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Questions answered by Texas Biomed Vice President for Research Joanne Turner, PhD as shared with the [SA Report](#), in addition to questions that have surfaced recently.

Why should a person get the vaccine?

While getting vaccinated ultimately protect you from contracting the disease, getting vaccinated is also altruistic. It is about protecting our neighbors, friends, relatives and even people we do not know. We have to reduce the burden on the community, and it's important to remember that some of us won't have our loved ones around when we return to normal, so vaccination is the clearest way to see that we keep that number as low as possible.

Are these vaccines safe?

Yes. I believe people should take one as soon as they have access. It does not matter which one you are provided: Moderna, Pfizer, AstraZeneca. They are all going to be sufficient and help protect us.

Why should people trust a vaccine that was produced so quickly?

The speed of development was driven by the urgency of the situation, so money was provided to scientists in a quicker manner, and the pharmaceutical industry got involved early-on to provide their expertise. This has been an extraordinary example of what can be done when the pieces of the scientific and healthcare pipeline all come together quickly for a common goal.

These vaccines deliver messenger RNA. mRNA are natural products made by cells in our bodies and they are the code to make proteins, so it's not something that's alien or invented technology. We are actually using our bodies' own natural processes to convert mRNA to protein instead of giving the protein directly in the vaccine.

I think it's important to know that messenger RNA vaccines have been around a long time even though this one is a new vaccine. It's based on really well known and well-researched technology. Going back at least a decade, there have been mRNA vaccines for rabies, flu, cancer, and Zika.

They have all been developed, researched and they all have been in Phase 1 trials, so we know they are safe in humans for many different infections. All we've done with this one, because we know that it works, is replace the protein that is being made for the spike protein in the SARS COVID virus. While the technology is relatively new, it is tried and tested through basic research and clinical trials.

Should we be concerned about other things in the vaccine that could cause harm?

There are no preservatives in this vaccine. It's one of the reasons it has to be stored in -80° storage. What's in there are things that the mRNA are packaged in so it can get into cells and our body can recognize it. Many of the lipids, fats, and cholesterol contained in the vaccine are already natural products that we make in our bodies. The natural and few synthetic materials in the vaccines serve a purpose, which is to coat the messenger RNA so it can be taken into our bodies and taken up by our cells.

Why are people having allergic reactions?

One of these components appears to cause an anaphylactoid response. This is different than an anaphylaxis response, which is an immune response or memory response to something the body has seen before. An anaphylactoid response are cells responding to certain chemicals. Both are essentially allergic reactions, and it appears one of the materials has the potential to cause this allergic response. Lots of people are allergic to lots of things and pretty much everything we contact everyday has the potential to cause an allergy. We just don't know who is allergic to what until we see a response.

I've seen some questions about what if I'm allergic to eggs or what if I'm allergic to penicillin should I still get this vaccine?

I think healthcare workers are aware and are primed and ready to respond to this very quickly if anyone has an allergic reaction, which is treatable. Right now, healthcare professionals are being

very cautious, so they're saying anyone with known allergic reactions to previous vaccines or severe allergies should wait on taking the vaccine.

These are people that have EpiPens so they're allergic to different things and it's dangerous for them to take that risk so they are being very cautious. I suspect they'll do more research and determine exactly what the allergen is, and then they'll be a very small number of people that are excluded from taking the vaccine.

It's normal to stay in a vaccine center for 15 to 30 minutes to see if people have a reaction. People who have allergic tendencies might stay longer.

Do you know yet if this vaccine will be like the flu, where we have to get one every year or more like tetanus, where we get it every 5-10 years?

We don't know the answer to that question at this point. We have to do more research to understand how long the vaccine works. Vaccination against coronaviruses are typically short-lived, so I think we can anticipate right now that it's probably annual. We are going to have to look into individuals who are vaccinated and see how long it lasts. It could be three months, six months, or multiple years.

Essentially, we will need to continue to look for protective antibodies in people who have been vaccinated to determine how long the antibodies are sustained in their blood, which is the only way to determine protection. This is a situation where we learn over time, just like we did historically with tetanus and flu.

