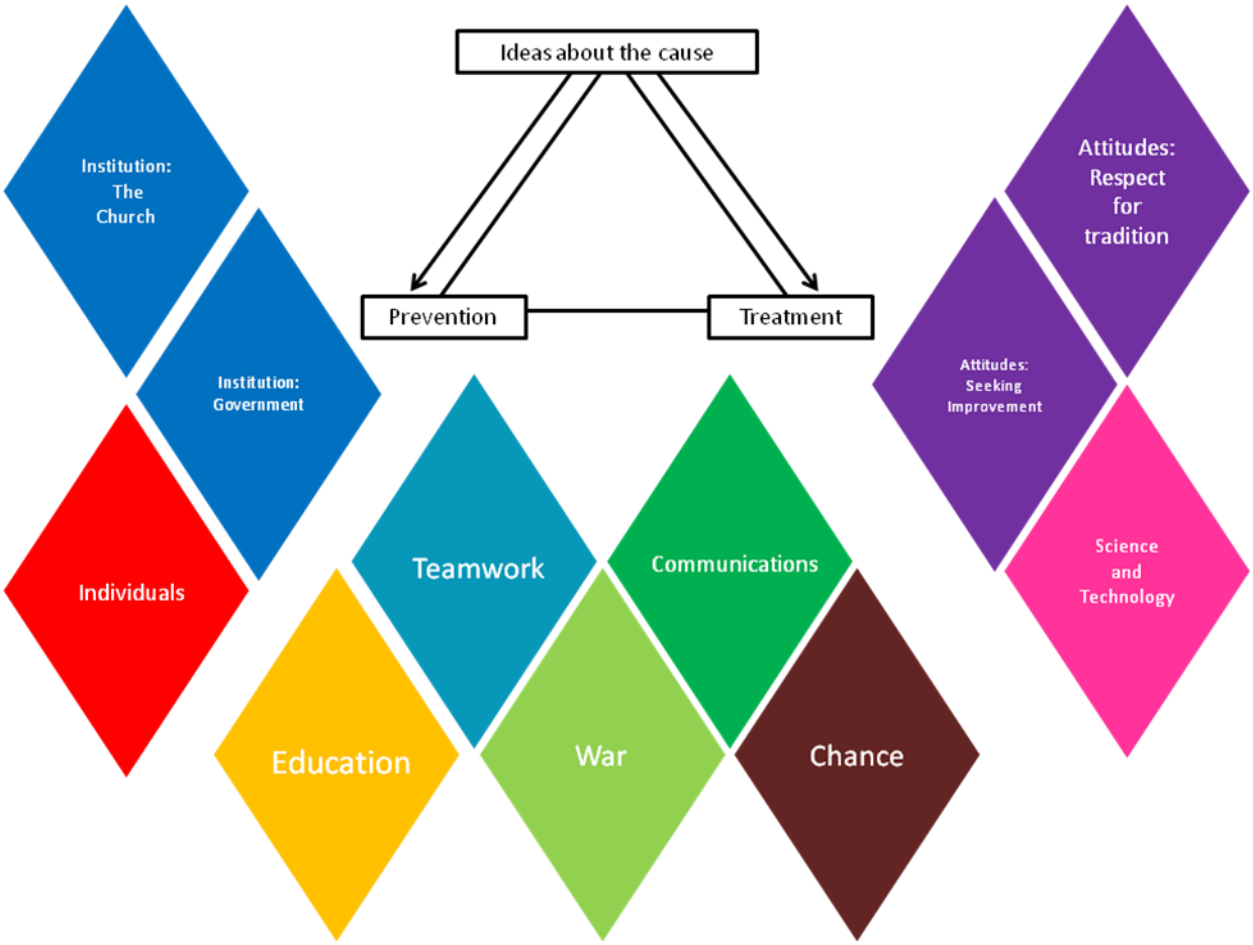
GCSE History
Knowledge Booklet

Present-day Britain
c1900-2020

The History of Medicine is about some of the most important questions in the whole of history. Today we live far longer than our ancestors did. We are healthier and have more chance of surviving major illness. **So why has medicine- and our health - changed so much over the centuries? This paper is about why there were changes and continuities throughout the ages.**

This booklet will help you to focus on medicine in modern Britain and the changes and progress in medical thinking and practice but also recognising links to previous periods and issues that are still to be overcome.

