

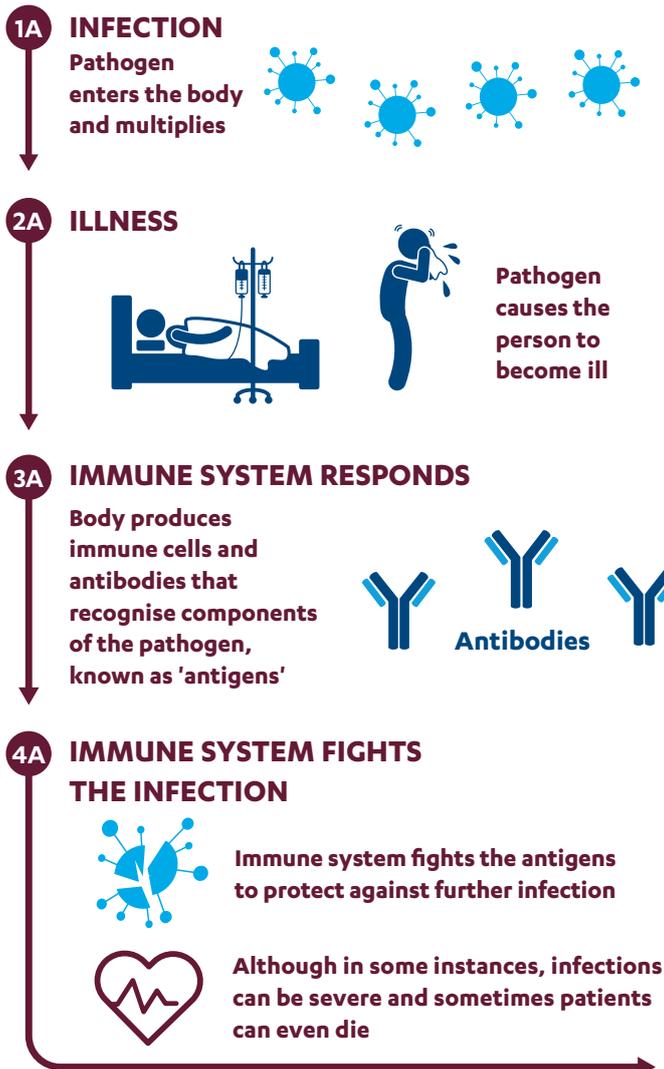
# HOW VACCINES WORK



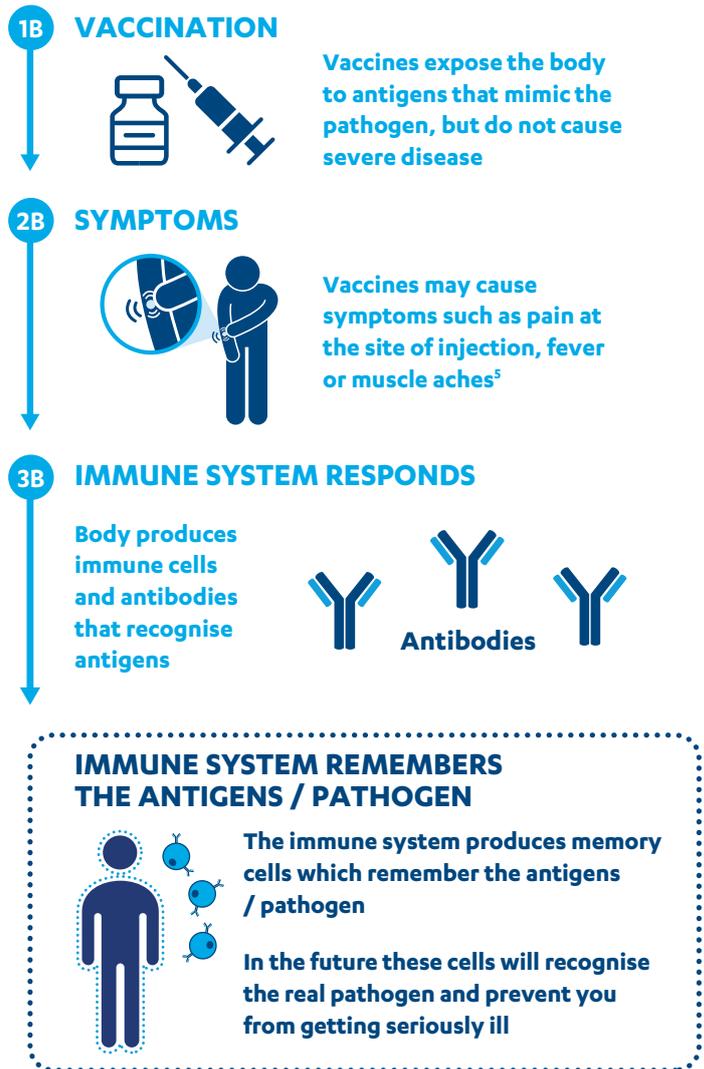
Through effective vaccination programmes we have seen a great reduction in disease burden, with vaccines saving up to 2-3 million lives every year.<sup>1</sup> It remains evermore important that we ensure the uptake of vaccination continues, to allow many more lives to be saved.

