below. **(4 marks)**

Detail in Source B that I would follow up: 'The effect of transfusion was in some cases miraculous.'
Question I would ask: How often were blood transfusions used on the Western Front?
What type of source I could use: Records from Casualty Clearing Stations with details of operations and whether or not blood transfusions were required.
How this might help answer my question: The army medical records would help me to see how widespread the use of blood transfusions was.

What does 'follow up' mean?

Follow up means investigate something further. In other words, how you could find out more information on something in one source using another source.

Links You can revise new medical techniques on the Western Front on page 28.

The table is provided to help you structure your answer so make sure you use the prompts as the student has done here.

Make sure the question is linked to the detail you have used in the first part of your answer.

Remember, you only need to give one type of source here. There is only 1 mark for each of the points so don't waste time going into more detail than is necessary.

This answer must relate to the type of source and the enquiry question you have chosen.

Question 3: Making comparisons

Question 3 on your exam paper will ask you to explain **one** way in which something was similar or different to something else. There are 4 marks available for this question.

Links You can revise medieval hospitals on page 4, and 19th century hospitals on page 13.

What does 'explain one way' mean?

Explain one way means providing details of one way in which something was similar or different. It does not need an explanation of why it was different.

Worked example

Explain **one** way in which hospital care was different in the 13th and 19th centuries.

(4 marks)

Sample answer

Hospitals in the 13th century were very religious. They were mostly used as somewhere to stay by travellers and pilgrims, but were also places where the elderly and some sick people were looked after. Patients got lots of rest and were kept clean but weren't really given treatment.

Hospitals in the 19th century were not usually run by the Church, so they weren't very religious. They were used as somewhere to treat sick people. Similar to 13th century hospitals, patients and their surroundings were kept clean. The focus of 19th century hospitals was on treating the sick.

Don't give a general description of hospitals in the 13th and 19th centuries as the student has done here. You have to give details of how hospital care was different.

The question asks for 'one' way, so only one is needed. There is no need to give more than one.

Make sure you answer the question asked. The question is about how hospital care was different – this answer mentions things that were similar, which is not what's required.

Improved answer

Hospitals in the 13th century were very religious. They were usually run by the Church and staffed by monks and nuns, and the focus was on worshipping God and preparing someone's soul for heaven.

Hospitals in the 19th century were usually run by charities. Their focus was not on religion but on caring for and treating the sick. They were run by nurses and doctors, and not by Church workers.

Make sure you just give **one** way, as the student has done here, and focus on difference, not similarities.

This question is only worth 4 marks so long answers are not required. Spending too long on this question will mean you run out of time for the higher-mark questions.

You need to give some detail of how hospitals in the 13th and 19th centuries were different, focusing on just one way.

Question 4: Explaining why

Question 4 on your exam paper is about causation: **explaining why** something happened. There are 12 marks available for this question, and two prompts to help you answer. You must also use information of your own.

Worked example

Explain why there was rapid change in the understanding of the cause of disease c1700–c1900.

You may use the following in your answer:

- Germ Theory.
- The work of Robert Koch.

You **must** also use information of your own.

(12 marks)

Answer extract

Louis Pasteur was a French scientist who worked on trying to prove the theory of spontaneous generation. Using microscopes, he discovered that very tiny organisms (bacteria or microbes) in the air caused wine to go off. He had proved that germs in the air cause decay and published his Germ Theory in 1861.

Robert Koch was a German scientist who discovered some specific germs that caused diseases. For example, he discovered the microbe that causes TB in 1882.

What does 'explain why' mean?

Explain why means saying how or why something happened, backed up with examples or justifications to support the reasons you give. Good ways to get into an explanation are to use sentence starters like 'One reason for this was ...', or 'This was because ...'.

Links You can revise ideas about the cause of disease c1700–c1900 on page 12.

This first paragraph follows one of the prompts given in the question. It demonstrates fairly good factual knowledge (AO1) of Pasteur and the Germ Theory, but does not use this knowledge to explain why (AO2) this improved understanding of the cause of disease.

The second paragraph follows the second prompt. Again, some good factual knowledge is shown but, again, there is no explanation.

You must link your factual knowledge with explanation and you must also **use some of your own knowledge** and not just rely on the bullets provided.

Improved extract

Louis Pasteur was a French scientist who worked on trying to prove the theory of spontaneous generation. This was the theory that rotting matter produced microbes that caused disease. Using microscopes he disproved this theory and discovered that very tiny organisms (bacteria or microbes) living in the air caused wine to go off. He published his Germ Theory, stating that germs in the air cause decay, in 1861. He also suspected germs were the cause of disease but had not proved this.

Pasteur continued his work and eventually, in 1878, published his Germ Theory of Infection, which proved that germs were the cause of disease. This work helped radically improve understanding of the cause of disease. Previously there had been many theories but no scientific proof.

This answer goes into more detail and begins to explain the link between Germ Theory and improved understanding of the cause of disease.

The student brings in their own knowledge in the second paragraph.

The best answers will link knowledge with an explanation. Crucially here, this answer links the work of Pasteur to an improved understanding of the cause of disease. Hopefully the rest of the answer will continue in this way.

