INVESTIGATING THE LINK BETWEEN GUT MICROBES AND THE BRAIN AFTER A STROKE

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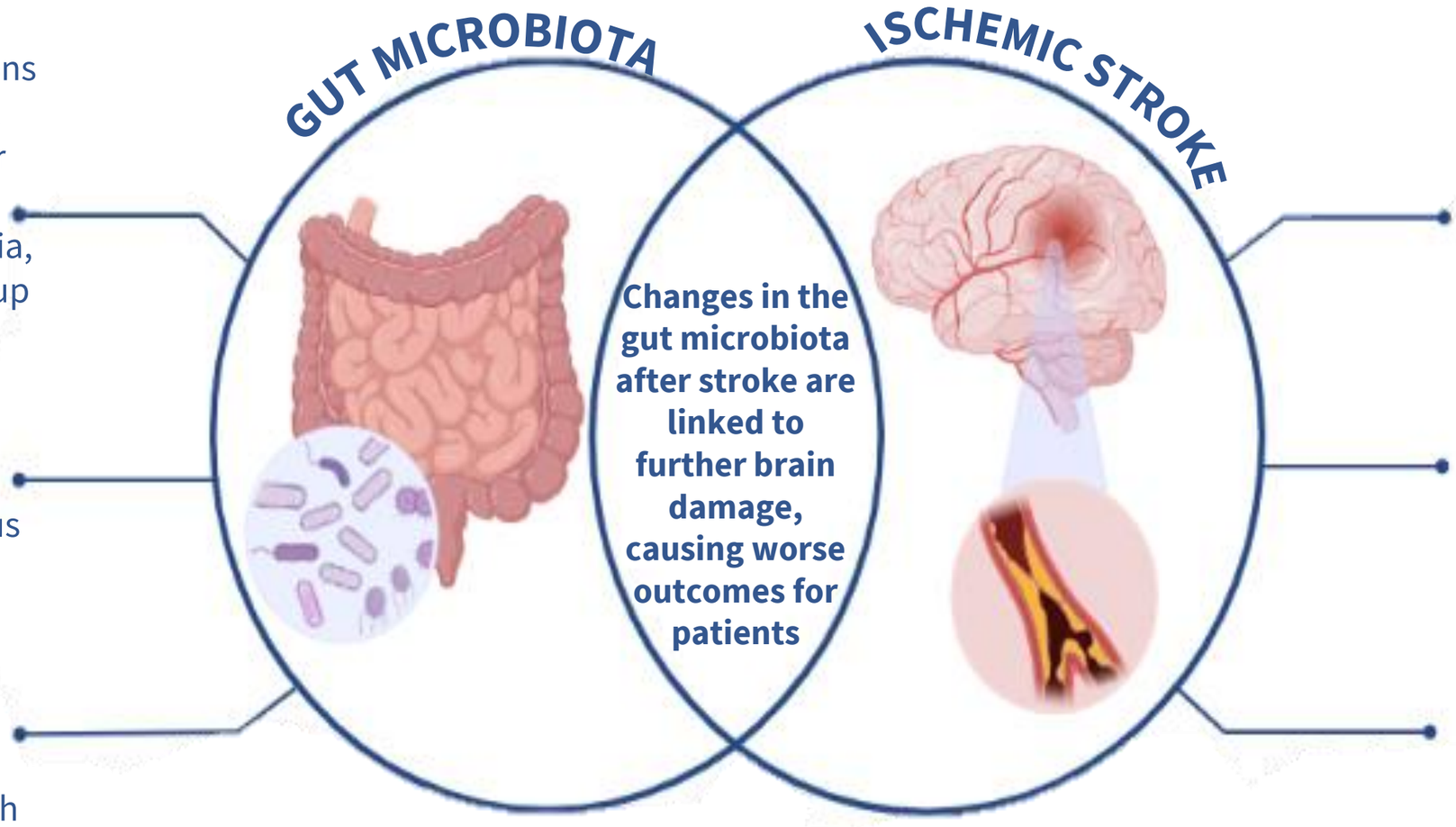
Our gut is home to trillions of **microorganisms**, 10x greater than the number of cells in our body! The different types of bacteria, viruses and fungi make up the **gut microbiota**.

Most of the microorganisms are **beneficial**, helping us digest food, protecting us from infection and regulating our immune system.

The microbiota and the brain can **communicate** with one another through different pathways.



Stroke is the 2nd most common cause of death in the world, with **24.9 million cases each year.**

The most common type of stroke is an **ischemic stroke,** where a blood vessel in the brain becomes **blocked**, meaning the cells in the brain cannot get oxygen and nutrients and will eventually die.

In the UK, the number of people suffering from a stroke is **predicted to increase** by 60% between 2015 and 2035.

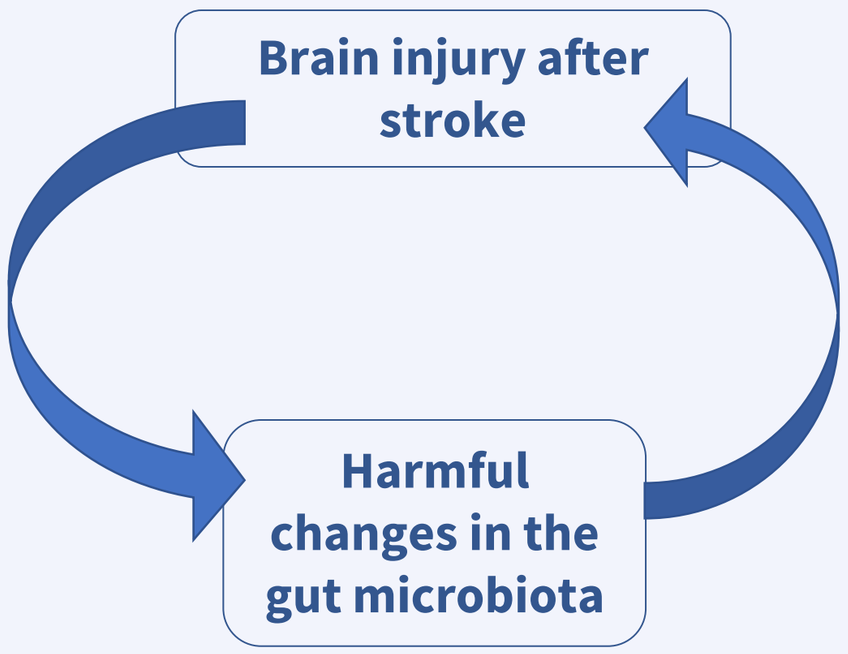
HOW DOES A STROKE AFFECT THE MICROORGANISMS IN OUR GUT?

