

**Why You Should Consider Receiving the COVID-19 Vaccine**  
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The COVID-19 pandemic has been one of the most challenging times of most of our lives. As of March 29, 2021, there have been over 550,000 deaths in the US due to COVID-19 and 30.4 million cases. There have been countless businesses shut down and lost forever. Jobs have been lost and families are suffering financially. Collective lifetimes of school have been lost for children. Stress, anxiety, and depression cases are skyrocketing, with the number of cases of depression tripling compared to prior to COVID-19<sup>1</sup>.

This has been a bleak and trying time for many of us, but a positive note is here. There is a way out of this, which is through vaccination. The purpose of this article is to walk my patients through how I think about COVID-19 vaccines.

**1. It is right and normal to be skeptical about the COVID-19 vaccines.**

I want to point out that it is normal to be skeptical about something new such as a new vaccine. So much has changed in terms of what we know about the coronavirus (SARS-CoV-2) and the disease that causes (COVID-19) throughout the last year. That is partially why public messaging such as whether to wear a mask, whether to wipe down your groceries, whether children should go to school, etc. has changed over time. However, as we learn more about the virus over time it is normal and good to change your thoughts and opinions. For example, it was previously thought that coronavirus was spread via larger respiratory droplets and it was recommended to wipe off boxes, packages, etc. But then it was found by the CDC there was no evidence of spread in this way, so it was no longer recommended to clean the outside of a package you just bought. It is reasonable and normal to change your opinion and practices over time. Similarly, it is an understandable reaction to be hesitant about a vaccine when so much messaging from the CDC, federal government, state governments, and health departments has varied and changed.

**2. Determine your source of information giving you advice about COVID-19.**

Knowing that information regarding COVID-19 is changing quickly, it is extremely important to know your source of information. One should look at the source's reputability, expertise, and if any bias exists. This can be understood by the example of having a leaking pipe going to your water heater and needing advice on how to fix it. If you really want good advice are you going to trust a plumber? Or your next-door neighbor who fixed a water heater once? Or your father-in-law who may have no clue what they are doing? Or are you going to YouTube it and hope it goes well? It is highly predictable the most likely outcome you will get in each scenario. If you use a good plumber's advice, the leak will likely be fixed and not bother you again. If you have never seen a copper pipe before and are trying to YouTube it, it will probably end with you calling a plumber anyway.

Your source in this case is myself, Tom Frandsen, a family physician. I am not paid by any drug companies, have never taken a dime from a company to order any particular test, prescribe a drug, or give a vaccine. I have no financial disclosures besides billing your insurance for medical visits. I have had experience personally testing and treating well over 100 of my own patients for COVID-19 at this point. I have seen the effects of the disease firsthand daily. I have also continued to provide normal wellness checks, seen patients for ongoing chronic problems, not

to mention continued to see them in the office in a safe manner, and helped hundreds with new mental health problems in the last year. I am not a perfect source and bearer of all COVID-19 knowledge, but I do know a thing or two about this topic and am relatable and trustworthy. If you are trusting your friend who knows someone who had COVID-19 so they think that person is an expert, or you “researched it” by googling, that is not doing you any favors. A person should be informed. Just because I looked up on YouTube how to fix a water heater does not make me a plumber.

### **3. Vaccination is the only way humans have ever wiped out an infectious disease.**

This is an important reminder to all of us. COVID-19 has turned most of our lives upside down. The key to getting out of the COVID-19 disaster is through decreasing the amount of disease to a minimal amount or zero. Masking, social distancing, and handwashing will not do that alone. Does everyone remember about “bending or flattening the curve”? It was never intended or thought these measures would completely wipe out COVID-19.

To stop such an infectious disease, there has to be a certain amount of the population reaching immunity in order for COVID-19 to stop replicating in the community. This can either be reached by a vast quantity of the population actually getting the disease, which would lead to unthinkable mortality levels, or through vaccination.

Vaccination has saved the population from many terrible diseases. Do you remember polio? If you do not, ask your parents or grandparents. That was a horrible disease that left children paralyzed, in iron lungs, and millions dead. This has almost been completely eradicated through ongoing vaccination. Does anyone remember a person having small pox? It was eradicated from the US in 1972, and the last naturally acquired case in the world was 1977<sup>2</sup>. It was eradicated through a massive global initiative of vaccinations, with vaccination rates of 80% of people in affected countries. COVID-19 may be different and complete eradication might not be obtainable due to variants. It may remain in low levels in the community, however the only way to effectively decrease the viral spread to that level will be through vaccination. Vaccination is the key to success.