New COVID vaccines are being developed, and there may be another vaccine that comes online that has longer-term protection. The key now is to get something out quickly so we can go back to normal while we wait for other vaccine candidates, potentially better vaccines, to come through the pipeline.

Will these vaccines be affordable? Will everyone have access to them?

As a scientist, I can't answer that, but I do believe these will be made low to no cost given the crisis. I would certainly advocate that it be provided for free or very inexpensively.

What about people with immunodeficiency or AIDS; will they be able to get this?

The type of vaccine will determine if someone with immunodeficiency can receive the vaccine. For example, I have family members who are immunodeficient and probably cannot take the

AstraZeneca vaccine, because it is a live-attenuated virus vaccine that could itself make them feel very sick. Live attenuated virus vaccines are generally very safe in the general population.

The mRNA vaccine, on the other hand, is not live and is very safe for people to take. For people with immunodeficiency we might see is that these individuals do not generate a potent enough response, because their immune system has been suppressed or is no longer working. This means, these individuals will have partial protection, which is really why everyone who can get vaccinated should, because you are in essence protecting these individuals who will not see as much protection.

What happens in someone with partial protection?

Someone with partial protection might still have some symptoms, but they probably won't get severely sick. This is also true with the elderly or someone who's over 65 when they get vaccinated. They don't generate as strong a response than someone who is younger, but they generate enough of a response to prevent them from getting severely ill.

Once it is proven safe, do you recommend that children get the vaccine?

Yes. Children were not included in the clinical trials so scientists will need to go back and do those studies. It will have to go through clinical trials, and the FDA will have to review it and determine if it's safe for children. However, it's important that all the adults get vaccinated, and that will help children be protected.

Will it hurt to get vaccinated?

The needle stick in the arm is very quick and does not go deep, but it does cause some minimal discomfort. Our immune system needs to see something it believes is dangerous to respond, even if it's a fake signal, therefore, you have to have a little pain. I often say if it's hurting it means it's working. As for painful side effects, everyone responds differently.

What are the side effects of this vaccine?

What people have seen is generally:

- Pain and swelling at the injection site, possible redness and/or heat
- Joint and muscle pain
- Headache
- Fatigue
- Chills and/or fever

More serious side effects like dizziness, swelling of face or throat, fast heartbeat have been

reported, so you should call a doctor if you experience any of those symptoms. The minor side effects can be helped with ibuprofen, applying a clean, cold washcloth and drinking lots of water.

Now that people have received the second shot, are the side effects worse?

We have heard reports that side effects seem to increase with the second dose, and the CDC reports that people 18-55 tend to have stronger side effects than people over 55, which could be due to a more active immune system. This increase in side effects is because your body is now primed to produce antibodies to fight the virus and produces a lot of antibodies, so it is normal to feel bad for a few days following the vaccine.

What if the side effects of the vaccine are worse and are lethal, wouldn't the person have been better off not getting vaccinated?

It's a valid concern. The risk for very serious side effects of vaccination do exist but are extremely low and can often be linked to a cause. On a population scale the benefits of vaccinating the whole population outweigh the individual risk but if you are the person sick then it obviously doesn't feel right. Being vaccinated in the presence of a healthcare professional would ensure you get rapid treatment, whereas exposure to COVID socially would not.

We already know that most elderly people don't respond as well to the vaccine and, in fact, have lower side effects because they are not generating a huge immune response, so they are not really getting the full dose that we might see when we are younger.

As for the people who have had the infection already. Is it safe for them to get the vaccine?

It will be safe for them. There are a couple of things that can happen.

1. The vaccine will boost the immune response already in place from natural infection therefore, they get a stronger response and are even more protected.
2. They've generated such a good response that they will clear the vaccine really quickly before additional immunity is generated, but they are already protected so this is OK.

As far as them not getting the vaccine due to natural protection. We don't really know if natural infection leads to a really good memory response. I wouldn't take the risk. I would take the vaccine to make sure that you protect yourself.

Does the vaccine give immunity to other coronaviruses?

It may well do that because we see cross-reactive antibodies in animal models. We know from animal studies that you can detect anti-SARS-COV-2 antibodies in animals that have never been exposed to it because it has similar proteins to seasonal cold and flu.

