Vaccine myths: Did you hear the one about...?

10 March 2021 | Julie Roth

If your family and friends are anything like ours, when you shared what you learned in our first article about vaccines, they asked you all sorts of additional questions you never considered. Luckily, our own Arlin Pedrick is well plugged in to the COVID-19 experts and happy to help us out.

“Myths,” she said to most of our questions. “You wouldn’t believe the things that are popping up in social media these days.” She went over them with us, one by one.

There are a lot of them, so use these links to jump down to the ones you want to read:

MYTH: Most people survive COVID-19, so I don't need to get vaccinated

Of the roughly 118 million people around the world who have contracted COVID-19 so far, "only" about 2.6 million have died. So it is true that most people survive the disease. "But," says Arlin, "science cannot yet predict whose case of COVID-19 will be severe or lethal. Even if you do survive, you could pass it along to someone who won't."

> ***"Science cannot yet predict whose case of COVID-19 will be severe or lethal... I wouldn't want to roll the dice."***

Then too, there's a lot of variation in what survival looks like. Some people seem to have long-lasting fatigue or lack of mental clarity, so-called "Long COVID." And doctors are still determining how many people suffer long-term impact to their lungs, heart, kidneys, brain and other organs.

While studies have not yet shown whether the vaccine can prevent such long-term issues, there's no doubt the fewer people who contract the disease, the better.

Says Arlin: "I wouldn't want to roll the dice."

MYTH: I shouldn't get the vaccine because...

Arlin says the vaccines are safe for all adults, even those who:

- have preexisting conditions
- have a suppressed immune system
- have already recovered from COVID-19
- are elderly

If you have a history of allergies or have any other specific concerns, you should speak with your doctor. “Anyone can have an allergic response to any vaccine,” she says, “but very few do (something like 1 in 100,000 have an allergic reaction to the Covid mRNA vaccine).” That’s why everyone should remain at the vaccination site for 15 minutes after getting that shot — and if you have a history of allergies you should stay as long as 30 minutes. If you do have a reaction, you will get a quick treatment to stop it.

If you are pregnant, the guidance from health authorities hasn’t been as clear cut. This is only because pregnant women were not allowed to participate in the vaccine trials. While there is no reason to think that the vaccine will be any less safe for them or their babies, Arlin understands it is scary not to have data proving it.

> ***The active and inactive ingredients in COVID-19 vaccines have been shown to be harmless.***

We do know a few things:

- many women in the vaccine trials got pregnant after getting the shot with no known ill effect
- pregnant women are at greater risk of severe COVID-19
- newborns can get COVID-19
- a mother’s high fever can harm an unborn baby

Therefore, we can be absolutely certain that it is better for the mother and the baby if the mother doesn’t get COVID-19. The vaccine is one way to reduce her risk. But check with your doctor first.

Luckily, Pfizer just started a trial specifically for pregnant women, so we should have more information soon.

MYTH: The vaccine can affect women's fertility

COVID-19 vaccinations will not affect women's ability to bear children in the future. In fact, several women in the trials became pregnant with no known ill effect.

Arlin explains where the myth came from: All of the different COVID-19 vaccines teach our immune system how to recognize and fight cells with spike-shaped proteins like those on the coronavirus, so we're ready if we're exposed to the real coronavirus later.

A report going around social media worries that the body's defenses will mistakenly attack a completely different spike protein the body uses to support the placenta during pregnancy.

"The two spikes are as different to the immune system as the Eiffel Tower and the Burj Khalifa, and our immune system has no difficulty telling them apart," says Arlin. "But whoever wrote the report didn't know that and said the vaccines would cause a woman's body to fight this different protein, too. That's how they wrongly concluded that the vaccines might affect women's fertility."

> ***Vaccines teach your immune system to create antibodies perfectly armed for the coronavirus — like kryptonite for Superman***

"If this myth were true," she says, "then our bodies' unvaccinated response to the coronavirus would have the same effect, and we just haven't seen that."

MYTH: The vaccines can make me test positive for COVID-19

None of the vaccines will give you COVID-19 or make you test positive for the virus. Arlin says the vaccines might make you test positive in some *antibody* tests — just like you would if you had been sick with COVID-19. Antibody tests use a drop of your blood; tests for the virus use nasal swabs or your saliva.

"This is just what we would expect to happen," she says. "The vaccines get your immune system ready to fight the coronavirus. To get ready, your immune system creates antibodies that are perfectly armed against that specific virus, like kryptonite to Superman. After your vaccine, an antibody test should find antibodies (kryptonite) in your blood. If you later get exposed to the virus (Superman), then the tests that look for Superman (PCR and antigen tests) should only find a sad, weak version of him who doesn't hang around long." (You never thought you'd be rooting against Superman, did you?)

MYTH: No one knows what's in the vaccines

Active ingredients

The active ingredient in the Pfizer/BioNTech and Moderna vaccines is mRNA (explained in our first article, and on the CDC site).

The AstraZeneca/Oxford, Johnson and Johnson, and Sputnik V vaccines act similarly but use a modified common cold virus instead of mRNA to deliver the instructions to our cells.

Sinopharm and Sinovac vaccines use the more traditional method involving actual coronavirus, made harmless so that it can't replicate in our cells.

> ***"The mRNA technique is much faster. It is like mixing a protein shake instead of waiting for the hen to lay an egg."***

The Novovax vaccine, however, delivers only the spike proteins themselves. To be effective, this kind of vaccine needs to be combined with other substances to make the immune system pay attention. To do that, Novavax uses a new plant-based substance similar to others that have been used safely for years.

Inactive ingredients

Most of the myths, though, are about the inactive ingredients.