### **4. COVID-19 vaccines have been rigorously studied.**

Knowing that vaccination is the key to success, we must understand how vaccines are created and studied to feel comfortable with receiving one. Typically, vaccines are studied first in animal studies and then humans. Vaccines are studied in three phases of human trials, called phase 1, phase 2, and phase 3. Phase 1 is done typically in 20-100 participants and looks to answer if the vaccine is safe and to demonstrate that an immune response occurred showing the vaccine worked. Phase 2 is typically several hundred to one thousand patients and studies if there are major adverse effects seen and again, how are the participant’s immune system responding to a vaccine. Phase 3 is a large trial of thousands of participants that expands on the question of safety and effectiveness of the vaccine.

There are two similar types of COVID-19 vaccine made by two different companies, being Pfizer and Moderna. The Pfizer vaccine was studied in the usual fashion, culminating in a phase 3 randomized, double blinded, placebo-controlled trial in approximately 44,000 participants of a wide variety of ages, both sexes, ethnicities, and medical problems<sup>3,4</sup>. Moderna was studied in similar fashion in approximately 30,400 patients<sup>5,6</sup>. This is the gold standard type of study in making a vaccine. This means that a wide variety of people are divided into two groups, with

approximately half randomly selected to receive a placebo (saline) and half receive the real vaccine. Double blinded means that neither the vaccine recipient nor the people doing the study know if the placebo or real vaccine is being injected into the recipient. This is important because it prevents bias in the study. It is also important because you can see what the effects of a placebo on a patient are and truly determine how often adverse effects occur. After the study is complete, the results are assessed by an independent panel who knows which participants received actual vaccine and who received placebo, so the data can be analyzed.

These two vaccines have a two-dose schedule. The Pfizer vaccine has the second dose three weeks after the first and Moderna's is four weeks after the first dose. The two-dose schedules were used because this showed the best potential for a strong immune response against the virus in phase 1 trials.

The phase 3 studies were completed over several months which allowed for follow-up of a median of approximately 2 months after the second dose of vaccine. This is important because generally when administering vaccines, the biggest adverse events will happen within that timeframe. This is the same type of study that has been completed for countless other vaccines and medications. This means we can feel good that any major safety problems will be identified in those studies.

Johnson & Johnson (Janssen) was the third vaccine released in the US. It is a one dose vaccine and has undergone the same rigorous testing. This vaccine was tested in the US, Latin America, and South Africa, notably in the time of multiple variants found. It was tested in approximately 40,000 participants<sup>8</sup>.

**5. The available COVID-19 vaccines are highly effective. The COVID-19 vaccine will prevent hospitalization and death.**

All available vaccines have been thoroughly studied as discussed above. Pfizer and Moderna are extremely effective at preventing COVID-19, being 94-95% effective at preventing illness. Johnson and Johnson was approximately 66-67% effective at preventing illness, however is very similar to Pfizer and Moderna in preventing hospitalization and death. In the Moderna and Pfizer studies, no patient who received a COVID-19 vaccine was hospitalized for COVID-19. The only people hospitalized were those who received the placebo. The Johnson & Johnson vaccine was 100% effective as well at preventing hospitalization four weeks after vaccine administration. No patient who received a Johnson and Johnson COVID-19 vaccine died.

I can tell you my own experience as well. In February 2021, one of my children got COVID-19, likely from school, which led to the other two children getting COVID-19. My wife and I were fully vaccinated by then thankfully and neither of us ended up getting COVID-19. If we could live in our house with three children ages 5, 7, and 10 crawling all over us and not get COVID-19, that's a testament to the vaccines.

**6. The available COVID-19 vaccines are safe.**

Both the Pfizer and Moderna vaccines have similar side effects of most vaccines. The most common solicited adverse reactions from the vaccines are (Pfizer/Moderna): injection site reactions such as redness or pain (84.1%/91.6%), fatigue (62.9%/68.5%), headache (55.1%/63.0%), muscle pain (38.2%/59.6%), chills (31.9%/43.4%), joint pain (23.6%/44.8%), and fever (14.2%/14.8%). Severe such symptoms were unlikely with the highest risk of 4.6-9.7%

after the second doses. In both vaccines, the frequency of serious side effects were the same in the vaccine group versus the placebo group. Hypersensitivity (allergic) reactions did happen but none that were serious enough to cause hospitalization. Anaphylaxis, meaning a severe allergic reaction making you feel short of breath, etc, is rare but certainly possible. It is now known through adverse event reporting that the chance of anaphylaxis after a COVID-19 vaccines occurs in 2-5 people per million vaccinated<sup>9</sup>.