Vaccination is one of the most successful public health interventions.<sup>1</sup> It allows the immune system to develop protection against certain illnesses by exposing the body to antigens (a substance foreign to the human body that induces an immune response) which mimic (components of) a pathogen (a bacterium, virus, or other disease-causing microorganism), but does not cause severe disease.<sup>2,3,4</sup>

## HOW THE IMMUNE SYSTEM PROTECTS US FROM DISEASE<sup>2,3,4</sup>



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## HOW THE IMMUNE SYSTEM PROTECTS US FROM DISEASE<sup>2,3,4</sup>

- 1A** When the body is infected with a harmful virus or bacterium (collectively called pathogens) for the first time, the immune system can take several days to recognise and respond to the infection. During this time, the pathogen is able to multiply in the body.
- 2A** As the pathogen multiplies, the infection can spread and cause the person to become ill.
- To protect the body against the infection, the
- 3A** immune system recognises parts of the pathogen, known as ‘antigens’, as foreign and produces immune cells and antibodies to protect the body against the disease.
- 4A** These antibodies fight the antigens and protect against further infection. However, the first time the body faces a particular antigen it can take several days to produce this antibody response which can lead to death if the immune system is not quick enough to fight back.

## HOW VACCINES PROTECT US FROM DISEASE<sup>2,3,4</sup>

- 1B** Vaccines enter the body and expose it to antigens which mimic (components of) the pathogen, but do not cause severe disease. This enables the body to be introduced to the pathogen, without making the person seriously ill.
- 2B** In most cases, vaccines only cause symptoms, such as pain at the site of injection, fever or muscle aches.<sup>5</sup> These side effects may affect your ability to do daily activities, but they should go away in a few days. Some people have no side effects.<sup>5</sup>
- 3B** When a person is vaccinated, the immune system will recognise the antigens as foreign and mount an immune response against them by producing immune cells and antibodies, similar to a natural infection.

**As a result of exposure to both natural infection and vaccines, memory cells are created. Memory cells ensure that the immune system recognises the pathogen during a future (real) infection, and responds faster. In this way, the immune system is primed to fight off the infection before you get seriously ill.<sup>2,3,4</sup>**

**“ Vaccines. With the exception of safe water, no other modality, not even antibiotics, has had such a major effect on mortality reduction.<sup>6</sup> ”**

Susan & Stanely Plotkin

**FOR MORE INFORMATION ABOUT VACCINATION, PLEASE SPEAK TO YOUR DOCTOR.**

**References:** **1.** World Health Organization. Immunization. Available at: [www.who.int/news-room/facts-in-pictures/detail/immunization](http://www.who.int/news-room/facts-in-pictures/detail/immunization). Accessed: September 2021. **2.** Understanding how vaccines work. Available at: <https://www.cdc.gov/vaccines/hcp/conversations/understanding-vacc-work.html>. Accessed: September 2021. **3.** Live Science. How Do Vaccines Work? Available at: <https://www.livescience.com/32617-how-do-vaccines-work.html>. Accessed: September 2021. **4.** Children's Hospital of Philadelphia. Making Vaccines: How Are Vaccines Made? Available at: <https://www.chop.edu/centers-programs/vaccine-education-center/making-vaccines/how-are-vaccines-made>. Accessed: September 2021. **5.** Centers for Disease Control and Prevention. Possible Side Effects After Getting a COVID-19 Vaccine. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/expect/after.html>. Accessed: September 2021. **6.** Plotkin SL, Plotkin SA. A short history of vaccination. In: Plotkin S, Orenstein W, Offit PA. Vaccines. 5th edition. Page 1. Philadelphia: Saunders, 2008.

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