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Covid-19: Longer interval between Pfizer doses results in higher antibody levels, research finds

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An interval of at least six weeks between the two doses of the Pfizer-BioNTech covid-19 vaccine increased concentrations of neutralising antibodies, research funded by the Department of Health and Social Care for England has found.¹

The preprint, released on 23 July, looked at immune responses in 503 healthcare workers who had received the Pfizer vaccine. It found that, after the second vaccine dose, neutralising antibody concentrations were higher after an interval of 6-14 weeks than after the 3-4 week regimen that was initially recommended.

When looking at the delta variant, researchers also noted that, though there were good levels of antibodies after the shorter dosing interval, levels were 2.3-fold higher with the longer dosing interval.

The researchers said the findings “indicate that extension of the dosing interval is an effective, immunogenic protocol.”

The UK extended the dosing interval for covid-19 vaccines as part of its decision to accelerate population coverage with a single dose. At the time, evidence indicated that the Oxford-AstraZeneca vaccine was more effective with a longer dosing interval but the effect was less clear with the Pfizer vaccine.²

Speaking at a Science Media Centre briefing, study joint chief investigator Susanna Duanchie, from the University of Oxford, said that an eight week interval was the “sweet spot.” But she added that the Pfizer vaccine was “very good at inducing immune responses no matter what regimen you get. So both the short and the long dosing regimen give a good response of both antibodies and T cells.”

The Protective Immunity from T cells to Covid-19 in Health workers (PITCH) study, which is being carried out across five UK universities and NHS trusts, in collaboration with Public Health England, also found that four weeks after the first dose of vaccine there was a “marked decline in SARS-CoV-2 neutralizing antibody levels, but, in contrast, a sustained T cell response to spike protein.”

Duanchie said, “After the first dose, if you’re on the long dosing interval, you’re neutralising antibodies do wane over the 10 weeks while you’re waiting for the second dose, particularly to the delta virus, but the T cell response is well maintained.

“Comparing the long and the short dosing interval, we saw that neutralising antibodies were about twofold higher after the second vaccine—the longer dosing interval gave slightly lower T cells when we look at those effector killer cells compared with the short regimen. But when we look in more depth at the character of the T cells, we find that the long dosing interval gives rise to T cells which are more typical of helper T cells and long term memory T cells that promote memory and generation of antibodies.”

1 Payne RP, Longest S, Austin JA, et al. Sustained T cell immunity, protection and boosting using extended dosing intervals of BNT162b2 mRNA vaccine. https://www.pitch-study.org/PITCH_Dosing_Interval_23072021.pdf.

2 Iacobucci G, Mahase E. Covid-19 vaccination: What’s the evidence for extending the dosing interval? *BMJ* 2021;372:n18. doi: 10.1136/bmj.n18. pmid: 33408068