Question 5/6: Making a judgement

Question 5/6 on your exam paper involves **analysing the statement** in the question and deciding how far you agree with it. There are 16 marks available (20 marks in total when SPaG is included) for this question, and two prompts to help you answer. You must also use information of your own.

Worked example

'There has been huge progress in the prevention of disease since c1900.'

How far do you agree? Explain your answer.

You may use the following in your answer:

- Government intervention.
- Genetic conditions.

You **must** also use information of your own.

(16 marks plus 4 marks for SPaG and use of specialist terminology)

Sample extract

I agree that there has been huge progress in the prevention of disease since 1900. In the first half of the 20th century, vaccines were developed against more and more diseases, such as diphtheria and polio. However, only the richest people could afford to get themselves vaccinated. This changed as the government paid for children to receive the diphtheria vaccine during the Second World War, and then for other vaccines. This meant that most people gained immunity from some diseases, which shows huge progress in preventing disease.

The government has also intervened in trying to prevent disease in other ways, too. It has passed laws to make the environment healthier, such as the Clean Air Act of 1956 and the ban on smoking in work places in 2007. This has helped prevent diseases, such as heart disease and lung cancer.

There is now a much better understanding of the cause of disease and how to prevent it so that people live healthier lives. This is helped by government lifestyle campaigns, which warn people about the dangers of certain things, such as smoking, or give tips on how to improve your health, such as the 5-a-day campaign where people are encouraged to eat 5 portions of fruit or vegetables every day.

Analysing the statement

The statement will always give a judgement on something. You decide whether you agree or not by weighing up points that support the statement with points that oppose it.

SPaG

In your answer to this question you will receive up to 4 marks for your spelling, punctuation and grammar and your use of specialist terms, so check your work carefully. Remember to use as much specialist terminology as you can.

Links You can revise disease prevention after 1900 on page 21.

Remember to give a clear indication of whether you agree or disagree with the quotation. It doesn't matter whether you agree or not, but you **must** state your opinion and then back it up.

Add in your own knowledge where you can. This answer demonstrates some good own knowledge of vaccination linked to the bullet point on government intervention.

This part of the answer concentrates on points that agree with the statement, but it's important to look at points that oppose the statement, too. In this case, the student could mention diseases that cannot yet be prevented, such as genetic conditions, or diseases that are increasing due to things such as obesity and binge-drinking.

Practice

Put your skills and knowledge into practice with the following question.

Option 11: Medicine in Britain, c1250–present and The British sector of the Western Front, 1914–18: injuries, treatment and the trenches

SECTION A: The British sector of the Western Front, 1914–18: injuries, treatment and the trenches

Answer Questions 1 and 2.

1 Describe **two** features of the system of transport for the wounded on the Western Front. **(4 marks)**

Feature 1

Guided The non-walking wounded were carried from where they had been injured by .....

.....

.....

.....

.....

Feature 2

.....

.....

.....

.....

.....

.....

You have to answer all questions in Section A. You should spend about 25 minutes on this section. Remember to leave 5 minutes or so to check your work when you've finished writing.

Links You can revise the system of transport on page 26.

You need to identify **two** valid features and support each feature.

Your exam paper will have a separate space for each feature you need to describe.

Describe means you have to give an account of the main characteristic. You do not need to explain why the feature was important or what it was trying to achieve.

Practice

Put your skills and knowledge into practice with the following question.

2 (a) Study Sources A and B on page 55.

How useful are Sources A and B for an enquiry into the health problems experienced in the trenches on the Western Front?

Explain your answer, using Sources A and B and your knowledge of the historical context. **(8 marks)**

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Practice

Use this page to continue your answer to question 2(a).

It's a good idea to conclude your answer by again stating how useful you think both sources are.

Remember, you don't need to compare the sources!

Practice

Put your skills and knowledge into practice with the following question.

2 (b) Study Source B on page 55.

How could you follow up Source B to find out more about the health problems experienced in the trenches on the Western Front?

In your answer, you must give the question you would ask and the type of source you could use.

Complete the table below. **(4 marks)**

Detail in Source B that I would follow up:

.....

.....

.....

Question I would ask:

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What type of source I could use:

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.....

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How this might help answer my question:

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.....

Links You can revise the health problems in the trenches on page 25.

You will be given a table with writing lines into which you should write your answer. There are only 4 marks for this question so you don't need to spend time going into detail.

It's important that you focus on the enquiry given in the question here. There are several details in the source, which you may like to follow up, but the detail you choose has to be relevant to health problems experienced in the trenches.

This question must relate to the detail you've given above.

There are many sources that you could suggest but pick one that you can give a good explanation of. Just one or two sentences might help answer your question.

See page 31 for the types of sources you could suggest.

Practice

Put your skills and knowledge into practice with the following question.

SECTION B: Medicine in Britain, c1250–present

Answer Questions 3 and 4. Then answer EITHER Question 5 OR 6.

3 Explain **one** way in which attempts to prevent disease were different in the 17th and 19th centuries. **(4 marks)**

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Links You can revise disease prevention in the 17th century on page 15 and in the 19th century on page 21.

Remember to just give **one** reason as the question asks. For example, you could focus on public health by saying that, although people tried to keep streets clean in the 17th century to prevent disease, by 1900, city authorities had to do this by law.

