

10 Common Questions About the Covid-19 Vaccines

By Bill Lieber, MD

As we turn the page into a new year, we are all happy to see an end to 2020. It has been a year unlike any other we have ever experienced. The announcement of several vaccines effective against Covid-19, along with their rollout in December, helped usher in 2021 with the hope that life can, and will, eventually return to normal. While the vaccine hopefully does signify the beginning of the end of Covid-19, the days of wearing masks, social distancing and quarantining are certainly not behind us yet. In this article, I aim to address some of the common questions I have been asked regarding the vaccine.

1. How does the vaccine work? I've heard it can alter my DNA. Is that true?

The currently available vaccines use RNA to make the spike protein that is found on the outside of the Covid-19 virus. RNA is ribonucleic acid. It carries the instructions for the synthesis of proteins. When the vaccine RNA is injected into our bodies, it bumps into ribosomes in our cells. Those ribosomes then "read" the RNA and build the Covid-19 spike protein. Our body recognizes this protein as a foreign substance (an antigen) and generates an immune response to it. As part of that immune response, our bodies make "memory cells" whose job it is to produce antibodies against the spike protein, should we be exposed to it again after vaccination-- for example, should someone with Covid-19 cough on us at the grocery store. As you can see, the RNA definitely does NOT alter your DNA. It is a clever way of using our own bodies to produce the antigen that we want to fight.

2. Are these vaccines safe? Were important safety steps skipped in developing and testing these vaccines?

While the technology used to create the Covid-19 vaccines is new, the medical community has been developing and administering vaccines for hundreds of years. The first vaccine was developed in 1798 and used to treat/prevent smallpox. What we have learned over the last 220 plus years of vaccinations has allowed us to safely accelerate the process. Our understanding of infection and immunology has grown tremendously and put us in a position to rapidly develop these vaccines. The vaccines that have been authorized for emergency use by the FDA have gone through the same trial process as previous vaccines. The process was given expedited review by the FDA and therefore allowed to proceed more quickly from phase 1 to phase 2 and then to phase 3. None of the steps were skipped. We found that the risk of a serious adverse event in people who receive the vaccine is not significantly higher than those who receive a placebo shot.

3. Once I get the vaccine, how long until I am protected from Covid-19? Does just one dose of the vaccine give me protection?

We think that it takes about 2 weeks after the second dose of vaccine to achieve maximum protection. That protection is not 100% effective. Studies have shown the current vaccines to be about 95% effective. While that is outstanding for a vaccine, it doesn't guarantee that you won't get Covid after being vaccinated. The effectiveness of the vaccines has been shown to be around 89%, starting 15 days after the first dose. Some people, and countries, are suggesting that we should vaccinate everyone with one dose before beginning to distribute and administer any second doses. However, because the studies were done by giving a second dose at either 21 days (Pfizer vaccine) or 28 days (Moderna vaccine), we don't have any information as to whether or not a single dose offers protection beyond the 21 or 28 day period. Therefore, most physicians and scientists feel we should not alter our vaccination process from that of the studies.

4. Once I am vaccinated, do I need to wear a mask? Can I visit my friends and family?
Can I go back to "normal life?"

We know that the vaccine offers 95% protection for those vaccinated. What we unfortunately do not know is whether the vaccine prevents a vaccinated person from spreading Covid. If you are vaccinated and are exposed to Covid-19, your likelihood of having symptoms is very small. However, as your body is fighting off the disease with its shiny new memory cells, thanks to your vaccine, you may still be able to transmit the disease to people who have not been vaccinated. Therefore, it really isn't safe to ignore the preventative measures we currently have in place, such as social distancing, wearing a mask, and avoiding large gatherings. Remember, the main function of a mask is to prevent an infected person from spreading the disease, rather than preventing the person wearing the mask from contracting the disease. So, even after receiving your vaccine, it's important to do your part to keep others safe.

5. Once I am vaccinated, can I safely get together with others that have been vaccinated?

This is the best case scenario for getting back to normal. If everyone in a group has been fully vaccinated, it would be very unlikely for anyone in that group to contract a significant Covid infection. This is basically the way in which herd immunity works-- vaccinate enough people and the disease won't have enough hosts to continue infecting. This would essentially kill off the virus for good.

6. How many people need to be vaccinated to reach herd immunity?

We don't know for sure, but Dr. Fauci has estimated that it is likely between 70 and 90 percent of the population. So, that means that the US would need about 265 million people to be completely immunized to reach herd immunity. We have two currently available vaccines and more on their way to being authorized. The difficulty lies in vaccine distribution. Getting 80% of the people in the country to do something once is a hard task. Getting them to do it twice within a 4 week period is even harder. People certainly are motivated to get back to normal, so I am hopeful that the distribution goes off without a hitch. Some experts think we will have widespread vaccination by spring/summer, while others feel it won't occur until summer/fall.

7. Is the vaccine effective against different strains of Covid-19?

Fortunately, Covid-19 does not mutate rapidly and its mutations thus far have been minor. All indicators are that the vaccine is effective against the new strains of Covid-19 that have been popping up around the world. The spike protein is what the virus uses to gain access to our cells. It is what the vaccine targets. As long as there is not a major mutation in that protein, the vaccine should be effective. Most of us are used to getting a flu shot every year. That is because the influenza virus mutates quickly and we get a new strain every year. These new strains of flu are different enough from the previous year that our bodies' memory cells don't recognize them. We must therefore come up with a new flu vaccine every year. Hopefully this does not become the case for Covid-19.

8. If I already had Covid-19, do I need to get vaccinated? Shouldn't I already be immune?

Natural infection does indeed impart some immunity. The problem is, the degree of immunity can vary widely from individual to individual. Sometimes mild infection doesn't initiate enough of an immune response to produce adequate memory cells. On the other end of the spectrum, severe disease can sometimes exhaust the immune system and cause it to not adequately build lasting immunity. We feel that natural infection provides immunity for at least 90 days. For some people it is likely longer. The medical community believes that vaccine induced immunity is more effective and longer lasting. How long your shot will protect you from Covid is yet to be determined. It is possible you may need a booster every 6 or 12 months. Regardless, the immune response derived from the vaccine is more dependable and less variable than that of natural infection. The studies done in phases 1-3 of the trials did not test the vaccine in people who had already had Covid. However, we have been administering the vaccine to health care workers and there have not been any adverse events reported in workers receiving the vaccine who have already had natural infection. It appears very safe, and recommended, to get the vaccine, even if you have already had Covid.

9. Will vaccination cause me to test positive for Covid in the future?

No. In short, Covid testing tests for active disease. The vaccine does not cause active disease. Therefore, it will not cause a person to test positive. This is true for both the antigen and the PCR tests. The vaccine should cause an "antibody test," to be positive. That is the blood test that is done to look for evidence of prior infection. A positive antibody test is a good thing as it implies immunity.

10. When can I expect to get vaccinated?

Right now, each state determines its vaccine prioritization. Therefore, it can vary widely across the US. In many states, frontline healthcare workers and those in group living situations (i.e. nursing homes, rehab facilities, etc), are the first in line for vaccination. These groups will likely be followed by elderly and those with high risk pre-existing conditions. To determine what

groups your state is prioritizing and how the process will work, you should reference your state's department of health services or its equivalent institution.

I hope that helps answer some of the questions you may have about Covid vaccines. I am hopeful we can have some return to normal by the end of 2021, but, until then, we will all have to deal with fogged up glasses and trips back to the car for the inevitably forgotten mask.