Examples of Factors that causes change and continuity.



History of medicine Contents

Key Topic 4: c1900 - present. Medicine in Modern Britain

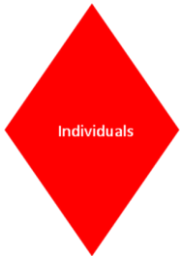
Key Topic 4.1 Ideas about the causes of disease and illness

The advances after 1900 proved that there is not just one cause of disease. In addition to bacteria we now know there are viral infections, genetic mutations and lifestyle causes that led to disease.

Understanding of disease

- People at this time Understood germ theory and continued to identify specific bacteria and developed methods of targeting them in different ways to cure disease.
- However viruses were too small to be seen under a microscope and were not discovered until later when more powerful microscopes were developed.

- **Watson and Crick discovered DNA in 1953**. This helped people to understand that some diseases were genetic. (Down's syndrome, Alzheimer's disease, Parkinson's disease, Cystic Fibrosis, Cancer) (Individual Genius-Helping)
- 1990 The Human Genome Project, led by Watson, set out to map the location of every single one of the 30,000 genes in the 23 chromosomes of every cell in the body. The project involved 18 teams of scientists and the first draft was produced in 2000.



- Scientists have now been able to develop certain genes that pass on hereditary conditions. As a result, there are new techniques for skin grafts, better production of insulin and better vaccines.

Lifestyle Factors as a cause of disease

- A healthy diet, exercise and other lifestyle factors have long been suggested as ways to prevent illness, however it was only in the 20th Century that lifestyle choices were linked to certain health conditions,

1. Smoking leads to lung cancer
2. Obesity increases the chance of heart disease or diabetes
3. Drinking too much alcohol have been linked to liver disease
4. Overexposure to ultraviolet radiation can lead to skin cancer.

Developments in Diagnosis

- Blood tests were first introduced to test **blood groups**. Blood tests were used to diagnose a range of diseases such a cholesterol levels, whether patient has cancer or to check a patients DNA etc. They make diagnosis more accurate.
- The use of medical scans began in 1895 when Wilhelm Röntgen discovered X-rays.
- Advances in computers led to ultrasound scanning using high frequency sound waves.
- CT scans were invented in 1972 and MRI scans were invented in the 1970s. They use powerful radio waves to construct images.
- Patients can also now monitor their own body with inventions such as the blood pressure monitor and blood sugar monitors.

Knowledge Check 4.1. Ideas about the causes of disease and illness

1. **Identify two other factors as well as bacteria that could lead to disease**
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   -
2. **Which two people are credited with discovering DNA in 1953?**
   -
3. **Identify two examples of lifestyle factors that could lead to disease.**
   -
   -
4. **What did Wilhelm Röntgen discover in 1895?**
   -
5. **Name two other scanning devices used in medicine**
   -
   -
6. **Name two types of monitors that patients can use to monitor their own health.**
   -

Key Topic 4.2 Approaches to prevention and treatment c1900-present.

National Health Service

- At the start of the 20th century access to healthcare was limited. Poor people could afford to go to the doctor to buy medicine.
- In 1901 there were 140 infant deaths for every 1000 births - but today it is less than 5.
- The NHS was introduced in 1948 after WW2. It is a nationalised healthcare system in the United Kingdom. It comprises of free at the point of access medical care in Hospitals, Accident and Emergency units, via General Practitioners (GP's) and via health visitors.

- Patients do not pay for emergency treatments, medical advice, periods in hospital or medical tests.

What problems has the NHS experienced?