You don't need to explain why they were different, just how! The question is only worth 4 marks and there's limited writing space, so don't waste too much time on answering this question.

Practice

Put your skills and knowledge into practice with the following question.

4 Explain why there was rapid change in surgery during the 19th century.

You may use the following in your answer:

- Joseph Lister.
- Anaesthetics.

You **must** also use information of your own. **(12 marks)**

Remember that question 4 is all about **causation**: this means you are looking for relevant reasons.

Guided The second half of the 19th century saw rapid change in surgery due to two out of the three problems (blood loss, pain and infection) being solved: these previously made surgery so dangerous.

The discovery of a more effective anaesthetic had solved the problem of pain. Before the 19th century, alcohol and opium had been used to try and numb the pain during operations but they weren't very successful and patients still felt pain during surgery. This meant it was necessary for the surgeon to be extremely fast and also that the patient moved during the operation, which meant that surgeons were likely to make mistakes.

Links You can revise improvements in surgery in the 19th century on page 14.

For example, you might use the first prompt and write about Joseph Lister's work in developing antiseptics, which solved the problem of infection.

There are 12 marks in total for this question. You don't have to use the prompts in the question in your answer but you **must** include your own information to answer the question fully.

You need to give more than one reason and the best answers will show how different factors combined to prevent or bring about change.

Your explanations need to stay focussed on answering the question. Although you might remember lots of detail, you need to focus on providing **reasons why**, not descriptions of.

Practice

Use this page to continue your answer to question 4.

'Rapid change' may not necessarily mean that things always improved. For example, you could write about surgery between 1846 and 1870, when the death rate rose due to anaesthetics allowing deeper, more complex surgery to be performed, despite the fact that problems of infection and blood loss still hadn't been resolved.

Remember, the best answers to question 4 will show a good knowledge of the key features and characteristics of the period, analyse the reasons for change or continuity **and** show how factors combined to bring about change or keep things the same.

Make sure you support your explanation with a good range of accurate and relevant detail throughout your answer.

Practice

Use this page to continue your answer to question 4.

Practice

Put your skills and knowledge into practice with the following question.

Answer EITHER Question 5 OR Question 6.

Spelling, punctuation, grammar and use of specialist terminology will be assessed in this question.

EITHER

5 'John Snow's work linking water with the spread of cholera led to major breakthroughs in preventing the spread of disease.'
How far do you agree?
Explain your answer. **(16 marks, plus 4 marks for SPaG)**

You may use the following in your answer:
- The Broad Street Pump, Soho.
- The Public Health Act 1875.

You **must** also use information of your own.

OR

6 'Medical treatments and preventions during the Medieval period were based on religion and superstition.'
How far do you agree?
Explain your answer. **(16 marks, plus 4 marks for SPaG)**

You may use the following in your answer:
- Bloodletting and purging.
- Praying and fasting.

You **must** also use information of your own.

You have a choice of two questions for your final question of the exam. Each question is worth the same number of marks. Even though one might immediately seem a question you can answer, do read both carefully to check your choice is the right one.

On the exam paper, Questions 5 and 6 will be on one page, and you will then turn to the next page to write your answer, like the layout here.

If you decide to answer 5 turn to page 47. If you decide to answer 6, turn to page 51.

Total for Question 5 = 20 marks. There are 16 marks plus 4 marks for spelling, punctuation, grammar and use of specialist terminology.

Links You can revise the work of John Snow on page 17, and Medieval treatments and preventions on page 3.

Choosing a question

At the top of the first answer page there will be an instruction for you to indicate which of the two questions you have chosen to answer. You do this by making a cross in the box for Question 5 or Question 6.

Don't worry if you put a cross in the wrong box by mistake. Just put a line through the cross and then put a new cross in the right box.

Practice

Use this page to begin your answer to question 5.

Indicate which question you are answering by marking a cross in the box. If you change your mind, put a line through the box and then indicate your new question with a cross.

Chosen question number: **Question 5** ☒ **Question 6** ☐

Remember to **only** answer **either** Question 5 **or** Question 6 in the exam.

Guided I disagree that John Snow's work linking water with the spread of cholera led to major breakthroughs in preventing the spread of disease. His work did show that there was a link between the Broad Street pump and cholera, but he couldn't prove why this was the case so the authorities didn't believe him when he presented his findings to them

As with question 4, you do not have to use both or either of the two prompts provided by the question. If you do use them, remember that you **must** also include information of your own.

Plan your answer before you start writing. List factors that support the statement in the question and list other factors that go against the statement:

Support	Against
Helped build up evidence that cholera was spread in water.	Authorities didn't believe him.
Prevented any more people dying in one place – by stopping use of the Broad Street Pump.	Wasn't until much later (Public Health Act 1875) that authorities had to provide clean water, which did lead to major breakthrough.
	Snow hadn't proved disease could be caused by water – work of Pasteur, Koch etc. came later.

Practice

Use this page to continue your answer to question 5.

Bring specific facts and details into your answer to show how well you understand the key features and characteristics that are involved in the question.

End your answer by saying **how far** you agree with the question statement and give support for your decision.

Remember, this question is where you will also receive marks for your spelling, punctuation and grammar and use of specialist terms, so write and check your work carefully!

