COVID-19 Booster Doses – Which Vaccine Should I Get?

Who is eligible for a COVID-19 booster dose?

As of November 19, 2021, the CDC has expanded eligibility for COVID-19 booster doses in the United States. There are now booster recommendations for all three available COVID-19 vaccines in the United States:

- Individuals who are **12-17 years old** and initially received a **Pfizer-BioNTech** COVID-19 vaccine, should receive a single booster dose of Pfizer-BioNTech COVID-19 vaccine 5 months after the completion of their primary series. Only the Pfizer vaccine may be used for the booster dose in individuals 12-17 years old.

- Individuals who are **18+ years old** and initially received a **Pfizer-BioNTech** (mRNA) COVID-19 vaccine, should receive a single booster dose of an mRNA (Pfizer or Moderna) COVID-19 vaccine 5 months after the completion of their primary series.

- Individuals who are **18+ years old** and initially received a **Moderna** (mRNA) COVID-19 vaccine, should receive a single booster dose of an mRNA (Pfizer or Moderna) COVID-19 vaccine 5 months after the completion of their primary series.

- Individuals who are **18+ years old** and initially received the **Johnson & Johnson** COVID-19 vaccine, should receive a single booster dose of an mRNA (Pfizer or Moderna) COVID-19 vaccine is recommended 2 months after their primary vaccine.
    - On December 17, 2021, the CDC updated guidance regarding the Johnson & Johnson COVID-19 vaccine. The CDC now recommends the preferred use of mRNA (Pfizer or Moderna) COVID-19 vaccines and boosters over the use of the Johnson & Johnson COVID-19 vaccine and booster for all individuals 18 years and older.
    - This guidance applies to everyone unless an individual has a contraindication to mRNA COVID-19 vaccines (e.g., severe allergic reaction after a previous dose or to a component of an mRNA COVID-19 vaccine), if a person would otherwise remain unvaccinated for COVID-19 due to limited access to mRNA COVID-19 vaccines, or when a person wants to receive the J&J COVID-19 vaccine despite the safety concerns identified.

However, it is up to the health care provider and the patient to determine which COVID-19 vaccine brand is the best option for a booster dose. The CDC continues to allow for a "mix and match" approach to booster doses. Deciding which booster is right for you can be challenging. It is important that patients weigh the risks of severe illness from COVID-19 with the benefits and risks of vaccination. Below is some information to consider when deciding which booster to receive.

What are the benefits of a COVID-19 booster dose and risks of COVID-19 illness?

The benefits of a COVID-19 booster dose may include a reduced risk of SARS-CoV-2 infection (the virus that causes COVID-19) and a reduced risk for severe COVID-19. Receiving a booster dose may prevent

illness (including post-COVID/long-term symptoms) and may reduce transmission of the virus to other people. Individuals should consider the following risk factors for SARS-CoV-2 infection and the potential impact of SARS-CoV-2 infection:

- *Risk of exposure to SARS-CoV-2.* Factors that would be expected to affect the risk of exposure to SARS-CoV-2 include work or residence in certain settings; level of community transmission; rates of COVID-19 vaccination in their community; the likelihood of frequent interactions with possibly unvaccinated people from outside an individual's household, and adherence to recommended prevention measures.
- *Risk for developing SARS-CoV-2 infection*. A person's risk for developing SARS-CoV-2 infection may vary based on time from completing a primary COVID-19 vaccine series and time from prior SARS-CoV-2 infection due to waning immunity. Serologic testing or cellular immune testing is not recommended as part of the individual risk benefit assessment.
- *Risk for severe infection related to underlying conditions.* A person's risk of developing severe COVID-19 may vary by the type, number, and level of control of specific medical conditions as well as other yet to be defined variables. Pregnant people may receive a COVID-19 vaccine booster. Separately, also see Considerations for COVID-19 vaccination in moderately and severely immunocompromised people.
- *Potential impact of SARS-CoV-2 infection.* SARS-CoV-2 infections that are not severe may still lead to illness (e.g., post-COVID-19/long-term symptoms). A person's individual circumstances should also be considered; these may include living with/caring for a person who is medically frail or immunocompromised or a child who is not eligible for COVID-19 vaccine or the inability to work or meet other personal obligations when infected, even if not severely ill with COVID-19.

