



Addressing Concerns About COVID-19 Vaccine Side Effects

Note: While this section was written with COVID-19 vaccines in mind, many of the general principles apply to other vaccines as well. Individual vaccines may vary in their antigenic components or dosage forms, but the principles of human behavior and good communication skills transcend most differences between vaccines.

The Issue

Concerns about side effects of COVID-19 vaccines are one of the largest contributors to vaccine hesitancy. People are concerned about short-term side effects, serious adverse events, possible long-term adverse effects, and rumored effects with no basis in fact.

Sound Bites

- > Some people who receive COVID-19 vaccines experience predictable mild side effects. This is normal and means the vaccines are working to create an immune response.
- > Some people have no side effects from COVID-19 vaccination. Vaccination protects you from severe COVID-19 infection, whether or not you experience side effects.
- > Common side effects are pain, redness, and swelling in the arm where the shot was administered, as well as tiredness, headache, muscle pain, chills, fever, and nausea throughout the rest of the body.
- > Side effects after COVID-19 vaccination may affect your ability to do daily activities, but they usually go away in a few days.
- > Adverse effects that could cause a long-term health problem are extremely rare following any vaccination, including COVID-19 vaccination. If adverse effects occur, they generally happen within 6 weeks of receiving a vaccine dose.
- > None of the COVID-19 vaccines contain the live virus that causes COVID-19, so a COVID-19 vaccine cannot make anyone sick with the disease.
- > COVID-19 vaccines do not change or interact with a person's DNA in any way.



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Questions for Exploring Patient Concerns

- > What have you heard about possible side effects of COVID-19 vaccines? (If this is not the patient's first COVID-19 vaccination, what reaction, if any, did that person get after the previous vaccination?)
- > What is your understanding of [possible side effect/adverse event]?
- > What is your biggest concern about [possible side effect/adverse event]?
- > What would make you less concerned about [possible side effect/adverse event]?
- > What if I told you... *(Provide information or suggest possible actions that would alleviate the stated concern. For example, if the person is concerned about blood clots, explain why an mRNA vaccine would be a safer choice.)*

What We Know

When discussing the safety of COVID-19 vaccines, the CDC differentiates between side effects (representing predictable vaccine reactogenicity) and adverse events (health problems that occur after vaccination).¹ Although adverse events may be caused by a vaccine, they also may be caused by a coincidental event not related to a vaccine.

Predictable Common Short-Term Side Effects. Common side effects of COVID-19 vaccines include injection-site reactions (e.g., pain, redness, swelling on the arm where the shot was given) and systemic reactions (e.g., tiredness, headache, muscle pain, chills, fever, nausea).²

Importantly, some people have no side effects at all after COVID-19 vaccination. In one study conducted in the United Kingdom, only 25% of people who received an mRNA vaccine reported experiencing a systemic side effect, and 66% had an injection-site reaction.³ Women tend to report side effects more frequently than men do.⁴

Setting appropriate expectations is important. People contemplating vaccination should know which side effects to anticipate and understand why they occur (i.e., these side effects are normal signs that the body is building protection). People also should know that side effects may affect their ability to engage in usual daily activities, but the side effects usually go away in a few days.

Serious Adverse Events. Serious adverse events after COVID-19 vaccination may occur, but they are rare. The CDC provides updates on the following serious adverse events of interest⁵:

- > Anaphylaxis.
- > Thrombosis with thrombocytopenia syndrome (associated primarily with the Johnson & Johnson/Janssen vaccine, no longer distributed in the US).
- > Guillain-Barré syndrome (associated primarily with the Johnson & Johnson/Janssen vaccine, no longer distributed in the US).
- > Myocarditis and pericarditis (associated primarily with mRNA vaccines).

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Anaphylaxis. Severe allergic reactions, including anaphylaxis, can occur after any vaccination. Anaphylaxis after COVID-19 vaccination is rare and occurs in approximately 5 people per 1 million people vaccinated in the United States. If anaphylaxis occurs, vaccination providers can effectively and immediately treat the reaction.

Myocarditis and Pericarditis. Myocarditis is an inflammation of the heart muscle. Pericarditis is an inflammation of the lining outside the heart. In these cases, inflammation occurs in response to an infection or some other trigger. Though cases of myocarditis and pericarditis after COVID-19 vaccination are rare, when cases have occurred, they have most frequently been seen in adolescent and young adult males within 7 days after receiving the second dose of an mRNA COVID-19 vaccine; however, cases have also been observed in females, in other age groups, and after other doses.

The severity of myocarditis and pericarditis cases can vary; most patients with myocarditis after mRNA COVID-19 vaccination have experienced resolution of symptoms by hospital discharge.^{2,6}

Long-Term Adverse Effects. Adverse effects that could cause long-term health problems are extremely unlikely following any vaccination, including COVID-19 vaccination. According to the CDC, vaccine monitoring has historically shown that adverse effects generally occur within 6 weeks of receiving a vaccine dose.² The FDA required each of the available COVID-19 vaccines to be studied for at least 2 months (8 weeks) after the final dose.

Rumored Effects. People may be concerned about any number of rumored side effects of COVID-19 vaccines that have no basis in fact. A common fear is contracting COVID-19 illness from the vaccine. None of the available COVID-19 vaccines (or any of the vaccines in development) contain a live attenuated virus or any other infectious material. People with this fear should be reassured that they cannot and will not get COVID-19 from any of the vaccines.

Some people are concerned that COVID-19 vaccines—especially mRNA vaccines—will alter their DNA. The vaccines do not change or interact with DNA in any way. It is true that mRNA COVID-19 vaccines deliver genetic material to cells to produce copies of the “spike protein” found on the surface of SARS-CoV-2 (the virus that causes COVID-19). However, the genetic material does not enter the cell nucleus, so it cannot affect or interact with a person’s DNA.

Other rumored adverse effects of COVID-19 vaccines include cancer, birth defects, and infertility. There is no evidence to suggest that any of these effects are due to COVID-19 vaccination.

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References

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