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What are the benefits of mixing and matching COVID-19 booster vaccines?

With cases of COVID-19 rising in the UK, people who are eligible are being urged to get their booster vaccines. Some people may receive a different vaccine from the one they had for their previous jabs. But is this safe – and are there any advantages to mixing and matching vaccines?

People who are most at risk are eligible for a COVID-19 booster jab on the NHS. All adults aged 65 years and over are being offered the vaccine automatically.

As of September 2023 you can only get the COVID-19 vaccine from the NHS if you meet certain criteria. You cannot buy it privately.

The following groups can have a booster vaccination this autumn:

Residents in care homes for older adults.

Adults aged 65 years and over.

People aged six months to 64 years in a clinical risk group.

Frontline health and social care workers.

People aged 12 to 64 who are household contacts of people with weakened immune systems.

People aged 16 to 64 who are carers and staff working in care homes for older adults.

Pregnant women.

Mixing and matching COVID-19 booster jabs

When you have your booster jab, you'll be given a vaccine made by Pfizer, Sanofi or Moderna – and it might not be the same brand of vaccine you've had before. But experts say mixing and matching which jabs you have is common and may give you more protection against the virus.

William Schaffner, a professor of preventive medicine at Vanderbilt University, says mixing and matching for booster jabs is becoming more common for two reasons. "The most important reason is that mixing offers advantages in enhanced immune response and, therefore, anticipated enhanced protection. The [immune](#) response after mixing is often higher than after matching," he says.

"There is a relatively small advantage to mixing the two mRNA vaccines (Pfizer and Moderna). However, there is substantial enhanced immunogenicity – a measure of how well a vaccine works – when the vector-based Johnson & Johnson vaccine (similar to the AstraZeneca vaccine) is followed by an mRNA vaccine."

The second reason is convenience. Mixing [COVID-19](#) vaccines is emerging as a good way to get people the protection they need when faced with unpredictable supplies. "The individual may find that their most convenient vaccine provider has a [vaccine](#) different from the individual's first dose – just easier to mix rather than to match," says Schaffner.

Why mixing vaccines can trigger a stronger immune response

Multiple studies have shown that mixing and matching [COVID-19](#) jabs is safe – it can also be more effective than having the same vaccine for each dose.

Rodney E. Rohde, a professor of clinical laboratory science and an infectious disease specialist at Texas State University, says: "Research and global real-time data have shown mixing and matching as an approach for [COVID-19 vaccination](#) is safe. In some cases, it can even be more effective than not mixing. It can show a very strong 'boost' effect."

In other words, mixing and matching vaccines can produce a stronger antibody response than sticking with the same vaccine for all doses. The exact reason why combining vaccines might improve efficacy is unknown, but we do know that [vaccines](#) present the same information in different ways.

For example, mRNA vaccines teach cells how to make a similar protein that triggers an immune response if someone gets infected. Vector-based vaccines such as AstraZeneca use a modified version of a [virus](#) that is different from the [virus](#) being targeted, in order to present part of the spike protein from the surface of SARS-CoV-2 – the virus that causes COVID-19 – to our immune systems. The Sanofi vaccine is protein-based and contains copies of the SARS-CoV-2 spike protein from the Beta variant.

It is thought that when combined, these differences might kick start different parts of the immune system or trigger a stronger immune response. This may make immunity last longer too.

A study by Umeå University in Sweden showed a 67% lower risk of infection for the combination of the AstraZeneca vaccine followed by the Pfizer jab, compared to people who hadn't been vaccinated¹. This compared to a 50% reduction among people who had the Oxford jab twice.

Meanwhile, having the AstraZeneca vaccine followed by Moderna – another mRNA vaccine – cut the risk of infection even more sharply, by 79%.

Stronger antibody response

Other studies have found that mixing [COVID-19](#) vaccines can produce a stronger immune response. A Spanish study reported that people who initially received the AstraZeneca vaccine experienced a significant increase to their antiviral immunity when given a second dose of the Pfizer vaccine².

"A National Institutes of Health study³ tested nine different combinations of Johnson & Johnson, Moderna and Pfizer vaccines given to 458 participants and found that mixing was safe and highly effective," says Rohde.

"The concise story of this study shows that receiving a booster shot greatly increased the circulating number of antibodies including neutralising antibodies – molecules that bind to the virus and stop it from infecting cells – against [SARS-CoV-2](#)."

Should vulnerable people mix and match COVID-19 vaccines?

The priority for everyone, especially vulnerable people, is to be fully vaccinated against COVID-19. People who are eligible for their booster are being encouraged to get it as soon as possible.

"The most important thing is for people to be vaccinated," says Rohde. "Those initial vaccines are critical to help reduce the ease at which [SARS-CoV-2](#) can find a host. The more we can enhance immunity in the global population, typically the more we can reduce the virus from easily mutating.

"We may not stop it, but we can reduce the danger and slow down the mutation. [Immuno-compromised](#) and others in high-risk work groups – for example, healthcare workers – are among those most strongly recommended to get vaccinated, when the time comes, to be boosted."

Further reading

1. [Nordstrom et al: Effectiveness of heterologous ChAdOx1 nCoV-19 and mRNA prime-boost vaccination against symptomatic Covid-19 infection in Sweden: A nationwide cohort study.](#)
2. [Borobia et al: Immunogenicity and reactogenicity of BNT162b2 booster in ChAdOx1-S-primed participants \(CombiVacS\): a multicentre, open-label, randomised, controlled, phase 2 trial.](#)
3. [Atmar et al: Heterologous SARS-CoV-2 booster vaccinations – Preliminary report.](#)

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