

Public health statement on deferral of second dose of COVID-19 vaccine in BC

Updated 3 March 2021

Summary:

There is strong scientific evidence from clinical trials and real world experience to support deferral of the second dose of COVID-19 vaccine. We currently have a limited supply of COVID-19 vaccines and ongoing community transmission, but we have only protected a small proportion of the population to date. Providing a first dose now to as many people as possible will save more lives and avoid more cases and hospitalizations and support a return to essential functions in our communities. This aligns with recent recommendations from the Canadian National Advisory Committee on Immunization. A two-dose vaccination series remains important to provide long-term protection.

Situation:

- Transmission of SARS-CoV-2 continues in BC. There is minimal population immunity, leaving the vast majority of the BC population susceptible to COVID-19.
- [Priority groups](#) are at increased risk of serious health outcomes and death following a COVID-19 infection.
- Our current COVID-19 vaccine supply is insufficient to vaccinate everyone in the priority groups if we hold back vaccine doses so that each individual receives 2 doses within 42 days.

What we know about vaccines in general:

- It generally takes at least 2 weeks to mount an immune response to a vaccine dose.
- For most vaccines, the first dose contributes the most towards short-term protection. Additional doses extend protection over the long-term and are often given months or even years apart.
- For most vaccines, antibody levels decline gradually over time and do not suddenly fall below protective levels. Even months or years later, another vaccine dose can boost antibodies to higher levels.
- For many vaccines, a longer interval to the second dose results in higher antibody levels. High antibody levels are associated with longer duration of protection.
- Generally, vaccine manufacturing companies and national vaccine advisory bodies specify a *minimum* interval between vaccine doses but do not specify maximum intervals. Delay in receipt of a scheduled dose does not require restarting a series.

Clinical trial data for COVID-19 vaccines that have been approved in Canada:

- Both mRNA vaccines approved for use in Canada have high ($\geq 94\%$) efficacy against COVID-19 disease after the second dose; both vaccines are also highly efficacious after the first dose, at least in the short term (see Table). The second dose provides very little additional short-term benefit for either vaccine.
- Moderna vaccine efficacy is reported as 92% in the period from day 14 after dose 1 up to administration of dose 2.

- Pfizer-BioNTech vaccine efficacy is [estimated as 93%](#) in the period from day 14 after dose 1 up to administration of dose 2.
 - Pfizer reported vaccine efficacy of 52% from day 1 after dose 1 to before dose 2. This is an important reminder that it takes time for the full immune response to be mounted. Therefore, the risk of acquiring COVID-19 does not drop immediately after vaccination with the first dose (in the clinical trials, most COVID-19 infections were observed in the *first* 14 days, and would have included individuals who were infected and incubating the virus just prior to receiving the vaccine).
- The interval between the first and second doses was not studied for long periods in most clinical trials and thus the optimal interval between doses remains unknown.
- The duration of protection is unknown for either single or two-dose regimens since studies have only lasted a few months to date.
- Not everyone in Pfizer’s and Moderna’s clinical trials received the second dose vaccine exactly on schedule. The per-protocol analyses allowed an interval of up to 42 days after the first dose. Therefore, reported results reflect vaccine administration within and beyond the recommended 21-28 day schedule.
- AstraZeneca vaccine, made using a different technology but also requiring a two-dose regimen, was recently approved in Canada.
 - One-dose AstraZeneca vaccine efficacy is 76% from day 22 up to day 90 after dose 1, but varied by the time interval between the two doses.
 - Delaying the second dose to ≥ 3 months after the first dose [led to higher vaccine efficacy](#) compared with administration of second dose within 6 weeks of the first (82% compared with 55%), suggesting improved response with a longer interval between doses.

Table. Summary of reported and estimated vaccine efficacy for two COVID-19 vaccines currently approved in Canada

Vaccine	Efficacy (protection against COVID-19 disease)	
	14 days after dose 1 and before dose 2 (95% CI)	>7-14 days after dose 2 (95% CI)
Pfizer	Estimated 93% (69–98%)	95% (90–98%)
Moderna	92% (69–99%)	94% (89–97%)
Astra-Zeneca	76% (59-86%)*	67% (57-74%)

CI=confidence interval; * from day 22 up to day 90 after dose 1

Vaccine effectiveness based on real-world data for COVID-19 vaccines that have been approved in Canada:

- In Canada, early vaccine effectiveness [results from BC](#) show that the first mRNA vaccine dose reduced the risk of COVID-19 in long-term care residents and health care workers by 80% within 2-3 weeks of receiving the shot. Recent data from [QC](#) demonstrate similar results.
- Globally, early data from [England](#), [Scotland](#), [Israel](#), and the [US](#) on the effectiveness of the vaccines show a strong level of protection, especially against more severe outcomes, following the first dose, albeit somewhat lower than what is reported based on clinical trial data.

- Lower vaccine performance based on data from real-world settings is typical and expected, generally reflecting different population demographics and health status profiles as well as multiple sources of bias compared with controlled clinical trial conditions.
- There is no indication that protection after the first dose declines rapidly over time.
- Overall, there is a growing body of scientific evidence that deferral of the second dose for a few months after the first dose does not lessen vaccine effectiveness and the level of protection remains high.

BC's current approach:

- In line with the [recommendation](#) by the Canadian National Advisory Committee on Immunization (NACI), the current approach aims to balance limited supplies with minimizing serious COVID-19 related outcomes in the population.
- At this point in the epidemic, when we have only protected a small proportion of the population, providing a first dose to as many people as possible will save more lives and avoid more cases and hospitalisations than providing a second dose to a smaller number of people.
- On balance, the deferral of the second dose is sound public health policy in the context of limited supply and relatively high community prevalence.
- A two-dose vaccination series remains important to provide long-term protection.
- Evaluation of the protection from COVID-19 vaccination will continue. Internationally, clinical trials will continue to follow vaccine recipients for at least 2 years.
- In Canada and BC, vaccine effectiveness will be assessed regularly and the approach to vaccination will be revisited as more scientific evidence becomes known and as vaccine supply increases.

How BC's approach aligns nationally and compares internationally:

- The [Canadian National Advisory Committee on Immunization](#) has recommended that Canadian jurisdictions should extend the interval for the second dose to 4 months.
- In the [UK](#) and [Quebec](#), the practice of deferral of the second dose up to 12 weeks/90 days (or even later) after the first dose has already been in place for a few months.
- [European Medicines Agency](#) and [World Health Organisation](#) recommend or support deferral of the second dose up to 6 weeks.
- The [US Centers for Disease Control and Prevention](#) has recommended that manufacturer's schedule should be followed whenever possible (21 days apart for Pfizer vaccine, 28 days apart for Moderna vaccine), but administration of second dose could be deferred up to 6 weeks.

Clinical Note

You are the head of an emergency department of 100 staff. You know that vaccine protection in the short term exceeds 80% whether you get one dose or two doses. We don't know how long protection lasts thereafter for either one or two doses, but the pandemic risk is elevated now. We have enough vaccine supply now to give you 100 doses. We expect to get more doses later. Based on the above, how would you allocate those 100 doses: would you give one dose to all 100 staff who would get 80% protection or two doses to 50 staff who would get 90% protection?

*Option 1 (single dose) would leave 20 of your staff unprotected (i.e. $100 * 0.20$);*

*Option 2 (two dose) would leave 55 of your staff unprotected (i.e. $50 + 50 * 0.10 = 55$).*