For Johnson and Johnson, the most common reactions were injection site pain (48.6%), redness (7.3%), swelling (5.3%), headache (38.9%), Fatigue (38.2%), muscle aches (33.2%), nausea (14.2%), and fever (9.0%).

My practical advice is that if you get a COVID-19 vaccine, it is certainly possible to get pain in your arm, fatigue, headache, muscle pain, possibly fevers, but that is better than getting COVID-19 and/or giving COVID-19 to a family member who could be hospitalized or die.

**7. There are side effects of any vaccine, but this is often a sign that your immune system is working.**

As above, there are side effects of the COVID-19 vaccines. Moreover, there seem to be slightly more with the second dose. My own experience with the vaccine is common. I received the Pfizer vaccine, and had no side effects after the first dose, but with the second dose I had mild side effects of muscle aches, headache, and fatigue. I tried to tough it out but was at work trying to concentrate, so I took a dose of ibuprofen and my symptoms all resolved. This is the only time I remember taking ibuprofen after a vaccine. I see having these symptoms as a good thing because it shows my immune system was responding to the exposure of the spike protein produced by the vaccine. These are the same symptoms as when patients complain that they “get the flu” with the flu shot. People do not actually get influenza as it is impossible to get influenza from a flu shot. What is happening is your body is producing cytokines and your immune system is kicking into gear, which can cause an array of symptoms like fever, body aches, muscle aches, etc. If you can tolerate the symptoms without acetaminophen or ibuprofen, then that is best but worst-case scenario they often resolve with such medications. If patients can reframe mild side effects of a vaccine as a good thing, realizing their immune system is working as it should, side effects can be much more tolerable.

**8. The COVID-19 vaccines have not been rushed.**

As stated above, COVID-19 vaccines have been studied in the typical fashion of any vaccine and thoroughly studied. The studies were able to be completed so quickly because the federal government removed the financial constraints for companies who make vaccines. Normally it takes years of studying and billions of dollars to make a vaccine because a company is investing their own money in creating that vaccine. If a company is creating a vaccine and during the studies a patient has a side effect or serious event then the company may stop and really look at if they want to continue the study because not only is it potentially causing harm to patients, but they may be investing a lot of money into something that will never be administered to patients and they stand to lose millions or billions of dollars. In operation warp speed and through the COVID-19 legislation approved by Congress in 2020, the goal was for vaccine manufacturers to create an effective and safe COVID-19 vaccine as quickly as possible. This could only be done by taking out the financial constraints. The federal government facilitated this by either giving money to companies to make vaccines, or vaccines were guaranteed to be reimbursed afterwards. Thus, billions of dollars of federal money was essentially subsidized to

these companies to allow this process to be done quickly. The process was not rushed. It was facilitated by removing financial barriers and red tape.

**9. Fully vaccinated people can visit other fully vaccinated people indoors without masks**

The CDC currently acknowledges and recommends that fully vaccinated people can visit with other fully vaccinated people indoors without wearing masks or physical distancing<sup>10</sup>. Fully vaccinated people can also visit with unvaccinated people from a single household who are at low risk for severe COVID-19 indoors without wearing masks or physical distancing. There is growing evidence that COVID-19 vaccination prevents asymptomatic spread and that is part of the reason for the change in recommendations.

**10. Fully vaccinated people do not need to quarantine or test following a COVID-19 exposure if they continue to remain asymptomatic**

Again, vaccines prevent symptomatic and asymptomatic COVID-19, so it is now recommended that if you are exposed to COVID-19 you do not have to quarantine. This means no potential days locked in your house, lost wages, or lost school time. Remember that starting January 1<sup>st</sup>, 2021 employers are no longer required to pay employees for quarantine or if you get COVID-19. Also remember that quarantine is at least 10 days if you are exposed, and if you get COVID-19 during your quarantine, you need to isolate for another 10 days after your symptoms start. You can easily miss a half month of wages if a friend or family member is sick with COVID-19 leading to your quarantine and then actually getting COVID-19. Thus, there is a great monetary benefit to vaccination.

**11. The COVID-19 vaccination will not alter your DNA, make you infertile, implant a microchip, or give you COVID-19. It was not made with fetal tissue.**

There are many myths about COVID-19 vaccines that are simply false. There are many people who are conspiracy theorists who spread lies about something to create fear and uncertainty. The truth is the Pfizer and Moderna COVID-19 vaccines are made of a lipid nanoparticle (fat lined sphere) with mRNA which is a genetic make up of the spike protein on the outside of the SARS-CoV2 virus. The mRNA enters our cells, which causes our body's own cell machinery to make the spike protein (not active virus), to which the body can then produce an immune response including antibodies, cytokines, among others. It will not integrate with human DNA. The mRNA is synthetically created in a lab and is not the SARS-CoV-2 virus. The vaccine contains no virus, so you cannot get COVID-19 from the vaccine. This technology has been around for over a decade and advances have occurred leading to the development of an effective, safe vaccine that can be quickly mass-produced. These vaccines do not have fetal tissue. Additionally, it is simply not like the placental protein syncitin-1 and will not make you infertile. In fact in the Pfizer study, 23 women became pregnant during the trial and the only one who had a pregnancy loss received the placebo. The vaccines do not have microchips or magnets. Do not believe everything on social media.

