COVID Vaccine Q&A
8/27/21

If I get vaccinated, will it prevent me from spreading the Delta variant and the regular COVID 19? With the original COVID-19 virus as well as the initial variants, it was extremely unlikely to spread COVID-19 if you had been vaccinated. This was because the viral load (number of viral copies inside a person able to be spread by talking, laughing, coughing, etc) tended to be very low in vaccinated individuals. The delta variant has changed the game somewhat as it is much more contagious (easier to spread with faster incubation periods meaning you become symptomatic sooner and can spread to others quicker). It is also much more infectious (viral loads 1000x higher than previous versions of COVID). When facing this beefed up variant, we are now finding viral loads that can sometimes be similar in the vaccinated and unvaccinated populations after developing a COVID-19 infection. This is why the CDC has changed back to asking both vaccinated and unvaccinated individuals to wear masks indoors at all times.

A couple notes on this. First, the viral load in vaccinated individuals tends to drop quickly a few days into the infection and then stay low which is likely related to vaccinated immunity starting to ramp up protection with a little time. Second, very recent data shows vaccinated individuals are still 3 times less likely overall to become infected with the delta variant of COVID-19 compared to the unvaccinated. This very much decreases your risk to others.

I know the mask guidance changes are annoying. It's also annoying to hear that vaccinated individuals can spread COVID more than in the past. This is the frustrating part about dealing with a virus like this. When it mutates, we have to accept the hand we are dealt and keep on pushing. Thankfully the virus has not escaped the vaccine at this point, and the vaccine is still very strongly preventing severe disease, hospitalization, and death.

If I am still testing positive for antibodies- will the vaccine make me ill? I had no symptoms last year when I had COVID. It is tough to say exactly whether the presence of antibodies itself increases your risk of symptoms after receiving the vaccine. This is because there are very inconsistent standards with interpretation of antibody tests (what level is significant? We don't know) as well as other forms of immunity to COVID being present in the body besides the antibodies searched for in those lab tests. The human immune system is very complex and difficult to monitor with one specific test.

Here is what we have been seeing routinely with COVID vaccinations and how I counsel about side effects:

- In individuals that have never had a Covid infection, they typically have no symptoms after the first dose. They may have a sore arm but that is usually about it. After the second dose, there tends to be a 24-36-hour period consisting of temporary side effects such as body aches, chills, headache, fatigue, and even some fevers. These side effects are directly related to the body's immune response to the spike proteins from the vaccine that are being recognized by the body as foreign.

Why only after the second shot and not the first? This is because these individuals have no antibodies to COVID when the first shot is administered due to never having had COVID. The first shot allows for antibodies to start being produced over the next few weeks. When it is time for the second dose, the recently created antibodies are able to pounce on the spike proteins in hopes of removing this foreign threat from the body. This activates the immune system leading to typical flu-like symptoms. However, they do not last long because there is no actual virus present that is able to multiply and keep you feeling sick. The mRNA from the vaccine is only

around for 2-3 hours before it breaks down. The spike proteins are probably only around for a couple weeks at most.

- In individuals that have had a Covid infection in the past, they typically have antibodies in their system at some level. This is why they often have those flu-like side effects after the first dose. The symptoms tend to be very similar to the side effects from the second dose in those without history of COVID infection. Side effects still typically last between 1-2 days. They still respond very well to Tylenol and ibuprofen. They have not seemed to be worse in patients who had COVID in the past. Some patients have similar side effects after the second dose as well, although not all do.

There is a general rule that younger immune systems tend to have a more powerful immune response compared to older immune systems. Because of this, I often counsel younger individuals to be ready to feel like you are getting the flu for a day or two. It still is very transient and almost never causes more issues than minor annoyances. I took Tylenol and ibuprofen three times after my second dose and felt 95% better afterward. I was able to see patients the entire day after without issues. For the significant protection against getting, spreading, and dying from COVID, I will take body aches and chills any day of the week.