Practice

Use this page to continue your answer to question 5.

Had a go ☐ Nearly there ☐ Nailed it! ☐

Practice

Use this page to continue your answer to question 5.

Practice

Use this page to start your answer to question 6.

Indicate which question you are answering by marking a cross in the box. If you change your mind, put a line through the box and then indicate your new question with a cross.

Chosen question number: **Question 5** ☐ **Question 6** ☒

Remember to **only** answer **either** Question 5 **or** Question 6 in the exam.

Guided

I agree that Medieval medical treatments and preventions were based on religion and superstition. The vast majority of people were very religious and strongly believed that God caused disease. This was taught by the Church during church services, which was the only form of education that most people received. The Church was extremely powerful and controlled medical training, which meant that physicians, too, were taught what the Church wanted them to learn.

As with question 4, you do not have to use both or either of the two prompts provided by the question. If you do use them, remember that you **must** also include information of your own.

Plan your answer before you start writing. List factors that support the statement in the question and list other factors that go against the statement.

Support	Against
Religious treatments and preventions, such as praying, fasting, flagellation etc.	Use of herbal remedies in treatments.
Use of astrology in timing of treatment.	Purifying the air due to belief in miasma as a cause of disease.
Use of relics and lucky charms.	Treatments and preventions based on Four Humours e.g. bloodletting, purging, theory of opposites.

Practice

Use this page to continue your answer to question 6.

Bring specific facts and details into your answer to show how well you understand the key features and characteristics that are involved in the question.

End your answer by saying **how far** you agree with the question statement and give support for your decision.

Remember, this question is where you will also receive marks for your spelling, punctuation and grammar and use of specialist terms so write and check your work carefully!

Practice

Use this page to continue your answer to question 6.

Had a go ☐ Nearly there ☐ Nailed it! ☐

Practice

Use this page to continue your answer to question 6.

Sources Booklet

Use these sources to answer the questions in Section A (see pages 38–41).

Sources for use with Section A.

Source A: From the pocket diary of Rifleman William Eve, for January 1915. Eve later recovered from trench foot and returned to the front line, although he later developed epilepsy and was invalided from the army in July 1916.

4 Jan:
Raining hard. Everything in a very bad state.

7 Jan:
Poured with rain all day and night. Water rose steadily till knee deep when we had the order to retire to our trenches.

16 Jan:
Marched to billets at Houplines. The people were awfully good, doing anything for us. Boiled water for us to wash our feet and bandaged them. After washing, my feet were very bad. Went for parcels, which made them worse.

17 Jan:
Paraded sick [inspected] for feet … Went to dressing station to go to hospital at 4pm. Waited in a sort of barn for horse ambulance. It arrived at about 8pm took us to Armentieres. Stayed the night in a hospital.

19 Jan:
Left for Southampton at 12pm on the St Andrew.

Source B: From an article, 'Some Notes on Trench Fever', by Captain T Stretill Wright, published in the British Medical Journal, 29 July 1916. He was an army doctor who made these notes during the winter of 1915–16 from clinical observations on patients in the medical wards of a base hospital.

Among the very large numbers of cases that came down to us from the front labelled 'influenza' and 'PUO', there were some thirty cases of a new type. These cases were carefully observed, and a remarkable similarity was noticed in the symptoms they presented and in the course they ran. The symptoms conformed to the type that we had come to associate with trench fever, and before the end of November we had begun to employ this term in diagnosing them.

The ultimate cause of the disease is as yet a matter of speculation, but lice [seems most likely as] there has been a plague of rats and mice not only in the trenches, but also in the artillery dugouts and in the barn and stables that serve as billets for the troops.

Answers

Where an example answer is given, this is not necessarily the only correct response. In most cases there is a range of responses that can gain full marks.

SUBJECT CONTENT

Medicine in Britain, c1250–present

c1250–c1500: The Middle Ages

1. Ideas: supernatural and religious

(a) The maintenance and development of natural/herbal medicines.

It emphasised caring for the sick and set up hospitals.

It maintained libraries of books containing medical teachings.

It developed centres of learning.

(b) It didn't approve of people questioning their traditional beliefs and ideas about the cause of disease.

The emphasis was on caring for the sick, not on curing disease.

It made sure the focus was on religion, both as a cause and possible cure for disease.

It disapproved of dissection.

2. Rational explanations for disease

Reasons include the following:

- People believed the ideas of Hippocrates and Galen were completely correct so did not challenge them.
- The sheer number of books written by Hippocrates and Galen that had survived meant their ideas dominated.
- Questioning and experimenting was discouraged by authorities and the Church.
- Christianity was hugely important and liked and promoted Galen's ideas. Most books were produced in monasteries and the Church maintained libraries so the Church's chosen texts were the ones that were read.
- There were few other rational explanations for disease.
- The Church disapproved of dissection, so people didn't check Galen's theories of anatomy for themselves.

3. Approaches to prevention and treatment

Bathing and washing the body and exercise – methods recommended by Hippocrates and Galen in the Ancient world and therefore physicians in the Middle Ages continued to follow their ideas; 'cleanliness next to Godliness', so it was important to keep your body as well as your soul 'clean' for God, which would help you stay healthy; bathing also related to miasma, as bad smells indicated bad air and therefore disease.

