Three amazing medical breakthroughs you may not know about

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The collaboration between scientists in producing a vaccine for Covid-19 shows how medical discoveries change people's lives all the time.

As well as the research that's taken place to tackle Coronavirus, there's a chance you may have been told about penicillin, insulin and the smallpox vaccine at school.

But there are also breakthroughs and research that we may not necessarily have heard about before, but still have the potential to change patients' lives. Bitesize contacted three medical researchers and asked what they would put forward as discoveries which may not be well-known, but are still amazing.

The new antibiotic - from a medieval recipe

from Dr Freya Harrison, University of Warwick

Scientists looking for new antibiotics have a problem. Established drugs can become less effective if bugs and germs build up a resistance to them. It means they look into all sorts of places to find new chemicals that will kill bacteria, such as ants' nests, the depths of the sea - and even in the microbes in our noses.

But one surprising place that experts have been turning to for inspiration is medieval manuscripts, and the remedies our ancestors used. Even if Dr Harrison's predecessors may not have had the depth of knowledge about diseases that her team does, there is still a chance that their cures for illness contained molecules that could be effective today.

Scientists are looking into medieval texts to find methods and ingredients for 21st Century antibiotics

Dr Harrison explained: “For the last six years, we have been working on a medieval English remedy for eye infections.

“This is made from a mixture of plants, wine and cow’s bile, and we have found that it has very promising antibacterial activity in the lab."

The team's laboratory research has involved observing the effects of the remedy on animals and people wearing a small dose of the mixture on their arm.

Dr Harrison continued: “What is intriguing is that no single ingredient in the remedy has this activity – by combining the different ingredients, the doctor who created this remedy did a very interesting chemistry experiment that produced a bacteria-busting mixture.

“We are now working to find out exactly what molecules are responsible for this activity, and to see if this remedy could be developed into a new treatment for antibiotic-resistant infections."

It is thought the medieval treatment could help people with infected wounds or burns, and researchers are continuing to explore the historical medical books, to see which other methods could benefit patients today.

Running could generate new neurons in the brain

from Dr Daniel Berg, University of Aberdeen

Neuroscientists estimate that the human brain contains around 100 billion neurons, sending and receiving electrical signals to each other. They are made by something called neural stem cells.

In a recent discovery, scientists have found that the part of the human brain responsible for learning and memory - the hippocampus - contains neural stem cells, which create around 700 neurons every day. These neurons are vital for our moods, helping us remember new memories and find our way around new places.

In order to study the production of neurons, scientists observed - under laboratory conditions - how they were created naturally in the hippocampus of animals. This included letting them exercise freely, which activated the stem cells and led to more neurons being produced, improving their mood and memory.

Dr Berg said about the new research: “Scientists are now trying to find ways to use the neural stem cells to repair the brain after injury or disease. If we could stimulate and guide the neural stem cells that already are in the brain and get them to replace the lost neurons, this would improve the life of many patients.”

Surgeons can operate on patients who are miles away from them

From Professor Roger Kirby, President of the Royal Society of Medicine

We may associate robots operating on people with sci-fi blockbusters, but they have been around since the late 20th Century. Their potential was recognised by both NASA and the US military, who worked together on a version in the early 1990s that could see surgeons operating on patients who were many miles away from them.

Fast forward 30 years, and there are more than 80 surgical robots in the NHS, helping surgeons perform more than 15,000 cancer operations each year. A surgeon has complete control over the robot and using them allows greater accuracy in keyhole surgery. In turn, this means patients can recover more quickly.

The surgeon in the foreground is operating the robot performing on the patient in the background

Professor Kirby said: "Robotic surgery gives the surgeon doing the operation amazing vision, precision and control compared with surgery using traditional instruments and procedures. With the extraordinary magnification and amazing dexterity that these robots offer, it's almost as if you've got your own hands inside the patient.

"The surgeon sits in a chair and puts their head in a view finder with 3D binocular view and **10x magnification**. Using fingertip controls, the surgeon operates multiple robotic arms with tiny articulated 'wrists' that go inside the patient's body to do the dissecting and **suturing**. The instruments are so precise that stitches are the width of a hair."

Most of the UK operations carried out by robots are by surgeons who specialise in **urology**, on parts of the body which include our kidneys and bladders.

It requires special training and surgeons go through simulations to help them learn the new skills and procedures.

Prof Kirby added: "Today surgeons can do operations using surgical robots without touching the patient or even being in the same room, town or country."