PROTECT THE COMMUNITY YOU Love!

COVID-19 VACCINE INFO

SOUTHWESTERN Public Health
Oxford • Elgin • St.Thomas

Implementing COVID-19 Vaccination: Vaccine Dose Interval

Background:

An efficient vaccination roll-out is especially paramount as hospitals fill up and new variants of concern emerge. If we are to contain and control the virus, we must ensure the vaccines are not only safe, but also effective and widely available. With vaccines currently being in short supply, scientific experts are investigating the question, how much can we alter the published dosing regimen while maintaining its effectiveness? Since the Pfizer-BioNTech and Moderna vaccines are the first mRNA vaccines to be widely used, little is known about their long-term efficacy or the effect of off-label dosing schedules (1).

What dosing schedules for COVID-19 vaccines are approved based on clinical trial data?

- Both BioNTech and Moderna are approved by Health Canada for use as a 2-dose schedule given either 21 days (Pfizer-BioNTech)(1,2) or 28 days (Moderna) apart (3).
  Pfizer-BioNTech: Following first dose, partial immunity is granted against severe COVID, typically within 7 days, with 52.4% efficacy between 7-14 days, 89% between days 15-21 post-dose 1 and continues to climb to 92.6% in the first week after the second dose (1). Of note, single-dose efficacy was not a primary outcome of the trial, but rather extrapolated by subgroup analysis and thus based on fewer data (1,2)
  Moderna vaccine: Showed 50.8% efficacy of the first dose on day 1-14 and 92.1% efficacy ≥ 14 days post-dose 1 (80.2% overall post-dose 1) (3,4). No clinical trials have looked at how long immunogenicity lasts following one dose but what we do know is that efficacy after the first dose increases with time until the second dose is administered.

What data exist on deviations from approved dosing schedules?

- Unpublished data from Pfizer-BioNTech and Moderna dosing interval trials are the only trials to date that demonstrate patient level data on longer dosing intervals (5).
- Based on unpublished data available to the National Advisory Committee on Immunization (NACI) through Health Canada for both the Pfizer-BioNTech and Moderna vaccines, there was no difference in vaccine efficacy between the people who got their second dose at day 19 and the people who got it at day 42 (5). Importantly, there was no decrease in protection between the first dose and the second dose.

What has the National Advisory Committee on Immunization concluded?

- Within the limitations of currently available data, while the second dose should be given according to the approved schedule if possible, jurisdictions may consider delaying the second dose due to logistic or epidemiologic reasons until further supplies of the vaccine become available, preferably within 42 days (6 weeks) of their first dose (5).
- This interval increase is expected to yield similarly high protection seen with second dose administration at 21 or 28 days after the first dose (5).

- This is consistent with recommendations released on January 8, 2021 by the World Health Organization that provides flexibility to extend the dose interval up to 42 days in circumstances of vaccine supply constraint and high disease burden (6).

What do Canada's Chief Medical Officers of Health recommend?

- Canada's Chief Medical Officers of Health support NACI's recommendations (7).
- Health Canada is committed to evaluating the impacts of extending the dosage intervals, working together to monitor vaccine effectiveness and overall safety, and investigating and reporting any adverse events. They commit to use these data, along with data from international studies, to guide decisions going forward (7).
- Where it is necessary for programs to extend the dose interval beyond 42 days based on specific epidemiology and impacts, those programs must monitor the impact closely and share results regularly to add to the developing evidence base (7).

What specific directive has Ontario's Chief Medical Officer of Health given?

- Extend doses up to 42 days for some recipients of Pfizer-BioNTech (8):
    - Long-term care residents, high-risk retirement home residents and their essential caregivers, and concurrently vaccinated staff: second dose of Pfizer-BioNTech vaccine in 21 to 27 days. All other recipients of the Pfizer-BioNTech vaccine: second dose 21-42 days (8).
    - Moderna vaccine: 28 days (8).

Bottom Line:

- There are inadequate vaccine supplies to maintain the maximum rate of primary vaccinations while adhering to strict approved dosing schedules for those that have already received the first dose.
- Partial immunity is granted after the first vaccine dose, as demonstrated in clinical trials.
- This immunity does not appear to wane for the duration studied (up to 42 days).
- There is no obvious biological basis to believe that the long-term efficacy of the booster dose will be negatively affected by a short delay in receiving it.
- Ongoing research is indicated.

References:

1. Polack FP, Thomas SJ, Kitchin N, et al. Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. NEJM epub 2020;383:2603-2615. Accessed Jan 31, 2021. https://www.nejm.org/doi/full/10.1056/NEJMoa2034577

2. FDA: Vaccines and related biological products advisory committee briefing document. Accessed Jan 31, 2021. https://www.fda.gov/media/144246/download

3. Baden LR, Sahly HM, Essink B, et al. Efficacy and safety of the mRNA-1273 SARS-CoV-2 vaccine. NEJM epub 2020 Dec 30. Accessed Jan 31, 2021. https://www.nejm.org/doi/full/10.1056/NEJMoa2035389

4. Public Health England - The Green Book - The latest information on vaccines and vaccination procedures, for vaccine preventable infectious diseases in the UK. Accessed Jan 31, 2021. https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book#the-green-book

5. Government of Canada. Recommendations on the use of COVID-19 vaccines. Updated Jan 12, 2021. Accessed Jan 31, 2021. https://www.canada.ca/en/public-health/services/immunization/national-advisory-committee-on-immunization-naci/recommendations-use-covid-19-vaccines.html

6. World Health Organization Interim recommendations for use of the Pfizer– BioNTech COVID-19 vaccine, BNT162b2, under emergency use listing. Interim guidance. 8 January 2021. Accessed Jan 31, 2021. https://www.who.int/publications/i/item/WHO-2019-nCoV-vaccines-SAGE_recommendation-BNT162b2-2021.1

7. Statement from the Council of Chief Medical Officers of Health--Implementing COVID-19 Vaccination in Canada—Vaccine Dose Interval. 14 January 2021. Accessed Jan. 31, 2021. https://www.canada.ca/en/public-health/news/2021/01/statement-from-the-council-of-chief-medical-officers-of-health-implementing-covid-19-vaccination-in-canada--vaccine-dose-interval.html

8. Ontario achieves key milestone with vaccinations in long-term care. News release Jan 19, 2021. Accessed Jan 31, 2021. https://news.ontario.ca/en/release/60011/ontario-achieves-key-milestone-with-vaccinations-in-long-term-care