I had COVID in the past, why do I need a vaccine? I should have natural immunity. Unfortunately, natural immunity is not always as amazing as we would hope. There are multiple technical reasons that vaccinated immunity is typically stronger and longer lasting than natural immunity. The immune system is messier when dealing with a natural infection, and not all the targets it produces antibodies to are helpful. When giving the mRNA vaccine that creates a couple million spike proteins, the immune system does an excellent job creating a focused response that is likely to give longer lasting protection as well as offering more protection against mutations as long as the spike protein remains intact. And if that changes, we will know very quickly and a booster with the new spike protein would be utilized.

***The most recent data I have seen pertaining to natural immunity and the Delta variant show that natural immunity is only offering a 25-30% effectiveness against the Delta variant. You are much more likely to be reinfected with COVID after a natural infection if you are not vaccinated.

What am I gaining if I get the vaccine? Great question. The most significant thing you are gaining is extremely successful protection against severe disease, hospitalization, need for intubation/ventilation with a machine, and death. As of this this week, the 6 largest ICUs in Kansas are completely full. Late last week, Wesley Medical Center let us know that their ICU was full due to Covid. They had 90 Covid patients in their hospital with 20 on ventilators. 95% were unvaccinated. Majority were under 50 years of age.

The vaccine is continuing to show very strong protection in keeping patients out of the hospital. This obviously is good for the individual patients at risk for COVID, but it also allows the healthcare system to function efficiently and not be overwhelmed. When ICUs are full, the next heart attack or stroke or car accident has no bed. You may not feel you are at high risk for COVID, but you can directly be affected by how strained hospitals are at this point if you have any medical emergency. It has been extremely difficult for us to transfer non-COVID patients anywhere within the state over the last 3-4 weeks. Basically, now is not the time to have a medical emergency. If you were planning one, please reschedule.

Another benefit is the decreased risk of developing COVID infections and less risk of spreading it. As stated above, vaccinated individuals have a 3x less risk of developing COVID per the most

recent data, as well as viral loads that do admittedly start high but then sink making you less infectious for a good portion of your infection if you do get COVID. Your viral loads will stay much higher if you are not vaccinated allowing you to spread COVID much more easily.

As we are all healthcare workers, we work with many people that have compromised immune systems. They don't need COVID. Even our healthy people don't need COVID. And they especially don't need COVID from the people that literally come to work every day to make sure their patients' lives are better, safer, and healthier. Vaccines are the most effective public health measure for slowing the spread of the virus and keeping us all as healthy as possible.

What about breakthrough infections in vaccinated individuals? I keep seeing stories in the news.
Breakthrough infections will happen on occasion, although they are typically mild and short-lived. The amount of breakthrough infections is being monitored closely by the CDC to determine when boosters will be needed. The most recent data has prompted the CDC to recommend booster doses 8 months after your second dose in order to help prevent these mild breakthrough cases. The good news is that to this point, there has been no evidence that protection against severe infection or death is decreasing. This is helping to keep breakthrough hospitalizations and deaths at a very low level.

There will be cases of vaccinated individuals with breakthrough infections that require hospitalization and may even cause death, but a large portion of those are going to be immunocompromised patients. We are finding that those patients do not often make enough immune response to make the protection necessary to keep COVID away. This is why the CDC has recommended boosters for all immunocompromised patients as of 2 weeks ago.

The rest of the breakthrough cases are still going to be a very small minority that for some reason did not mount the response we hope for, or potentially had enough time pass that they needed a booster dose. Hopefully we can learn more about why this happens and help prevent that going forward. If you are a late adopter of the vaccine, this is not really a concern for you.

We still have 1 resident that is never going to get the vaccine. Will we always have to wear a mask with that resident? Great question that probably doesn't have an answer at this point. If the resident never receives the vaccine and COVID continues to circulate, the answer will likely be yes unless the patient changes their mind. Honestly, it's the least we can do for them. The rest of that answer depends on what happens with COVID in the next few years. Who knows.

What are the long-term effects of the vaccine?
I see a lot of patients concerned about the long-term effects of this vaccine. It is completely understandable to feel that way. The vaccine did seem to come out fast which sounds scary. When you take a fairly unknown topic to the general public like vaccine production/history/side effects, pretty much anything can sound scary. A lot of this comes from a simple lack of knowledge. If one feels the vaccine was rushed, do they actually know how long it takes to produce a vaccine? Do they understand the advances in science over the last 30 years that allow vaccines, especially mRNA vaccines, to be created much faster? Do they understand that the clinical trials were run concurrently rather than one stage at a time which did not compromise safety but cut through a lot of the bureaucratic red tape that tends to bog down vaccine testing? When pointing out these things to concerned patients, they start to understand their fears are not necessarily ones with legitimate scientific concerns. The vaccine situation becomes a lot less scary. I have a separate handout on this if this is a major concern.

