

Maximizing Doses of Pfizer-BioNTech COVID-19 Vaccine

Last Updated 03/05/2021



Consistently maximizing doses per vial of COVID-19 vaccines is essential to administering vaccines to more people. Selection of syringe and needle as well as technique for preparing doses to optimize vial pressure is key to maximizing doses for each Pfizer-BioNTech COVID-19 Vaccine vial. [The USP COVID-19 Vaccine Handling Toolkit: Operational Considerations for Healthcare Practitioners](#), offers considerations to ensure complete doses are withdrawn and additional safe practices. Visit www.usp.org/covid-vaccine-handling to learn more.

Syringe and Needle Type

Maximize doses withdrawn from vials (at least 6 doses) by utilizing low-dead volume (LDV) syringes/needles whenever possible. Practice settings that may not have adequate quantities of LDV syringes can maximize doses by utilizing a combination of LDV and non-LDV syringes (e.g., 3 LDV syringes and 3 non-LDV syringes). The ratio of LDV to non-LDV syringes should be dependent on the type of syringe and needle used. Additional considerations to support dose optimization include:

- Use 1-inch needles, 21-gauge or narrower (e.g., 25-gauge), to withdraw vaccine.
- Use 1 mL syringes with 0.1 mL markings for accurate dose withdrawal.
- Use needle that is fixed to syringe, with safety mechanism.
- Use the correct needle gauge and length for the recipient patient based on age, gender and weight recommendations based on [CDC's Vaccine Administration: Needle Gauge and Length guide](#).

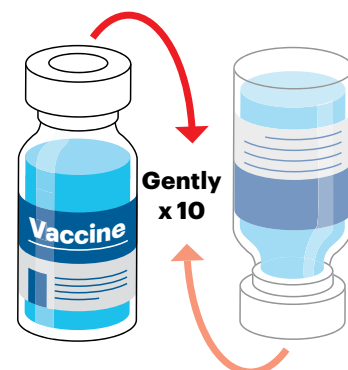
Preparing Pfizer-BioNTech COVID-19 Vaccine

The [Pfizer-BioNTech COVID-19 Vaccine resource webpage](#) provides preparation instruction that should be reviewed to ensure quality vaccine preparation. The following are additional considerations for withdrawing doses including optimizing vial pressure to ensure maximizing doses for each Pfizer-BioNTech COVID-19 Vaccine vial.

Follow aseptic technique throughout vaccine preparation.

Prepare for Dilution

- 1 A Pfizer-BioNTech COVID-19 vaccine vial must reach room temperature before dilution and be diluted within 2 hours of removal from frozen or refrigerated storage.**
- 2 Inspect liquid to ensure it is a white to off-white suspension which may contain white to off-white opaque amorphous particles.**
- 3 Invert vaccine vial gently 10 times. Do not shake.**

