Superstition and Religion

In the **Middle Ages** the **Christian Church** taught that disease was a **punishment from God** for living a sinful life.

The Roman Doctor **Claudius Galen** believed that disease was caused by the **4 humours being unbalanced**. The church taught everybody to believe Galen as he had written that God had created human beings, so supporting their religious beliefs. You were punished if you criticised Galen.

Year 10

GCSE History – Assessment Point 2

Science and Technology

1864 – **Louis Pasteur** proved that his **'Germ Theory'** was correct after a series of experiments. **Bacteria is the true cause of disease.**

In 1928 **Alexander Fleming** made the chance discovery that bacteria could kill other bacteria when he discovered the first **antibiotic** called **Penicillin**.

Government

19th century - **French** government funded Pasteur's research and **German** government funded Koch's in order to achieve victory over their closest rivals!

20th century - **British** and **US** governments funded **Howard Florey and Ernst Chain** to mass produce huge amounts of **Penicillin** in order to heal injured soldiers during WW2.

Chance

Jenner discovered that the milkmaids he was treating had not caught smallpox after seeing the cowpox scars on their hands – **they'd accidently been vaccinated!**

Fleming left a sample of germs out in his lab near an open window. After coming back from holiday he realised a sample of new germs had settled on the petri dish and killed the germs – **Penicillin had been discovered!**

Time Period	Ideas about causes of disease
Middle Ages	4 Humours are out of balance. God sends disease as punishment, movement of the stars and planets affect people's health, Miasma.
Renaissance (Early Modern)	Miasma or bad air, 4 humours (still!) out of balance!
19th century	Spontaneous Generation (micro-organisms caused by decay), Germ Theory
20th century	Disease are caused by germs, some diseases have genetic causes (DNA)

The Role of the Individual

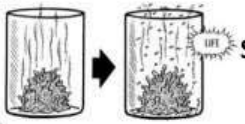
Edward Jenner realised that catching cowpox stopped you catching smallpox – but he couldn't explain why!

Louis Pasteur used his swan neck flask experiment to prove that germs cause liquids to become diseased.

Pasteur's 'Chicken Cholera' experiment proved that Jenner's vaccine worked after realising that those chickens not vaccinated died after being given a fresh sample of germs.

The Germ Theory

Scientists in the early 18th century no longer believed in the Four Humours or Miasma but with new powerful microscopes they could now see microbes (tiny organisms like bacteria) and they began to think of new ideas such as Spontaneous Generation.



Spontaneous Generation

Simply the idea that microbes were the product of decay (e.g. rotting food/waste) and they caused disease.

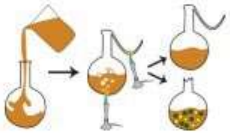
They did not think that it was actually microbes in the air that caused decay – it was wrong but still progress!

Louis Pasteur and the Germ Theory

In 1861, French scientist Louis Pasteur came up with the Germ Theory which challenged the idea of Spontaneous Generation and finally led the way to understand the true cause of disease!

Pasteur's theory claimed:

1. Microbes in the air cause decay
2. Microbes can be killed by heating them (Pasteurisation)
3. The air is full of microbes, which can cause disease



Pasteur had made a huge breakthrough! He had proved Germans were all around us, and some were harmful and could cause disease

Why was Pasteur so Significant

Pasteur proved this through his experiments on milk, beer and animals

Pasteur had little impact as doctors like Henry Bastian refused to accept that microbes like bacteria could make people ill, so they continued to believe spontaneous generation. It took a long time to convince people…

Robert Koch and the Germ Theory

Robert Koch
Father of bacteriology

I was able to develop Pasteur's ideas to **discover types of bacteria cause disease**. In 1876 I discovered the bacteria which caused Anthrax.

This was a major breakthrough – it was the first time anyone had identified a specific microbe (bacteria) that causes a specific disease)

I followed this by discovering the bacteria for Tuberculosis in 1882 and then Cholera in 1883 (proving John Snow right).

Koch published his methods of identifying disease causing bacteria

- It involved growing bacteria using agar jelly and a petri dish

- This would grow 'cultures' of pure bacteria, allowing Koch to identify specific bacteria causing disease

Koch had a serious impact:

- He invented a method to grow and stain bacteria to make them easier to identify
- Doctors now began to seek ways to to attack the microbe that caused disease, rather than just the symptoms. A huge turning point!
- He inspired other scientists to discover the causes of pneumonia and tetanus
- His methods are still used to this day.

Impact of the Germ Theory

1. The Germ Theory solved the ideas on what caused disease despite not everyone including the British government believing it. By the 20th Century, the Germ Theory was widely accepted.
2. Scientists now look at preventing disease causing microbes- through Jenner's vaccinations and antiseptics, whilst new treatments could be developed with this new understanding.

Middle Ages Surgery

How did they deal with PAIN?

- Patients were usually **awake** during the operation!
- Might be given **herbal drinks** or simply given much **alcohol**!
- Surgeons had to be **quick.**
- Patient might be **tied or held down.**

How did they deal with INFECTION?

- **Honey, vinegar and wine** were used to clean wounds.
- **Boiling oil** was poured onto wounds to kill the infection caused by gunpowder
- Most surgeons believed Galen was right when he said that **pus was a sign of a wound healing**!

What types of surgery did they use?

- Developed '**Bradmore's Screw**' – tool used to remove arrow heads from injured soldiers by it into the wound to pull the arrowhead out!
- **Bleeding** - to restore the balance of the 4 Humours.
- **Amputating** – lots of amputating!
- **Cauterised wounds** to stop bleeding by burning the flesh – extremely painful and usually resulted in death!

A lot of Middle Ages surgery was performed on battlefields – no wonder the survival rate wasn't huge!

What types of surgery did they use?

- **Barber-Surgeons** would cut your hair. give you a shave and perform basic surgery!
- They could **remove (tumours)** and **amputate limbs.**
- Some surgeons **still bled** patients to balance the humours!

Surgery in the early 19th century (1800-1850)

An operation in the early 1800's. Patients were usually awake during the surgery whilst a team of surgical assistants held them down!

How did they deal with PAIN?

- Patients are **still wide awake** during the surgery!
- Most patients are **given alcohol** to numb the pain
- Surgeons still **rely on speed**.
- **Accidents happened** – another surgeon accidently removed his patients testicles by working too fast.

How did they deal with INFECTION?

- **Still no understanding of germs** (until the 1860's)
- Surgeons operated wearing **surgical gowns covered in blood** from previous operations.
- **Rarely washed hands**.
- Surgical tools were also **rarely cleaned** of infection.