What most people don't know is in the history of modern vaccines, no side effects have occurred more than 2 months out from vaccination. The majority of vaccine-related side effects occur within the first 4-6 weeks. When vaccines are very early in testing, it can sometimes be tricky to pick up on rare side effects. However, the hundreds of millions of doses already administered have been able to appropriately pick up on concerning side effects. This is evidenced by the findings of rare blood clots in women under 50 with the Johnson & Johnson vaccine, as well as cases of myocarditis that have been seen in the under 30 typically male population (see below for more).

Long-term side effects are not historically realistic concerns for vaccines. I understand there are people on social media railing against the vaccine assuming there must be some sort of long-term side effect. If anything is going to occur beyond 2 months for vaccination, it would likely be one of the extremely rare side effects that would only be picked up then 1 per 100 million doses, etc. that was not able to be found until a larger majority of individuals were vaccinated. With the risk of Covid to individuals being thousands and thousands of times higher than those rare vaccine side effects, I have absolutely no concern recommending this vaccine for the general population.

I am of childbearing age. I have no children yet, but want them in the future. Should I be worried about this vaccine?

Let's talk about infertility concerns. Early in the pandemic when the vaccines were just starting to be released, I saw a story on social media that an ex-Pfizer executive made a public statement that the Covid vaccine would make you infertile if you received it. His reasoning was that the spike protein being made from the mRNA vaccine is a very similar protein to one found on the human placenta. Based on this, creating antibodies to the spike protein would confuse the immune system and cause it to attack any future placenta within your body. As placentas are vital to having children, this would cause infertility.

There are a few problems with this theory. First, if antibodies to the spike protein from the mRNA vaccine could cause infertility, everyone that naturally had a Covid infection would infertile. This is because the spike protein was taken directly from the Covid virus. When you get Covid, you make antibodies to the same spike protein and thus would be at the same risk via the same mechanism for infertility. This is simply not happening.

Second, the human body is much more sophisticated than that. While the spike protein is in a similar class of proteins as the human placental proteins being discussed, they are not even close to being identical. This was simply a smart sounding but completely inaccurate theory that scared a lot of people.

Third, the Pfizer executive who made this claim had nothing to do with vaccine production. It seems he had a personal vendetta against the company rather than having the general public's wellbeing in mind. Not cool, especially as his comments have instilled fear in the hearts of so many younger Americans.

Fourth, there is no evidence to support infertility occurring in the post-vaccinated or post-Covid groups. There will be anecdotal stories among your friends or loved ones of miscarriage that occurs after vaccination. However, this is an unfortunate truth of life. Miscarriage rates can be up to 25% in the average population. That does not stop just because a vaccine unrelated to fertility is given to the general population. So when miscarriages continue to occur, it can wrongfully be attributed to the vaccine.

The way scientists determine whether something is actually a cause of something else is by comparing a group like vaccinated individuals to either an unvaccinated group or to the general population. Here is where science offers us fertility reassurance. There was a very recent trial published based on the V-safe vaccine reporting data that has been collected post-vaccination since December 2020. Many of the vaccinated individuals in our area (myself included) were periodically asked questions about side effects or issues in the post-vaccine period to compile this data.

One of the questions tracked was about pregnancy after the vaccine. Looking at all the reported pregnancies and outcomes of those pregnancies, miscarriage rates were no different than the general population. There were no differences in pregnancy outcomes. No early labor. Nothing. There is absolutely no evidence that infertility will occur after this vaccine. I cannot say it enough. All leading professional groups that have anything to do with pregnancy and women's health are recommending vaccination for women of all ages, as well as recommending vaccination during pregnancy. I know this is scary to many and fertility is one of the most valuable things you could ever be given, but there is absolutely no data to support that your fertility will be affected in any way.

