BBC BITESIZE

How did pioneering medical developments change patient care?

Alice: Hello! You're listening to the Bitesize GCSE History podcast with me, Alice Loxton.

Anouska: And me, Anouska Lewis! We're two history podcasters here to help you through your GCSE exam on the History of Medicine.

Alice: In this series, you might hear actors reading real historical accounts or imagined conversations based on historical evidence. And stay tuned for the quiz at the end.

Anouska: If you want to hear other episodes in this Bitesize GCSE History series, make sure you download the BBC Sounds app. We've now made it to the 19th century, Alice. Cities are growing, the industrial revolution is here, and petticoats are all the rage.

Alice: The influence of religion is decreasing, and people are looking to science for answers about medicine. There's a lot still to learn.

Anouska: We start this story at the very end of the 18th century, in 1796 to be precise, with a discovery that would go on to save thousands of lives.

Actor: You've heard of big pox. You've heard of medium pox. Now introducing smallpox.

Alice: A scientist called Edward Jenner has created a vaccine to stop people catching smallpox, which was a deadly disease that killed thousands of people. But how did he do it?

Jenner: Hello! Edward Jenner here, and do I have a story for you! I was working as a country doctor in Gloucestershire, when I noticed that milkmaids who caught cowpox, a mild disease transmitted from cows, never caught smallpox. How curious I thought! I wondered if cowpox could prevent smallpox. But I needed to test it. I took a sample of cowpox from an infected milkmaid and inserted it into a healthy boy's body. He experienced some mild symptoms but then, you'll never believe it, he made a full recovery! Later, when I exposed him to smallpox, he didn't catch the disease.

Anouska: Success! Jenner realised that by inserting cowpox into humans, he could protect them from smallpox. He called this method vaccination, from 'vacca', the Latin word for cow.

Alice: But Jenner didn't really know why the vaccine worked. That discovery would come later.

Anouska: 35 years after Jenner's discovery, a huge outbreak of disease began in Britain. It was the year 1831 when the disease cholera arrived. People could die really quickly from it, some in less than a day.

Alice: As cities had grown, so had populations. Overcrowding meant hygiene was poor, and there was more waste being left in the streets.

Anouska: Let’s hear a letter printed in The Times newspaper in 1849. It was written by a group of residents in Soho, London during the second cholera outbreak.

Actor: We live in muck and filth. We ain’t got no privies, no dust bins, no water supplies and no drain or sewer in the whole place. We all of us suffer and if the Cholera comes, Lord help us.

Anouska: So, we know that conditions were poor in the city and people were worried.

Alice: John Snow, a doctor working in London, discovered the cause of cholera. He noticed that people drinking from a particular water pump near his office were all becoming unwell.

Anouska: He discovered that sewage had been leaking into it, proving that contaminated water caused cholera. But he didn’t yet understand why. This is where Louis Pasteur comes in.

Alice: Weird question Anouska, have you ever smelt a carton of milk to check if it's okay to drink?

Anouska: Many, many times. And when it smells bad, it is gross.

Alice: It is. It sours, doesn't it. Well, Louis Pasteur was a French scientist with an interest in fermentation. And in the mid-1800s, he was investigating why drinks go bad and how to prevent this from happening.

Anouska: I'd grab a pen to make some notes for this section. During the 19th century - that's the 1800s - Pasteur used better microscopes to observe the microbes within liquids that would cause them to go off.

Alice: This discovery became known as 'germ theory.' The word 'germ' comes from the idea that these microbes appeared to grow, or 'germinate'.

Anouska: Pasteur conducted experiments to figure out why this happens. He would heat liquids to a certain temperature to kill the microbes within and stop liquids from going off. This became known as pasteurisation.

Alice: So, Louis Pasteur introduced pasteurisation. And if germs could make food and drink go bad, he thought they might also cause disease in humans.

Anouska: Pasteur's ideas weren't immediately accepted in Britain, but there were some scientists who took his research a step further. Joseph Lister, a surgeon from Scotland, read Pasteur's germ theory and felt inspired.

Alice: He experimented with applying carbolic acid to wounds, dressings and surgical instruments. And he discovered this killed germs and reduced the chances of patients dying from infection.

Anouska: Joseph Lister had created the first ever antiseptic and he published his results in 1867. This led to huge changes in surgery.

Alice: Operating theatres and hospitals were kept really clean, staff wore face masks and gloves, and surgical instruments were sterilised with antiseptic.