Arlin says most vaccines have sugars and salts added to keep them stable until they can be used. The mRNA vaccines also use lipids, like fats or oils, to coat the

mRNA to protect it and help it enter our cells. Some of these coatings are new, but their structure and activity are well-studied, and there is no reason to worry that they might be harmful.

What's NOT in them

None of the COVID-19 vaccines currently available use ingredients grown in eggs. That is a common method for growing viruses, though, so if you are allergic to eggs, you should know which vaccines are available where you live and ask your doctor if you have any concerns.

These substances are NOT in COVID-19 vaccines and were not used in developing the vaccines:

- bee venom
- fetal tissue
- gluten
- latex
- maize/corn
- milk
- peanuts

These technologies are also NOT present in COVID-19 vaccines:

- implants
- microchips
- tracking devices
- nanotransducers

(The UK government details all the ingredients in the Pfizer/BioNTech, Moderna, and AstraZeneca/Oxford vaccines, if you want to know more.)

It's worth noting that all the vaccines a manufacturer creates are the same. "If you're getting a Pfizer/BioNTech vaccine, it has the same ingredients as the Pfizer/BioNTech vaccine being given in the next neighborhood," says Arlin. "Same for the other vaccines: The one you're getting is the same as they're getting in the next neighborhood, town or country."

MYTH: The vaccines were developed too quickly to be safe

Arlin says, "You will be amazed at all the reasons why the vaccines could be developed so quickly without sacrificing safety and effectiveness." We wanted to be amazed, so we asked her to list them all for us.

Creation

China isolated COVID-19's genetic code and shared it with the scientific community in early January 2020.

That genetic blueprint confirmed that the virus that causes COVID-19 is similar to the ones that cause MERS and SARS, which researchers have been studying for decades.

> ***More than 319 million COVID-19vaccine doses have already been administered in 118 countries around the world.***

The mRNA vaccine process used by Pfizer/BioNTech and Moderna has been in development for 30 years and is much faster than other methods for developing vaccines. It can be made in a test tube and doesn't need to be grown in cells. Arlin says, "It's like mixing a protein shake instead of waiting for the hen to lay an egg."

Then the real time saver was the decision to start mass producing the vaccine before the test results were in. There were no safety consequences here, just the risk of a huge financial loss if the vaccines weren't effective.

Testing

Social media made it easy to rapidly find enough trial volunteers from many different populations. COVID-19 is so widespread globally that those trial volunteers quickly came in contact with enough COVID-19 sufferers to see whether the vaccines worked.

Human vaccine testing is normally done in three phases, and the COVID-19 vaccines are no exception. But for COVID-19 trials, pharmaceutical companies

overlapped the scheduling of those phases a little. And some of the trials tested their vaccine on more people than usual to get more data about effectiveness and side effects faster.

Researchers submitted trial results to regulators as they came in, rather than waiting until all trials concluded.

COVID-19 vaccines, like all vaccines and medications, will continue to be studied for any exceedingly rare or long-term side effects.

Arlin says, “I, personally, am more comfortable taking a new vaccine rather than getting sick with a new virus.”

Funding

Governments invested heavily in research and/or paid for the vaccines ahead of time.

That funding is why pharmaceutical companies were able to begin manufacturing vaccines during their trials — gambling the trials would be successful. When they were, vaccines were already ready to ship.

Collaboration

Because COVID-19 is global, scientists from all over the world were working on it, not just those from a few affected countries. Tens of thousands of research hours collectively happened in weeks, not years.

After previous infectious diseases, like Ebola and Zika, the world developed ways to coordinate its response and produce vaccines faster. One result: national regulators shared information about COVID-19 trials to speed approvals from country to country.

The result, as Bloomberg reports: As of March 10, more than 319 million COVID-19 vaccine doses have already been administered in 118 countries around the world — about 8.2 million doses a day!

MYTH: The vaccines mess with our DNA

We covered this one in our first article, but it bears repeating: The mRNA in the vaccines enter cells but do not enter the parts of the cells where the DNA is.

"Our DNA is kept safely in special parts of our cells that require a code to enter," Arlin explains. "The vaccine's messenger RNA is only in the open part of the cell and only talks to the parts of our cells that produce proteins. It mimics a small part of what the COVID-19 virus itself does when it enters your cells."

MYTH: The vaccines are dangerous

We covered this one in our first article, but it bears repeating: Other than rare allergic reactions, there has been no vaccine-related death or major illness. Arlin tells us the most common side effects of the vaccine are soreness where you got the shot — and sometimes temporary tiredness, headache, chills, fever, and joint and muscle pain as your body builds protection from the virus. But with all the current vaccines on the market globally, the way the vaccines were developed, there is no chance they'll actually give you COVID-19.

Read more

- New York Times: Coronavirus Vaccine Tracker (thorough)
- Bloomberg: Covid-19 Tracker (facts at a glance)
- Nature: The lightning-fast quest for COVID vaccines — and what it means for other diseases (how they were developed so quickly)
- New York Times: Tracking the Global Outbreak (the pandemic itself, in maps and charts)
- CDC: Frequently Asked Questions about COVID-19 Vaccination
- CDC: COVID-19 vaccines (pretty much everything you'd want to know)
- WHO: COVID-19 vaccines (pretty much everything you'd want to know)
- Many health and medical organizations have also addressed vaccine myths. If you'd like to read other takes on these myths, feel free to read what they have to say:
- CDC
- Johns Hopkins Medicine
- The Mayo Clinic
- WHO (video)

Many journalist and fact-checking organizations are also tracking and addressing vaccine myths, from the common to the outlandish:

- AFP (787 falsehoods fact-checked so far)
- Britannica
- Medical News Today

NOTE: Accenture has a contract with an expert in infectious diseases, who reviewed this article before publication. This article was also reviewed by leaders in our safety, HR, and legal departments.