If you are pregnant, can the vaccine affect the pregnancy? Complications or birth defects?
See the fertility response above for a more complete answer about pregnancy. There have been no findings that the vaccine is causing any pregnancy complications or birth defects. What has been shown is that pregnant women are 5 times more likely to develop a severe case of COVID (these numbers were pre-Delta, so may actually be higher now). Pregnant women are more likely to go to the ICU, need ventilators, have preeclampsia, die from COVID, have preterm or stillborn births, or have their babies admitted to the NICU compared to the general population. There are 42 studies detailing this with more coming.

Pregnancy is a naturally immunocompromising condition that makes women more susceptible to infections. This is why pregnant women are not supposed to eat soft cheeses or sushi or raw steak or deli meats to avoid things like listeria, salmonella, campylobacter, and E coli. COVID and pregnancy don’t mix well. Vaccination can help keep you and your baby as safe as possible.

Another way vaccination can affect pregnancy is by passing antibodies to your baby. When looking at the studies coming out about vaccination in pregnancy as well as in breastfeeding, it appears the biggest advantage is to vaccinate in pregnancy. Likely both are helpful to an extent, but there are some implications that vaccination during pregnancy offers a more useful type of protection as antibodies are passed through the placenta very effectively and do not have to be swallowed/digested. I just read through 7 studies about this protection and am very pumped as my wife is currently pregnant. We have every intention of getting her an 8 month booster during pregnancy in hopes of COVID protection.

I take blood pressure medication- how will the vaccine effect this? If it does affect you, it would be while you are feeling the immune response side effects like chills, body aches, etc. I guess you could potentially have a slight elevation in your blood pressure, but it would be very short-lived. I would just check your BP occasionally if feeling bad. After being involved in hundreds of vaccinations, there have been no BP issues that I can remember. And again, no long term issues to expect.

I have never had COVID- so I am not sure I want this in my body. Read through everything above. The delta variant is much more contagious and is causing more severe sickness, especially in younger individuals. The ICUs are filling up with people under 50. These are the people that feel the safest from COVID and have opted against vaccination. These people do not all have medical problems that put them at risk. It can happen to anyone. It is likely that you will eventually get COVID. Whether it will put you on a ventilator or just give you a little cough and fatigue for a few days is hard to predict. What we know for certain is your overall risk of complications is tiny after vaccination, as well as future risk of severe infection.

What is the difference between the J&J, Pfizer, and Moderna? I see Pfizer and Moderna as almost identical vaccines. They are the mRNA vaccines that have been working exceptionally well. We have the most data on them. They have not had the blood clot issues like the Johnson and Johnson. The overall effectiveness of these two are a bit higher than J&J, although J&J still has been shown to be very effective overall. When choosing between Pfizer and Moderna, I do not see much of a difference. If you want to split hairs, that can be done. However, they are both doing a great job with a very similar side effect profile. Moderna is currently only for 18+, while Pfizer is approved for 12+. Pfizer has officially received full FDA approval as of 8/23/21 for 16+, so that may make some feel safer about choosing that one. Moderna has officially filed and likely will be approved in the September. Pfizer has a three week window between the doses while Moderna has a four week window. We may be seeing a bit longer immunity from Moderna due to the longer window between doses, but it is from very recent data that is still being collected and discussed. If that issue exists, it will be solved by boosters that are currently set to be given 8 months after your second dose anyway.

If I have an illness that affects my immune system, would getting the vaccine affect my immune system? The biggest way an illness affecting your immune system would interact with the vaccination process would be to keep you from forming as strong of an immune response. This is reflected by the stat that 40% of all breakthrough infections in the US (infections in the vaccinated) were in persons that were immunocompromised in some way. If your immune system is not as strong, the vaccine response may not be as strong. You would likely have fewer side effects due to your weakened immune system. Should this vaccine in some way activate an autoimmune pathway and give you some new disease like lupus? No, it should not and has not to this point.