Are there any safety concerns with mixing brands for COVID-19 boosters?

There have been no safety concerns identified with mixing and matching products. Any side effects reported during booster studies appear to be limited to the same side effects seen after receipt of a homologous (same brand) series. The most common side effects include fatigue, headache, chills, and muscle aches.

How do COVID-19 boosters compare?

Data suggests that mixing COVID-19 vaccine brands boosts the immune response to the virus that causes COVID-19. Below is a summary of this study.

Initial Vaccine Administered	**Pfizer**			**Moderna**			**Johnson and Johnson (J+J)**		
Initial Number of Doses	2			2			1		
Booster Brand	Moderna*	Pfizer	J+J	Pfizer	Moderna*	J+J	Moderna*	Pfizer	J+J
Fold increase in neutralizing antibodies	17.3x	14.9x	6.2x	9.7x	7.9x	4.7x	56.1x	32.8x	4.6x
Rank	1st	2nd	3rd	1st	2nd	3rd	1st	2nd	3rd

Conclusion	While Moderna produces the best antibody response, receiving any dose of mRNA vaccine is effective at boosting a persons immune response.			While Pfizer produces the best antibody response, receiving any dose of mRNA vaccine is effective at boosting a persons immune response.			While Moderna produces the best antibody response, receiving any dose of mRNA vaccine is effective at boosting a persons immune response.		

**In this study a full dose of Moderna COVID-19 vaccine was used as the booster dose. A half-dose of Moderna COVID-19 vaccine is authorized in the United States for the booster dose.*

Are there any safety concerns for choosing a booster dose of the mRNA (Pfizer or Moderna) vaccine?

The serious safety concern seen most commonly with the mRNA vaccines (Pfizer and Moderna) is myocarditis (inflammation of the muscle around the heart). Based on current data from the primary vaccine series, the highest risk of myocarditis occurring following receipt of an mRNA vaccine is seen in males aged 12-30 years old. The rate of myocarditis occurring following receipt of an mRNA vaccine in males ages 18 – 24 years old is 39 cases per one million doses administered. Myocarditis is also associated with COVID-19 illness. Additionally, data suggests that myocarditis occurs at a higher rate following a COVID-19 illness compared to receipt of a COVID-19 vaccine. There have been no reported deaths associated with myocarditis following a COVID-19 vaccine. Most cases of myocarditis are mild and patients typically recover fully within 6 months.

Are there any safety concerns for choosing a booster dose of the Johnson and Johnson vaccine?

Yes. The CDC and the North Dakota Department of Health recommend that all individuals get vaccinated with an mRNA (Pfizer or Moderna) COVID-19 booster dose as soon as they are eligible. This guidance comes after reviewing data on the increased risk of Thrombosis with thrombocytopenia (TTS) and Guillain-Barré syndrome (GBS) associated with those who have received a Johnson & Johnson COVID-19 vaccine.

- Thrombosis with thrombocytopenia (TTS) is a serious, but rare, adverse event that causes blood clots with low platelets. As of December 8, 2021, more than 16.9 million doses of the J&J COVID-19 vaccine have been given in the United States. The CDC and FDA identified 57 confirmed reports of people who got the J&J COVID-19 vaccine and later developed TTS. VAERS reports have identified nine deaths that have been caused by or were directly attributed to TTS following J&J COVID-19 vaccination.

- Guillain-Barré syndrome (GBS), a rare autoimmune disorder, may be associated with the Johnson and Johnson COVID-19 vaccine. Through July 24th , 130 cases of GBS following vaccination have occurred, most frequently in males 50 years of age and older. The highest reporting rate of 16 cases per one million doses administered is in males ages 50 – 64. Older males may want to consider mRNA vaccination for their booster dose.

I need more guidance on choosing which COVID-19 booster dose to receive. Who should I talk to?

For specific medical questions, the North Dakota Department of Health recommends an individual talk to their trusted medical provider. This provider will be able to offer insight into a person's individual medical decisions.