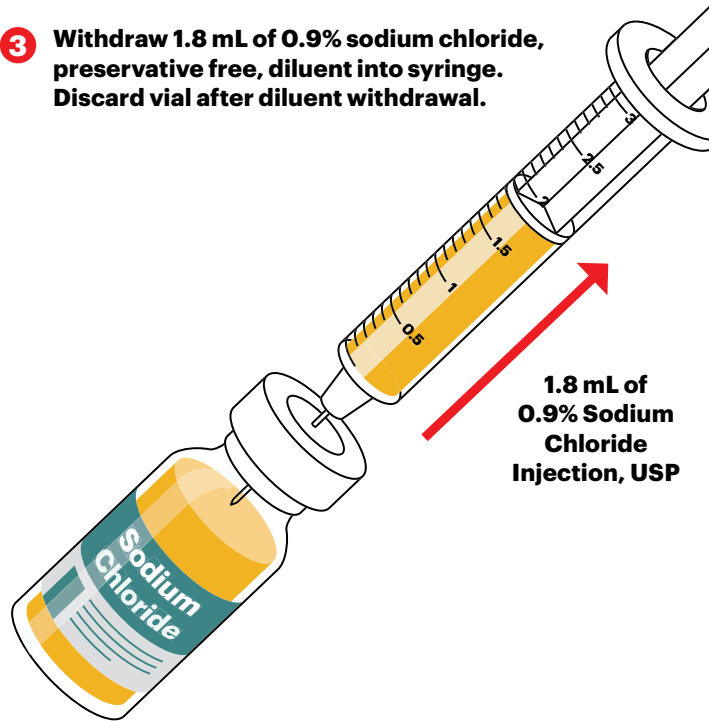


Continued on next page

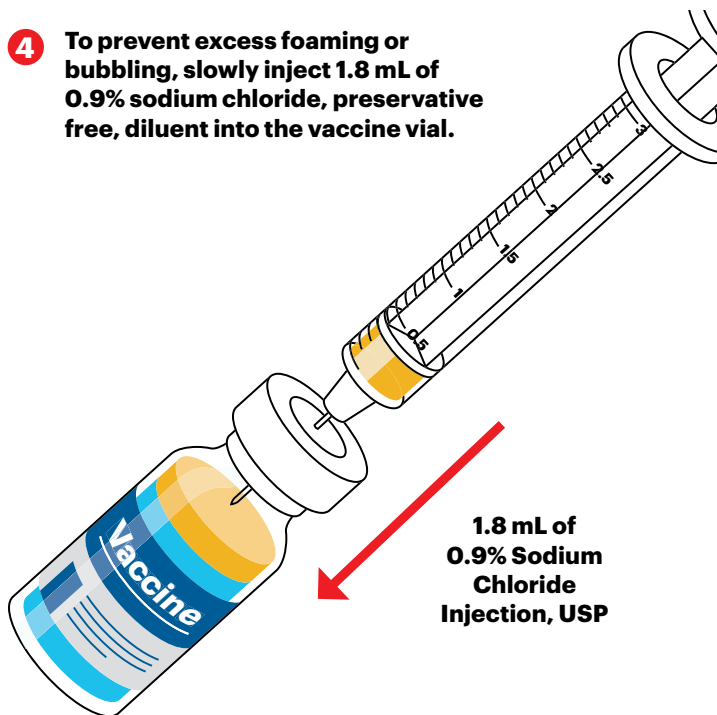
Preparing Pfizer-BioNTech COVID-19 Vaccine cont.

Dilute the vaccine

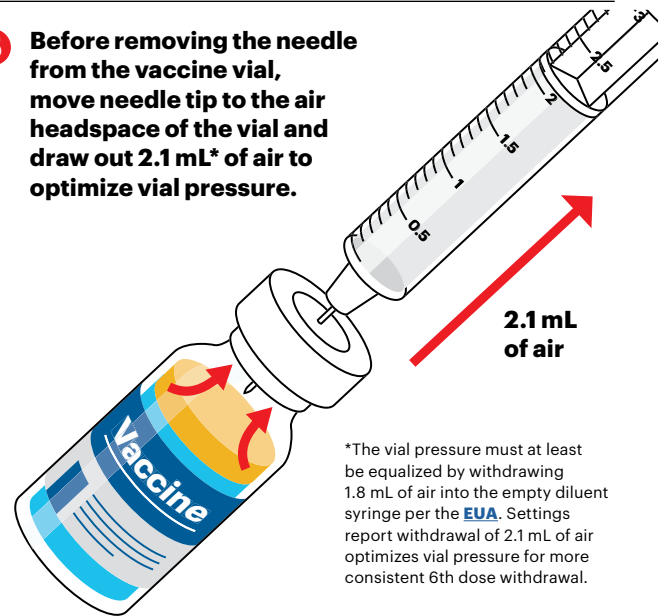
- 1 Wipe diluent vial stopper using sterile alcohol swab.
- 2 If applicable, ensure needle and syringe are tightly luer-locked together.
- 3 Withdraw 1.8 mL of 0.9% sodium chloride, preservative free, diluent into syringe. Discard vial after diluent withdrawal.



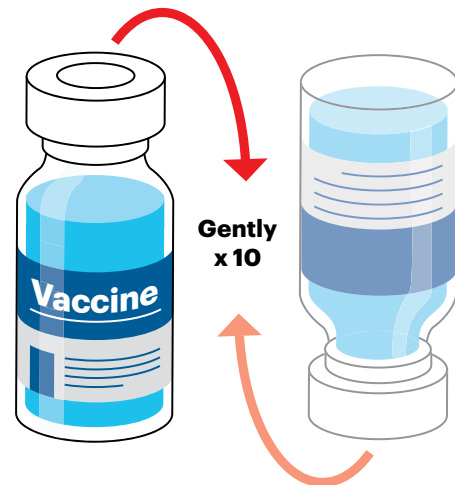
- 4 To prevent excess foaming or bubbling, slowly inject 1.8 mL of 0.9% sodium chloride, preservative free, diluent into the vaccine vial.



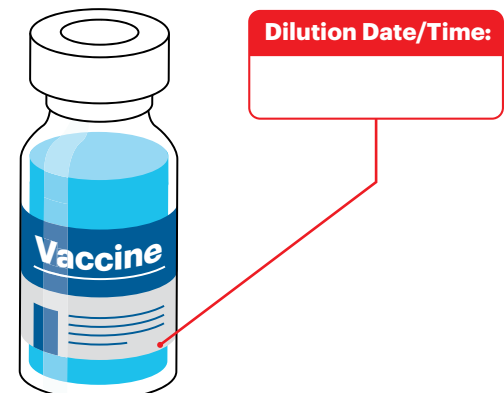
- 5 Before removing the needle from the vaccine vial, move needle tip to the air headspace of the vial and draw out 2.1 mL* of air to optimize vial pressure.



- 6 Gently invert the diluted vial 10 times to mix. **Do not shake.**



- 7 Record dilution date and time on vaccine vial and store diluted vaccine for up to 6 hours at 2°C to 25°C (35°F to 77°F).