Would we have to get the vaccine seasonally like the flu vaccine? It all depends. This is the million dollar question. If Covid becomes something that the majority of America has either seen before or been vaccinated against, we could see it turning into something less severe and more like the flu or even a common cold. However, with its current ability to mutate into something more severe, it is difficult to know what the future holds. It may be something that requires a few different boosters until fewer cases occur which would allow fewer chances of mutation into something more severe. If I had to guess, I would wager this will be similar to influenza with some years being worse than others. The good news is the mRNA vaccines have been much more effective than the influenza vaccines at this point. We may start seeing mRNA influenza vaccines and have even less chance of getting influenza in the future as well. Yay COVID I guess??

What about the myocarditis concern in kids after vaccination? Should I be concerned about that?
Myocarditis is inflammation and swelling of the heart that can occur for multiple reasons, but most importantly here it can be seen after certain viral infections. What was found within a month of 12-15 year-olds receiving vaccinations was a small risk of myocarditis in teens within days to a couple weeks of receiving the second dose of the Pfizer vaccine. This is basically related to an overzealous immune response in a very small subset of mostly boys between ages 12-17. Most recent numbers are 67 cases per million. This has been scary to a lot of parents of teenagers and rightly so.

The part of the conversation that is helpful to allow proper context is the risk of myocarditis in those same age groups after a Covid infection. This risk is actually 6 times higher (450 cases per million). This is the most recent data that we have (it is a preprint, meaning it was just released and is going through a peer-review process to make it official). These rare vaccine cases of myocarditis are being followed very closely and the majority have made full recoveries in very short periods of time. We are still waiting to hear full results on all cases, but the results so far are very reassuring.

I recently saw a post on Facebook about a child that developed post-vaccine myocarditis, and although they will do fine long term, it was still very scary to the parents and led to someone to post about how we shouldn't vaccinate kids. When analyzing the data appropriately, we could actually post 6 times as many stories about teens who had the same scary myocarditis experience because of Covid. I recently heard a Mayo clinic cardiologist say this in response to myocarditis vaccine risks, "With all the risks of COVID infections, the risk of COVID vaccination is infinitesimally small compared to going without a vaccination."

I have a blood clotting disorder or am concerned about blood clots. Can I take the vaccines?
There have been no reports of increased blood clots or bleeding issues related to either the Pfizer or Moderna vaccines. Many patients have been asked on forms prior to vaccination if they are on blood thinners which may mistakenly give the impression that this is a problem. However, those questions are more for tracking outcomes and ensuring there are no safety issues. To date, no safety issues have occurred so there is no reason to be concerned about this in any population.

The Johnson & Johnson one dose vaccine did have a small increased risk of blood clots mostly in women under the age of 50. The preliminary data that discovered this issue found 8 blood clots in 12 million doses of vaccine given. While these are still excellent odds compared to the risk of COVID infection, we live in a country that has abundant access to the mRNA vaccines that have no clotting issues. For this reason, I would not recommend getting the Johnson & Johnson vaccine if you have any concerns about blood clots.