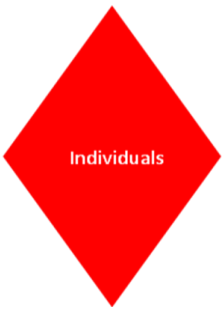
- The main problem that the NHS has encountered is its own size. The costs of the NHS has proven to be an issue of great concern ever since the services was introduced.
- Other problems have arisen in terms of staffing and availability of beds for patients, along with arguments about the cost of new drugs and treatments and waiting times.

Development of new drugs

Magic Bullets In this period scientists developed first cures for people who have already become sick with diseases.

Vaccines only prevent people getting them. Magic bullets attacked the bacteria developing in the body – made from chemicals and called sulphonamide drugs.

- 1909 Paul Ehrlich (who had been part of Koch's research team) developed the first chemical Salvarsan 606 which destroyed the harmful bacteria that caused syphilis. It



took a number of attempts to find the magic bullet (over 606) and in the end it was lucky it was retested by Dr Hata as they hadn't notice Salvarsan 606 worked the first time. (Individual Genius/Chance-Helping)

- In 1932 Gerhard Domagk developed Prontosil, the second chemical 'Magic Bullets' to cure blood poisoning or septicaemia. Scientists then discovered that the important chemicals in these cures was sulphonamide and drug companies produced more magic bullets for diseases such as pneumonia (Individual Genius-Helping)

***Antibiotics (bacteria which kill other bacteria)* for more detail see Key Topic 4.3a**

- Magic bullets could not kill staphyloccus germs which caused major infections and often killed the victims. This became a cause for particular concern due to the number suffering from it in World War I and World War II (War – Helping)
- The first antibiotic was called penicillin and was used to treat bacterial diseases.

Recent treatments

- Mass production of many drugs as treatments. (However, drugs have led to some problems such as thalidomide which was given to reduce morning sickness during pregnancy – led to children being born with severely deformed limbs)
- Development of customised drugs to cure one person's health problem
- Gene therapy – using genes from healthy people to cure the sick.

Knowledge Check 4,2. Approaches to prevention and treatment c1900-present.

1. In which year was the NHS introduced?
   -
2. Name two things NHS patients do not pay for
   -
   -

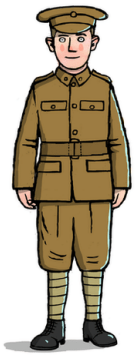
3. Identify two problems of the NHS
   -
   -

4. How is a Magic Bullet different to a vaccine?
   -
5. Name the person who developed Salvarsan 606
   -

6. What drug did Gerhard Domagk develop in 1932?
   -

7. What was the name of the first antibiotic?
   -

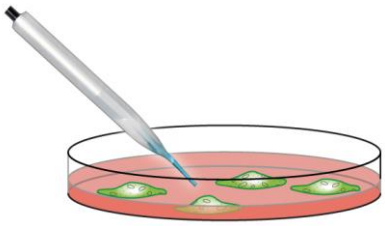
Key Topic 4.3a Key Individuals: Fleming, Florey and Chains development of penicillin



- Magic bullets could not kill staphyloccus germs which caused major infections and often killed the victims. This became a cause for particular concern due to the number suffering from it in World War I (War – Helping)

War

- 1872 Joseph Lister noticed mould of bacteria called penicillin killed other bacteria. Used this mould to treat a nurse with an infected wound but did not use it again.
- **Alexander Fleming** was a doctor who accidentally discovered a mould on a set of culture dishes, which were being used to grow the staphylococci germ (which turns wounds septic).



Fleming noticed that where there was mould the germs had stopped developing.

Individuals

- It was one of Fleming's colleagues who identified the mould as penicillin. Fleming subsequently tested the penicillin on animals, with no ill effects, and also used it to cure a colleague's eye infection.

Individuals

- After his initial discovery, Fleming did little more than keep a supply of the mould and return to his routine work. It was the scientists **Howard Florey** and **Ernst Chain**, who developed penicillin further.