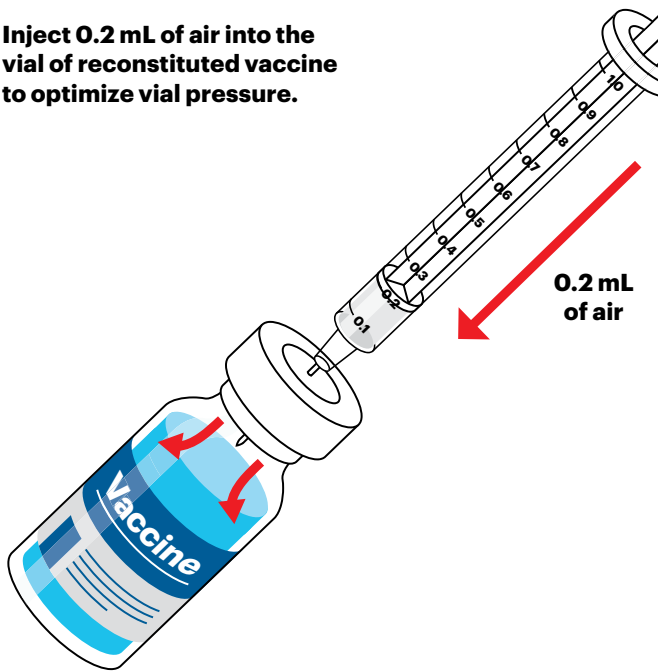


Continued on next page

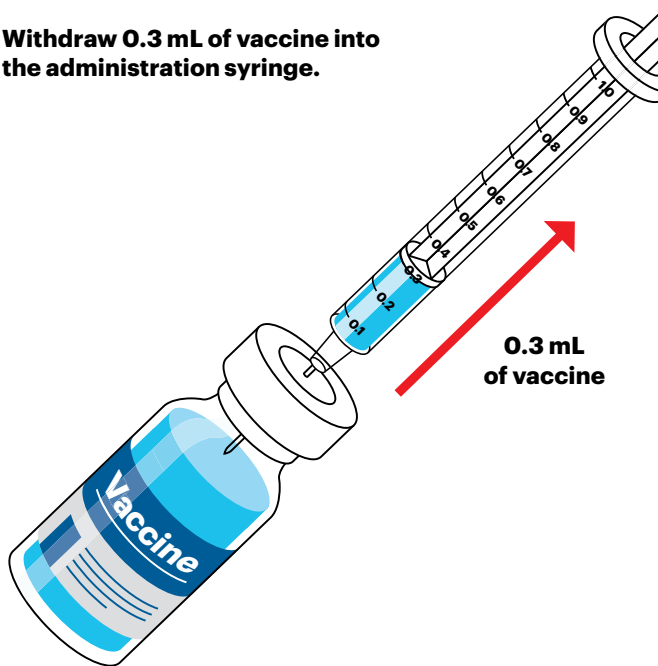
Preparing Pfizer-BioNTech COVID-19 Vaccine cont.

Draw up each dose of the vaccine

- 1 Wipe vaccine vial stopper using sterile alcohol swab.
- 2 If applicable, ensure needle and syringe are tightly luer-locked together.
- 3 Inject 0.2 mL of air into the vial of reconstituted vaccine to optimize vial pressure.



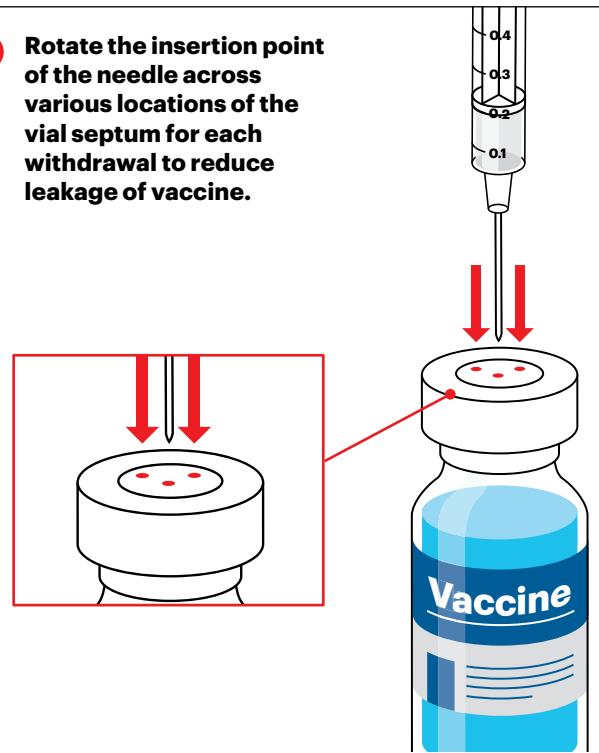
- 4 Withdraw 0.3 mL of vaccine into the administration syringe.



- 5 While small air bubbles can be ignored, large air bubbles can lead to underdosing and should be addressed. Minimize tapping of the syringe due to theoretical risk of inactivating the vaccine or degrading quality.

- 6 Utilize safe practices when recapping the needle after withdrawing and before administering.

- 7 Rotate the insertion point of the needle across various locations of the vial septum for each withdrawal to reduce leakage of vaccine.



This information will be updated as additional vaccines are authorized and other information becomes available.

Visit www.usp.org/covid-vaccine-handling for the latest and to sign up for updates.