Not overeating, bleeding and purging – prescribed by Hippocrates, Galen and medieval physicians, thought to be important to keep the humours balanced.

Purifying the air and keeping streets clean – thought that 'bad air', rotting corpses etc caused disease. Also, bad smells indicated sin so cleaning and purifying the air was done for religious reasons.

4. Approaches to caring for the sick

Physicians – their patients were wealthy people with all kinds of ailments, illnesses and injuries; physicians rarely 'treated' people themselves but prescribed treatments and sent patients to barber-surgeons (for bloodletting) and apothecaries (for remedies, emetics, laxatives, etc).

Barber-surgeons – cost money so wouldn't treat the poor; didn't really treat illness except treated those referred by physicians for bloodletting; treated toothache by removing teeth; performed minor surgery on injuries and ailments.

Apothecaries – treated people with all types of illness with remedies, or had ailments/minor injuries with remedies or ointments; cost money so wouldn't treat the poor. People would go directly to an apothecary or be sent by a physician.

Home – most ill people, the elderly, women in childbirth, people with injuries. Most were treated by a female relative, though they could also be treated by the local wise woman. The very wealthy would have been treated in their homes by a physician.

Hospitals – most admitted those with minor illnesses who needed rest and recuperation. Those with infectious diseases or incurable conditions weren't admitted (except for specific hospitals for lepers etc).

5. The Black Death, 1348–9

Praying or fasting; flagellants walking in a procession to a church whipping themselves and praying were all used to try and prevent the Black Death. This demonstrates the idea that God brought disease as a punishment for people's sins.

People cleaned up the streets and their homes, carried herbs and spices to stop them breathing 'bad air' and tried to keep the air moving by birds, or lighting a fire to try and prevent the Black Death. This demonstrates the ideas that disease was caused by miasma.

Bleeding and purging were used to prevent and treat the Black Death. Also, eating cool things and taking cold baths were used for treating it. All these demonstrate the idea that disease was caused by an imbalance in the humours.

People carried lucky charms to prevent the Black Death, which demonstrates the idea that disease was caused by witches or strangers.

c1500–1700: The Renaissance

6. Ideas: a scientific approach

Belief in miasma remained the same – many people believed it as they had during Medieval times.

Belief in the Theory of the Four Humours declined during the Renaissance. Few doctors still believed it by 1700, but many of the general population still did.

Belief that God caused disease declined during the Renaissance due to the declining influence of the Church, but some still continued to believe this.

7. Transmission of ideas

The printing press:

- made publishing books, pamphlets, journals etc much easier and quicker, which helped spread ideas about medicine
- meant that doctors and scientists could read about each other's work more quickly, which meant they could share discoveries, knowledge and treatments with a wider range of people than previously
- meant that books could more easily contain complex illustrations, which helped explanation and helped doctors copy the ideas of others in their treatments
- helped to reduce the Church's control over medical training, as the Church had previously been the place where most books had been copied and kept, which meant that only those books that were acceptable to the Church were published.

8. Continuity in prevention, treatment and care

There were few totally new treatments as there were few totally new ideas about what caused disease. Although there had been many breakthroughs in medical discoveries, it took time for these to be accepted and most of these were in the field of anatomy, so did not have a direct impact on medical treatments.

9. Change in care and treatment

Could include:

- He carried out a lot dissections on human bodies – the Church disapproved of this so it was not commonly done in Medieval times.
- He questioned the teachings of Galen and proved some of his work to be incorrect – questioning the status quo and the theories of Galen was extremely rare in Medieval times.
- He encouraged and inspired others to continue to question, challenge and prove his own theories – questioning and experimentation was very rare in Medieval times.
- Due to the invention and widespread use of the printing press, Vesalius was able to widely publish and distribute his book throughout Europe enabling his ideas to spread far more quickly that ideas did during Medieval times.

10. The Great Plague, 1665

Any six prevention methods from the following:

Prevention method	Why it was done?
Quarantine (boarding houses up for 28 days if they had a plague victim).	All these methods were used as it was believed plague was transmitted from person to person.
Putting victims in pest houses.	
Collecting the dead every day and burying them quickly in deep graves.	
Banning large gatherings, closing theatres.	
Leaving or escaping from places with the plague.	
Regularly cleaning streets.	All these methods were used as it was believed plague was transmitted through miasma (through the air).
Killing stray animals.	
Lighting fires by burning tar or herbs.	
Carrying pomanders or oranges with cloves.	
Smoking or chewing tobacco.	
Perfuming clothes.	
Praying.	These were done as God was believed to cause plague.
Fasting.	
Eating special diets.	Nobody knows why they were done but people believed they might work.
Using remedies or plague water supplied by apothecaries.	

11. William Harvey

Factors such as:

- the work of previous individuals, such as Vesalius, in making the study of anatomy popular and beginning the questioning of Galen's theories
- changing attitudes in society – the Renaissance questioning, declining power of the Church, dissections becoming more acceptable
- Charles I – allowing and encouraging his work
- Royal Society – publishing his work
- technology – printing press in publishing his work (and the work of others that inspired him), fire fighting pumps giving Harvey the idea of the heart working as a pump.

c1700–c1900: 18th and 19th Century

12. Germ Theory and microbes

Any three from:

- Technology, e.g. improvements in microscopes allowed microorganisms to be clearly seen.
- Scientific methods of experimenting, observing and recording.
- Individuals – Pasteur's scientific knowledge and skills of investigation.
- Institutions – the French Academy of Science challenged scientists to prove spontaneous generation.
- Industry – Pasteur was working for the brewing industry, which financed his research.