- Florey and Chain were chiefly responsible for the research which led to its success as a drug, although Fleming took most of the credit for the discovery and its subsequent development.

- Fleming had discovered the first antibiotic.

However, it was not until the research work of Florey and Chain that penicillin could be produced as a drug. At first supplies of penicillin were very limited, but by World War II it was being mass-produced by the American drugs industry, and given to all soldiers before active service.

Knowledge Check 4.3a Key Individuals: Fleming, Florey and Chains development of penicillin

1. Why were Magic bullets good but limited?
   -
2. What did Joseph Lister notice in 1872?
   -
3. What did Alexander Fleming notice about mould in his culture dishes?
   -
4. What did Flemings colleague identify this mould as?
   -

5. Name the two scientists to developed Penicillin further
   -
   -

6. Who takes most of the credit for the devilment of the drug Penicillin?
   -
7. In which war did mass production of Penicillin help soldiers?
   -

Key Topic 4.3b Lung Cancer Depth Study (1900-present day)

Lung cancer has become more common since 1900 with over 40,000 new cases a year. It had become the second most common cancer and the leading cancer amongst women today. The rise of lung cancer deaths has also risen, peaking at 26,000 deaths in 1973

The link between Lung Cancer and smoking

In 1950, the British Medical Research Council proved that lung cancer was directly linked to smoking, indeed 85% of those get cancer are people who do or have smoked.

How diagnosis have improved in the modern age

Lung cancer is particular deadly, only 1/3 in live a year after their diagnosis so the focus on improving this.

Originally, X-rays were used to identify tumours with this was inaccurate.

Modern diagnosis

1. Patients are given a CT scan, often after being injected with a dye to create a more detailed picture.

Doctors then do one of two things

1. A PET-CT scan which uses radioactive material to identify specific cancerous cells
2. A bronchoscope takes a sample (biopsy) from the lungs

This allows the doctor to work out what treatment is best

As of 2015, there is currently no national screening programme as the technology simply does not exist to pick up the early signs of cancer

Modern treatment of Lung Cancer

Treatment has developed since the 1930s into four broad types:

Surgery

The earliest method which has developed with microsurgery. Lungs can also be transplanted but this leaves ethical questions.

Radiotherapy

Aims to kill the cancer cells using beams of radiation to target the cancer precisely.

Chemotherapy

Used since the 1970s is surgery and radiotherapy has not been successful. Chemical medicines are used to shrink tumours or or prevent cancer returning. It can have negative side effects.

Immunotherapy

Cancer can resist the bodies immune systems attempts to fight it, so scientists are researching into boosting a patients immune system to fight cancer.

However, As of 2016, there is NO cure for cancer

Modern prevention of Lung Cancer

The government were slow to intervene until lung cancer deaths grew too high and smoking related deaths cost the NHS £165m yearly.

Changing Behaviour

The government passed laws to force people to change their smoking behaviour:

- In 2007, smoking in public places was banned. This was extended to cars in 2015 as there was evidence passive smoking had a negative impact on health.
- Taxes on tobacco were increased
- Must be 18 to buy cigarettes, which cannot be on display

Influencing behavior

The government also aims to influence peoples behaviour to improve their lifestyle to reduce the chances of cancer.

- Advertisement was banned entirely from 2005 and packing now contains warning
- The NHS produced campaigns to advertise the dangers of smoking. This includes in education to stop young people smoking

Knowledge Check 4.3b Lung Cancer Depth Study

1. In what year did lung cancer deaths peak?
   -
2. What did the British Medical research Council prove about lung cancer in 1950?
   -
3. What percentage of people who get lung cancer smoke?
   -
4. Identify the four ways in which Lung Cancer can be treated
   -
   -
   -
   -
5. Is there a cure for Lung Cancer?
   -
   -
6. Why did the NHS decide to intervene in the prevention of Lung Cancer?
   -
7. What law was introduced in 2007?
   -
8. What was banned in 2005?
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