It might be possible that we can take this vaccine and get protected against the next pandemic of another coronavirus or another seasonal flu that's coming out. We won't know if this is the case until we start living our lives again and being exposed to viruses. This year we can't determine that because most of the population is wearing a mask, and flu and likely cold numbers are down for that reason. It's more proof that masks effectively prevent the spread of flu and the common cold. We are benefiting from wearing masks. It's very good to see how things are transmitted.

Will people need to continue to wear masks even after receiving the vaccination?

Initially, yes. There are a lot of reasons for us to continue to wear masks.

1. We don't know who has been vaccinated and who has not. It's better to have everyone still mask up.
2. Just because you've been vaccinated doesn't mean you can't be infected. And, it doesn't mean you can't be a carrier. We don't know if that's a reality or not at this point, therefore, we should wear a mask and protect ourselves just in case that happens.

We have to get the population vaccination up to 80 or 90 percent to feel confident of this herd immunity so that people could take their masks off more carefully and safely.

Can the government mandate that people vaccinate?

I love that question. The government makes you wear a seat belt. They make you not drink and drive. There's a lot of things the government does enforce on the population. We do things every day that we are unaware that those things have been enforced on us. So, they can, in theory, mandate that everyone take the vaccine, but it is not usual for them to mandate a vaccine.

There are a lot of rumors about who is and who is not protected. Can you share why these rumors are dangerous.

When scientists and healthcare providers tell people to wait for more information, it is because we simply don't know yet, and we are trying to study it as fast as possible so we

can provide the most accurate information possible. There is no upside in sending out false information. We live in the same environment and communities as everyone else, and we want everything to get back to normal just as much as everyone else.

People that have been putting these rumors out on the internet are really driving scientist to have to go and prove it, and prove it again and again. As an example, we spent so much money disproving multiple times the concept that vaccines cause autism. I hate to see that happen again. That money can be used for developing something so much better for human health.

It's also important to understand what it takes to get to some of these questions answers. We often have to do some animal studies to really get at certain questions, such as whether pregnant women are more susceptible or early studies to see if the vaccine is safe before going into human trials. You can't do that type of study on humans so you have to work with rodents or non-human primates. People have to be comfortable with the fact that research on animals is going to have to be done to validate many statements.

Will there be a microchip in the vaccine that the government is going to use to track me?

The government can track you on your cell phone so much easier. Also, I've seen the size of microchips that have gone in my pets. That's a really big needle to make that happen. People would notice if that was happening. You can't fit a chip in a vaccine needle. Also, it wouldn't be very stable. This would be an electronic device that's been frozen at -80 for an extended period of time. I think there are so many reasons why it's incredibly unlikely that they are chipping individuals.

Can I get the flu vaccine and the COVID vaccine?

Yes. The vaccines are different, using different technologies. The flu vaccine does not interfere or interact with the COVID vaccine and vice versa. Both target different mechanisms of infection.

How long should clinical trial lasts?

Most vaccine clinical trials last 2-4 years, and I understand these vaccines will continue to be tested in clinical trials to help us answer some of these longer-term questions, such as how long the vaccine lasts.

Why is there so much focus on a vaccine and not therapies?

Therapies are being studied and developed and enhanced to improve recovery from infection, but ultimately a vaccine ensures people don't get infected and spread infection to others.

The vaccine is the fastest tool we have to getting the country back to normal. If we can stop the infection rate, then our healthcare systems can return to treating the things that still need treating, and they will not be overrun with COVID-19 cases.

What happens if you only get one of the vaccine doses, instead of two?

If you take one dose, then you will generate partial immunity but it may not last very long or it may not be strong enough to control infection. The first does it to 'prime' your immune system so it gears up to make a response. The second dose is to 'boost' it to be a very effective and potent response.

What about minorities? Does the vaccine have the same efficacy rate with minorities?

I'm not aware of any data that suggests that minorities react to the vaccine in any different way, better or worse. In case there are differences we should all be vaccinated as a community to protect everyone.

How is the J&J vaccine different than Pfizer and Moderna?

This vaccine, like AstraZeneca uses an adenovirus to deliver the COVID proteins needed to generate protection against SARs-CoV-2. Adenovirus are the viruses that can cause the common cold.



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