13. Improvements in hospital care

Examples include:

- Hospitals were cleaner and more hygienic, so infection was less likely.
- Nurses were trained and had a more central role, so they gave better care.
- Hospitals were better designed in terms of light, ventilation and sanitation.
- Visitors were no longer involved in caring for patients.
- Public pressure led to infirmaries (separate from workhouses) for the poorest people in society.
- Specialist hospitals for different conditions meant that infectious people were kept separate from others and patients were more likely to receive specialist care.

14. Anaesthetics and antiseptics

- The development of more successful anaesthetics meant that surgery became pain free, so patients didn't struggle during operations and surgery could take longer, which meant that surgeons found successful operations easier to perform.
- The discovery of antiseptics reduced the death rate of infection during surgery, which made surgery more successful.
- Antiseptics eventually led to aseptic conditions being used for operations, which dramatically reduced the amount of infections.
- Anaesthetics and antiseptics meant that more complex operations could be attempted/were more successful.
- Earlier discoveries about human anatomy (Vesalius, Harvey etc) improved surgeons' knowledge about the body and how it worked.

15. Approaches to prevention of disease

Any two from:

- It was the first Public Health Act that was compulsory – signalled the government accepted responsibility for living conditions in cities.
- It applied to all parts of Britain – every part of the country had to have a public health authority.
- Led to improvements in living conditions and therefore the health of the population of cities began to improve.
- There were no more cholera epidemics after the act.

16. Jenner and vaccination

Factors include:

- Jenner as an individual – the way he worked and the fact that he used scientific methods and thinking.
- Communication, which meant other people heard about his ideas (he published his own results).
- The work of the Jennerian Society to promote vaccination.
- People accepting the theory and being prepared to be vaccinated.
- Government action in making vaccination compulsory.

17. Fighting cholera in London, 1854

He was significant as he prevented many deaths from cholera after he made the link with the Broad Street pump, and added to the body of evidence that contributed to the government ordering and paying for the new London sewers. He was also significant because he added to the body of evidence that proved that cholera (and other diseases) were caused by dirty water, leading to the Public Health Act of 1875 which forced city authorities to provide clean water.

His significance was limited as he wasn't believed by many people, so action wasn't taken elsewhere to clear up water supplies until much later. Also, the government didn't act on his recommendation to build new sewers until other evidence had come along, and the Board of Health didn't believe his theory that cholera was caused by dirty water and therefore didn't do anything to improve the water supplies until much later.

c1900–present: Modern Britain

18. Ideas: genetics and lifestyles

The discovery of the structure of DNA led to:

- a greater understanding of genetic conditions
- a realisation that some illnesses (such as some types of cancer) could have a genetic cause
- the future possibility that cures/treatments could be found for some genetic conditions
- the future possibility that ways of preventing genetic diseases could be found
- the discovery of stem cells has led to the possibility of replacing faulty cells
- better vaccines for some conditions
- new techniques for skin grafts
- the creation of cells for the manufacture of insulin to help sufferers of diabetes.

19. Improvements in diagnosis

Any three from:

- Doctors examining patient, then using their own knowledge to diagnose the illness.
- Doctors examining patient, then using medical textbooks, articles etc to diagnose the illness.
- Testing blood, urine, skin, biopsies etc to diagnose the illness.
- Specialists looking into the patient's body using x-rays, scanners, endoscopes etc to diagnose the illness, surgery to look into patient's body.
- Monitors for heart rate, blood pressure, blood sugar etc to diagnose problems.
- Patients themselves or friends/relatives using books, internet articles, monitoring kits etc to diagnose illness.

20. Change in care and treatment

Factors include:

- Previous scientific discoveries such as Germ Theory.
- Work of individuals, such as Paul Ehrlich, Dr Hata, Fleming, Florey and Chain and Karl Landsteiner.
- Technology to help: develop and administer drugs; with medical treatment (e.g. dialysis machines, pacemakers, artificial limbs); and in surgery (e.g. micro instruments, robots, cameras).
- Funding of research and treatment by the government, drug companies, universities etc.
- War – First and Second World Wars both saw high casualties and the need for improved treatments.
- Accident/luck (e.g. Fleming's discovery; Dr Hata going back through previous work).

21. Preventing disease

Reasons include:

- Improved living conditions.
- Increase in wealth – people eating better, etc.
- Government funding of health care.
- Better education, helping people to lead healthier lives.
- Better understanding of what causes disease.
- Increased prevention of diseases through vaccination.
- Scientific breakthroughs in chemical cures, antibiotics, blood transfusions and other treatments.
- Improved technology to diagnose, monitor and treat illness.
- Improved and more professional training of doctors, nurses and paramedics.