Anouska: Lister documented the death rate of amputations. From 1864 to 1870, the death rate dropped from 46% to 15%, thanks to the use of antiseptics.

Alice: Which is pretty incredible. Another breakthrough in surgery came from James Young Simpson, who created the first successful anaesthetic in 1847.

Anouska: He used chloroform as pain relief, to help women in childbirth and patients having painful operations.

Alice: And it got the royal seal of approval when Dr John Snow, who we heard about earlier, gave it to Queen Victoria during the birth of two of her children.

Koch: Hallo, mein Name ist Robert.

Anouska: That's Robert Koch, a scientist who built on Pasteur's germ theory. Tell them about yourself Robert!

Koch: Well, I'm a German doctor and I was very influential in the field of bacteriology, which is the study of bacteria. I discovered that different germs can cause different diseases.

Alice: So, Koch developed a way of growing bacteria with agar jelly in a Petri dish. He then used a dye to stain the bacteria so it could be seen with a microscope.

Anouska: With this method, individual bacteria could be identified, leading to the discovery of the bacteria that cause anthrax in 1876,

Alice: The bacteria that cause tuberculosis in 1882,

Anouska: And the bacteria that cause cholera in 1883.

Alice: It was now accepted that bacteria caused disease, so the next step was to work out how to remove the bacteria when someone was ill.

Anouska: But that's still a way off. It wasn't until after 1900 that effective treatments were developed.

Alice: Well, you can't rush genius! Listen to our episode on modern medical advances for that. But in the meantime, let's look at how care and treatment changed in this period.

Anouska: For many of us today, the hospital is where we go when we're unwell and need help.

Alice: But it hasn't always been that way. Before the development of antiseptics by Joseph Lister and hospital hygiene measures, people would sometimes become more unwell, or even die, in hospital.

Anouska: Overcrowded wards, poor toilets, and a lack of cleanliness meant infection was rife.

Alice: But in the mid 1800s an English nurse called Florence Nightingale sought to improve hospital conditions.

Nightingale: Hello, I'm Florence and I've always seen nursing as my calling. In 1853, I was a senior nurse in London when something very big happened.

Alice: She's right. In 1853, Britain went to war with the Russian Empire in Crimea.

Anouska: During the Crimean War, there was national outcry about the condition of army hospitals. So, Florence Nightingale convinced the British government to send her out to care for injured soldiers.

Alice: She was horrified by the conditions. Medical staff were overworked, there wasn't enough food or medicine, and the hospitals were dirty, leading to unnecessary infections.

Anouska: Nightingale worked hard to improve conditions, including making sure there was regular hand washing,

Alice: regularly cleaning wards,

Anouska: making sure bedding was clean and good meals were provided,

Alice: and making improvements to ventilation and sewerage. So, what difference did these measures make?

Anouska: Well amazingly, within six months, the number of injured soldiers dying in hospital fell from 40% to just 2%. Nightingale returned to Britain a national hero.

Alice: Florence Nightingale's impact on nursing was huge. She influenced the way hospitals were designed. For example, she recommended that new hospitals be built with plenty of windows to let in fresh air.

Anouska: She also influenced training. In 1860, she set up the Nightingale Training School for Nurses at St Thomas' Hospital in London and brought more respect to the profession of nursing.

Alice: Another nurse who made a big impact during the Crimean War was Mary Seacole.

Anouska: Born in Jamaica, she travelled to Britain and volunteered to help injured soldiers in Crimea.

Alice: However, the British War Office refused her application, so Seacole paid for her own travel to Crimea. She established the British Hotel and treated wounded soldiers on the battlefield.

Anouska: What a go-getter!

Alice: Soldiers affectionately called her 'Mother Seacole'. I recommend checking out our episode on pioneering women in medicine. You can listen on the BBC Sounds app - just search for Bitesize GCSE History.

Anouska: You know what time it is! It's time for a quick quiz to see how much we can remember!

Alice: Feel free to pause this whilst you write down your answers. First up - who invented the first vaccine, which was used to cure smallpox? The answer is Edward Jenner. He discovered that inserting cowpox in a human could prevent smallpox.

Anouska: Next question - which theory did Louis Pasteur discover? It's germ theory! He discovered the link between germs and disease.

Alice: Medical developments have made a huge difference to the way patients receive care, haven't they Anouska?

Anouska: They really have. Remember, you can listen to these episodes as many times as you need. And there are Bitesize podcasts on other subjects like English and science, just head to the BBC Sounds app.

Alice: We'll see you next time.

Anouska: Bye!