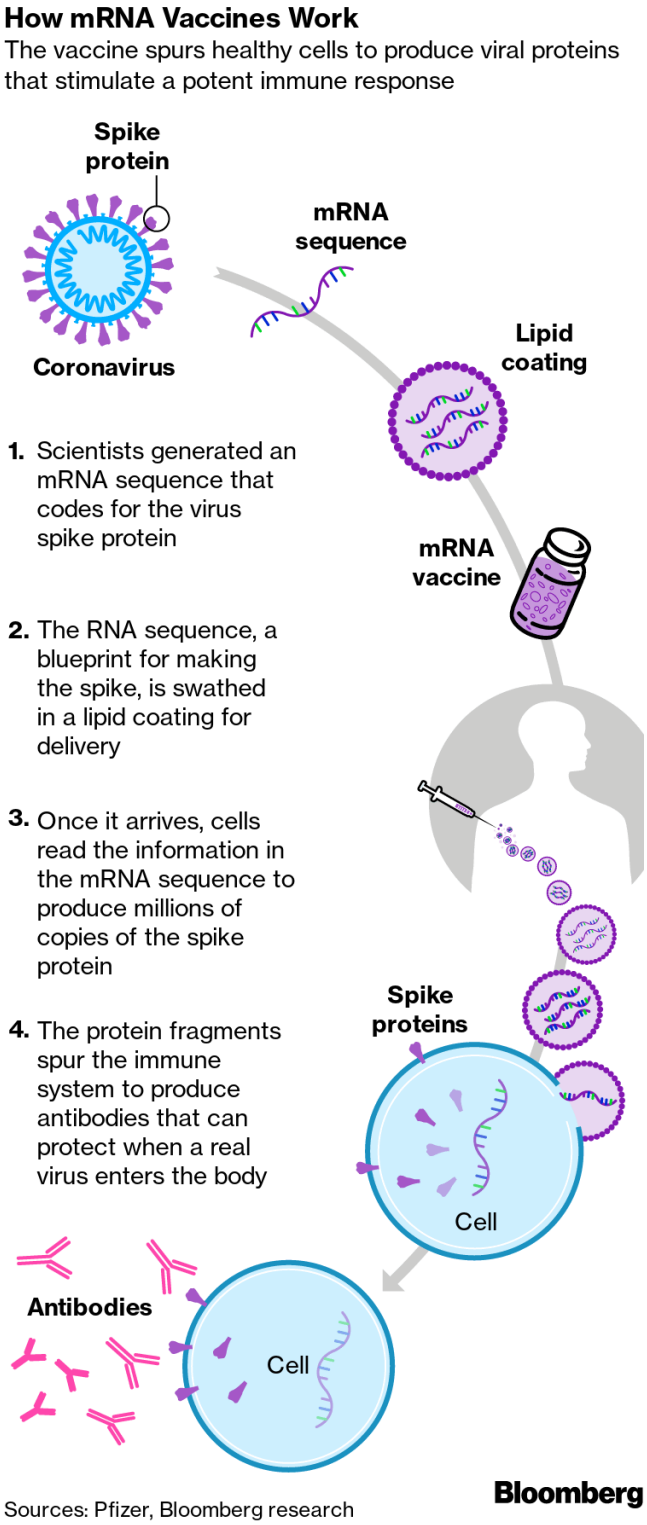
Blood clots have become very commonplace occurrences with COVID infections to the extent that many hospitalized patients have had full dose anticoagulation given to try to prevent them, which can then in turn cause bleeding issues. People can die of COVID infections because of a fatal blood clot being thrown to their lungs. The risk of a blood clot from COVID infection would be higher if you have a clotting disorder or a blood clot history. You are one of the people that would benefit even more from a COVID vaccine than the general population.

I don’t want to be forced to take a vaccine.
Then don’t. Sign up for it willingly. Please. I am begging you. This pandemic is about more than us individually. It is about what we can do together as a country to protect our vulnerable and our strong.

If you feel like you are not at risk, you may be right. You may not, but you may. But I guarantee you are a risk to someone else. There are people out there that are doing everything they can to stay alive in the midst of this pandemic, but they didn’t have the immune system to mount much response to the vaccine. They may not even realize it. Please don’t kill them off. And please don’t kill them off while you are at work! It’s very simple: we are the frontline workers. There are many patients that tell me they only leave their houses for grocery pickups and to go to the doctor. That’s it. And we can give those people COVID.

It is my duty as a healthcare worker (or maybe just as a human in general), to think of others more than myself. I do it for my daughter, my family, my patients, my friends, my church family, the random people at the grocery store, pretty much anyone. There is a very safe option to cut down on the spread and future mutation of this virus. It just might also keep you out of the hospital.

I’m tired of sick people needing ventilators. I’m tired of not being able to transfer those sick people out of this hospital. You may not know or understand what is actually happening in the ICUs. You may believe the media is lying to you and this is all made up. I am not the media. I am not the government. I am not being paid to lie to you. I have seen it so many times with my own eyes. The other providers have seen it. All my friends from medical school and residency are living this nightmare over and over. Our patients are dying from what is at this point a mostly preventable disease. If you plan on trusting the providers here at our facility for any of your other medical issues, please consider the strongest plea I will ever make to you. Get vaccinated. Your life may depend on it.



Plain English:

mRNA injected in your arm helps make the protein that is used to generate the immune response to COVID-19. When your body uses the mRNA to create millions of spike proteins, the body then recognizes the spike proteins as foreign and creates a strong immune response that is ready when you happen to see those same spike proteins again on the actual COVID virus.