22. The development of penicillin

Factors that led to penicillin as a cure include:

- Scientific research – by Fleming, Florey and Chain (and their teams).
- Luck or chance – Fleming discovering it worked.
- War – increased the need for a cure for bacterial infections.
- Communication – Florey and Chain.
- Government funding – to fund first the research and then the manufacture of penicillin.
- Perseverance of individuals.
- Team work.

23. The fight against lung cancer

Any three from:

- Plain packets.
- Banning the advertising of tobacco products.
- Highly taxing tobacco products to raise the price.
- Banning smoking from workplaces in 2007.
- Raising the age at which people can buy tobacco products to 18 from 16.
- Banning shops from displaying tobacco products.
- Funding various campaigns about the risks of smoking.

The British sector of the Western Front, 1914–18: injuries, treatment and the trenches

The historic environment

24. The trenches

Maps, photographs, personal letters and government reports.

25. Injuries and illnesses

(a) Preventing trench foot: supplying whale oil and spare socks and instructing troops on what to do; using mechanical pumps to remove water from the trenches.

Preventing trench fever: delousing stations.

(b) Head injuries from bullets or shrapnel: supplying Brodie helmets.

Gas attack: supplying gas masks.

26. RAMC and FANY

- Regimental Aid Posts – closest medical help to the front line; one medical officer plus stretcher bearers; gave basic first aid and pain relief.
- Field Ambulance – about a mile back from the front line; included dressing stations to treat troops; staffed by medical officers, orderlies and stretcher bearers, and later nurses (no doctors).
- Casualty Clearing Stations – first place where casualties could see a doctor, first place where there was significant medical equipment; several miles from the front line; carried out treatment, including operations.
- Base Hospitals – far from the front line near to coastal ports; many medical staff; aseptic conditions; patients could stay for some time; became places where doctors gained special knowledge of certain wounds or treatments.

27. Medicine in the early 20th century

1 X-rays – could be used to see damage to bones; also used to locate any metal objects in the body – bullets, shrapnel etc.

Blood transfusions – if people's blood types were known, blood transfusions could be done to treat blood loss and shock from wounds, and could also be used to treat blood loss from surgery.

Aseptic surgery – would be very useful in preventing infection as likely to be a large number of operations needed.

2 X-rays – problems would include keeping badly hurt men still enough to take a clear image; machines were large and heavy so were expensive to build and could not really be used on the battlefield.

Blood transfusions – problems would be the inability to store blood and therefore get it to where it was needed.

Aseptic surgery – keeping and maintaining aseptic conditions would be very difficult close to the battlefield (would need to be in hospitals probably far from the front line).

28. Medical advances

Wound infection – use of chemicals on wounds to kill bacteria, and then sterilised salt solution to continually clean the wound; improvements in surgery so all damaged and infected tissue was removed as well as all traces of the bullet/shrapnel.

Blood loss – blood could not be stored as it clots, so before 1917 transfusions had to be done directly from person to person, which limited how many could be treated and how quickly. Various chemicals and refrigeration were then found to prevent blood clotting, allowing blood to be stored and transported to where it was needed after 1917.

Broken legs – the Thomas Splint was used from December 1915 to ensure legs were kept rigid, which reduced blood loss; mobile and static x-ray machines were used to locate bullets and shrapnel, so surgeons could remove them; wounds were treated for infection (see above).

Bullets and shrapnel – mobile and static x-ray machines were used to precisely locate even the smallest remnants in the body, so surgeons could successful remove them; improvements in brain surgery and plastic surgery meant items were successfully removed from the head and reconstructed; wounds were treated for infection (see above).

PRACTICE

38. Practice

1 Any two features from:

- First and second stage – the non-seriously injured would walk to the Regimental Aid Post and, if necessary, on to the Field Ambulance.
- First and second stage – more seriously injured would be carried by stretcher-bearers to the RAP and, if necessary, to the Field Ambulance. Usually, 4 men would carry one stretcher.
- Third stage would involve transport by horse ambulance or motor ambulance to a Casualty Clearing station. There were more horses than motorised ambulances and in many battles the motorised vehicles could not get through the mud. This varied between 2 and 6 horses pulling an ambulance wagon, depending on the terrain.
- Fourth stage would involve transport by motor ambulance, train or canal barge to a base hospital.

39. Practice

2 **(a)** Source A is useful because it's an example of a case of trench foot that must have been a serious case, as the soldier was sent home for treatment and to recover from it. It describes the weather conditions and waterlogging that caused the disease. The author also describes treating his feet by washing and bandaging them, though this obviously didn't help.

However, it doesn't describe the symptoms of the disease and is an example of just one case.

As a private diary, this is likely to be a truthful source as it was probably just written for the soldier's own record of events.

This could be corroborated by the student's own knowledge of trench foot being a problem in the trenches and particularly bad at this time (Jan 1915) due to the terrible weather, poor drainage in the trenches and lack of protection for soldier's feet at this time. As the war continued, troops were given spare socks and whale oil to try and keep their feet dry, and drainage in the trenches was improved and platforms made so troops could keep their feet out of the mud.

Source B: Useful because it describes cases of trench fever in a base hospital.

As it's written by a doctor in a base hospital, and for a medical journal, it's likely to be a true account of his experiences. As a medical 'expert', it's likely to be reliable and was written only a few months after the events described from notes he'd written at the time.