- Studies have shown that after a stroke, there is also **less blood flow in the intestine**, which is one of the major organs in our digestive system. This leads to changes in the number and types of microorganisms in the gut.

- For example, one study showed stroke patients had less beneficial bacteria, such as the *Faecalibacterium* and *Lachnospira,* and **more harmful bacteria**, including Enterobacteriaceae.

- Following brain damage, **signalling to the gut is also affected**, which can have a number of harmful consequences. For example the wall of the intestine, may begin to breakdown. This means microorganisms in the gut, normally protected from other organs, can escape, causing **infection**.

- An increase in harmful bacteria can cause **abnormal changes in the body's immune functions**, including the repair and healing of the damaged brain after stroke.



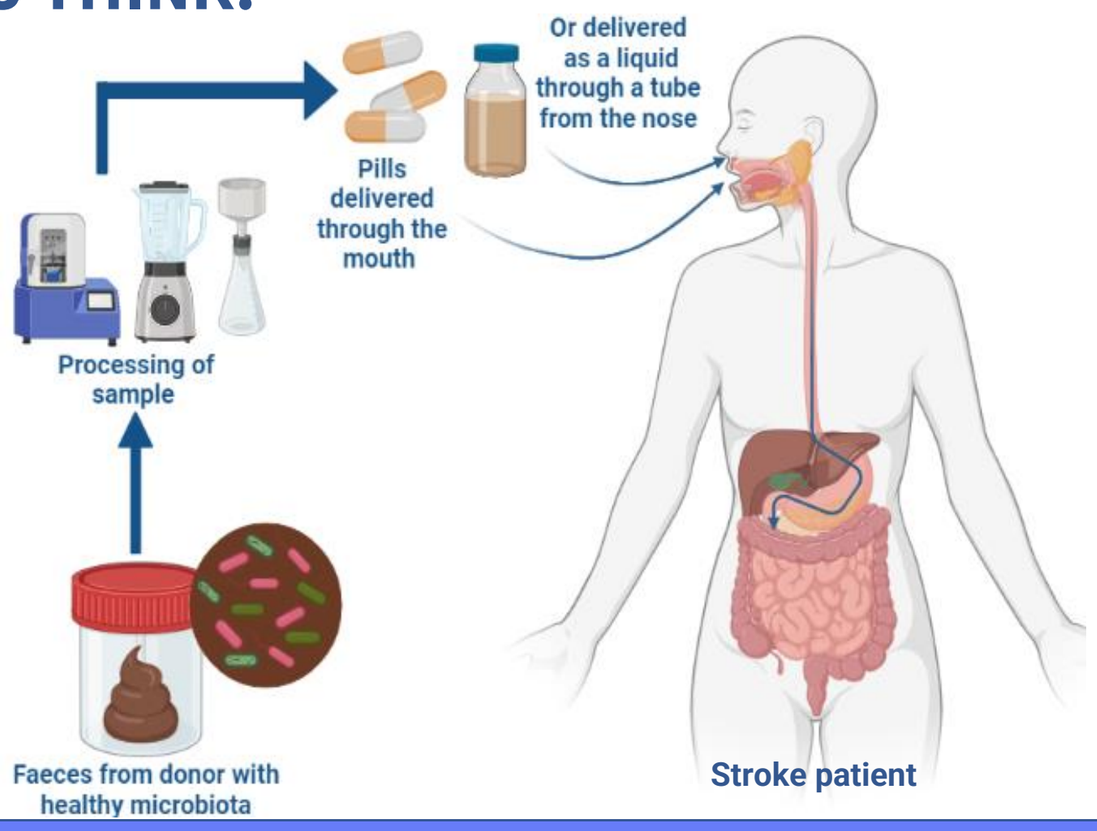
YOUR FAECES ARE MORE IMPORTANT THAN YOU THINK!

- You may be thinking is there any way of reversing the damage to the gut microbiota after a stroke to prevent further damage? Well… the answer may lie in your faeces!

- A **faecal microbiota transplantation (FMT)**, involves purification of faeces from a healthy person, collecting only the contents of their gut microbiota. This is then transferred to the patient.

- In animal models of stroke, an FMT **improved the balance of the gut microbiota**. This led to **reduced brain injury**, better recovery times and an increase in the number of beneficial immune cells.

- However, before it can be approved as a standard treatment for stroke, it **must be trialled in patients** to understand it's safety and whether it will provide long-term benefits.



CONCLUSION

- An ischemic stroke causes changes in the gut microbiota, which can add to brain injury.
- So far, many of the studies looking at this link have been in animals. Therefore, more human studies are needed to understand exactly how the brain and gut communicate after a stroke.
- Research in this area could help us develop new treatments for ischemic stroke, such as a faecal microbiota transplantation.

References

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