Another common misconception I have heard is that people are dying from COVID-19 vaccines. The common story is someone saw on Facebook that a friend's family member knows someone who died two days after getting a COVID-19 vaccine. The rumor spread is that the vaccine must have caused their death. However, this is an example that correlation does not equal causation. Just because someone obtained a COVID-19 vaccine in the days prior to death does not mean it caused their death. This is no different than saying a person who ate their first apple two days before they died must have been killed by the apple. That doesn't sound very logically, does it?

Of course, if someone dies after a COVID-19 vaccine, it should be reported and investigated. However, as of March 22, 2021, the FDA has found no detectable patterns in cause of death that would indicate a safety problem with COVID-19 vaccines, meaning no patient has died of the COVID-19 vaccine. Remember as of March 2021, there are still 1,000 – 2,000 people dying daily from COVID-19 in the US alone.

**12. Your COVID-19 vaccine will prevent your mom, dad, grandmother, grandfather, older coworkers, and neighbors from being hospitalized and dying.**

COVID-19 is now a preventable problem. Society is not helpless. Vaccines have enabled this fact. If you have complained at all about the way COVID-19 has disrupted your life, you should consider getting the COVID-19 vaccine. I would argue the most selfless thing you can do in these times is get vaccinated against COVID-19. A vaccine will protect yourself, as well as your family, friends, and coworkers who may be vulnerable to severe disease. It will also protect our children as they are not eligible to receive a vaccine if under 16 years old. We all should consider getting vaccinated to help others in the world. If my grandfather enlisted in World War II to fight a cause greater than himself and risk his life on a minesweeper in the Pacific Ocean, I am pretty sure all of us can step up and get a shot in the arm. It is not hard and it is not that bad getting a shot. The chance of something really bad happening from the vaccine is extremely unlikely (e.g. anaphylaxis risk is about 2-5 in a million). The chance of you really benefitting from it or helping someone else is extremely high. I believe it is one of the most caring and thoughtful things you can do for your neighbor this year. We should all consider getting a COVID-19 vaccine a priority.

**Citations:**

1. Prevalence of Depression Symptoms in US Adults Before and During the COVID-19 Pandemic. Ettman, C.K., Abdall, S.M., Cohen, G.H. JAMA Network Open. 2020 Sept 2. 10.1001/jamanetworkopen.2020.19686
2. Vaccinia (smallpox) vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2001. Rotz LD, Dotson DA, Damon IK, Becher JA, Advisory Committee on Immunization Practices. MMWR Recomm Rep. 2001 Jun 22; 50(RR-10):1-25; quiz CE1-7.
3. Vaccines and Related Biological Products Advisory Committee Meeting. Pfizer and BioNTech. 2020 Dec 10. <https://www.fda.gov/media/144245/download>
4. Safety and Efficacy of the BNT162b2 mRNA Covid-19 Vaccine. Polack, F.P., et al. New England Journal of Medicine 2020; 383: 2603-15. 10.1056/NEJMoa2034577
5. Vaccines and Related Biological Products Advisory Committee Meeting. ModernaTx. 2020 Dec 17. <https://www.fda.gov/media/144434/download>.
6. Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine. Baden, L.R., et al. New England Journal of Medicine 2021; 384:403-16. DOI: 10.1056/NEJMoa2035389
7. Allergic Reactions Including Anaphylaxis After Receipt of the First Dose of Pfizer-BioNTech COVID-19 Vaccine- United States, December 14-23, 2020. MMWR Morb Mortal Wkly Rep 2021;70:46-51. DOI: <http://dx.doi.org/10.11585/mmwrmm7002e1external.icon>.
8. Vaccines and Related Biological Products Advisory Committee Meeting. Janssen Ad26.CO2.S Vaccine for the Prevention of COVID-19. February 26, 2021. <https://www.fda.gov/media/146217/download>.
9. Selected Adverse Events Reported after COVID-19 Vaccination. Centers for Disease Control and Prevention. Updated March 22, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/adverse-events.html>
10. Interim Public Health Recommendations for Fully Vaccinated People. Centers for Disease Control and Prevention. Updated March 8, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html>