This could be corroborated by the student's own knowledge of trench fever being a problem at this time. It was written in 1916, before the cause of the disease (lice as the doctor correctly predicts) was discovered in 1918, after which efforts to reduce lice markedly reduced cases of the disease.

41. Practice

2 **(b)** Detail in source that I would follow up: 'some thirty cases of a new type [trench fever]'

Question I would ask: How prevalent was trench fever?

What type of source I could use: Base hospital records

How this might help answer my question: To find out the number of cases of trench fever in another base hospital over the same period to compare them.

42. Practice

3 Any one from:

- Vaccinations – by 1900, people were using vaccination to prevent smallpox and other vaccines were being developed due to the work of Pasteur and Koch. In the 17th century there were no vaccinations.
- After 1875, the Public Health Act meant that city authorities had to provide clean water, public toilets and effective sewers, which they didn't need to do before this date. This prevented many infectious diseases, such as cholera. In the 17th century, people believed miasma caused disease, so there were attempts to remove sewage and rubbish, but this wasn't done on a large scale or by the authorities.
- In the 17th century many people still relied solely on superstitions and religious means, such as prayer, to prevent disease. These methods were far less common in the 19th century.

43. Practice

4 Answer could include:

- The development of anaesthetics throughout the 19th century – use of laughing gas, then ether, then chloroform in 1847, with details on James Simpson's work. Must include an explanation of **how** this changed surgery – ie. It meant that patients didn't feel pain, which kept them still during the operation and meant the surgery didn't have to be so quick, meaning the surgeon could be more careful.
- The use of chloroform actually increased the death rate from surgery – Black Period 1847–1870 – as surgeons were performing more complex operations deeper inside the body, so risk increased and the other two major problems of surgery (blood loss and infection) still hadn't been resolved.
- Joseph Lister's development of antiseptics – the use of carbolic acid to prevent surgical wounds from being infected and also to keep equipment and wards free from infection. Must include an explanation of **how** this changed surgery by reducing the infection rate after surgery and reduced infections in the first place.
- Improved training and knowledge of doctors and surgeons from the 18th century so they had an improved knowledge of anatomy. Also, people like Simpson and Lister wrote articles in medical journals publicising their work so that others could copy. Must include an explanation of **how** this changed surgery by improving the skills and knowledge of surgeons allowing them to operate more successfully and to carry out more complex operations.

46. Practice

5 Answers must state how far the student agrees with the quotation. Evidence to support the statement includes:

- John Snow's work linking the water supplied from the Broad Street pump in Soho, with people getting cholera, which included him removing the handle so the pump could not be used, was a breakthrough in preventing the disease as many people in that area who would have contracted cholera did not.
- John Snow's work was part of increasing evidence, which he presented to the authorities, that illness could be caused and passed on through water, which did lead to the major breakthrough of the Public Health Act of 1875 where city authorities had to ensure water supplies were clean.

Evidence against the statement:

- John Snow presented his findings in 1854 but nothing was done at the time, as the authorities didn't believe him. His only breakthrough was in preventing cholera in that one area of London, not on a wider scale. There was another outbreak of the disease in 1866.
- Other factors, such as the Great Stink in 1858, and further epidemics of cholera and other diseases, were more responsible for the government's Public Health Act of 1875, which was a major breakthrough in preventing the spread of cholera, as finally city authorities had to provide clean water and sewers.
- Although Snow's work pointed to a link between dirty water and cholera, he couldn't prove the link or explain what was happening. It was only after Pasteur's Germ Theory in 1861, which published the beginnings of scientific proof that bacteria in water could cause disease, that more people believed Snow's work.

6 Answers must state how far the student agrees with the quotation. Evidence to support the statement includes:

- Most people used religious methods to prevent and treat disease in the Middle Ages. These included praying, fasting and going on pilgrimage, as well as living a good Christian life, such as going to church regularly and obeying the Ten Commandments. During the Black Death of 1348 some people carried out flagellation in the streets: whipping themselves to show God how sorry they were for people's sins, in the hope that this would prevent them catching the disease.
- Many people used superstitious methods for treating and preventing disease in the Middle Ages, such as carrying lucky charms or amulets and chanting incantations. There were specific superstitious 'cures' for specific illnesses, such as hanging a magpie's beak around your neck to cure toothache.

- Doctors used astrology during diagnosis and treatment of patients. Many people thought that some diseases, especially epidemics, such as the Black Death, were caused by the alignment of planets and stars, so they believed astrology would help treat disease.

Evidence to oppose the statement includes:

- Medieval physicians used bleeding and purging as their main method of preventing and treating disease. This was because they believed in the Ancient Greek idea of the Four Humours. According to this, disease was caused by an imbalance of the humours, so bleeding and purging would get rid of excess humours, therefore re-balancing the Four Humours and preventing and treating the illness.
- The beliefs and writing of the Greek doctor, Galen, who worked in Ancient Rome, were prevalent in the Middle Ages. His treatments were based on the Four Humours and his own 'Theory of Opposites', in which the humours were balanced by giving a patient the 'opposite' to their symptoms.
- Some people in the Middle Ages believed that disease was caused by 'bad air', or miasma, so they tried to prevent disease by keeping themselves and their houses and streets clean.

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