

## ***You have questions about the COVID 19 vaccine . . .***

### ***We want to try to help you!***

#### **Q: Why do we even need a vaccine?**

Stopping a pandemic requires using all the tools available. Vaccines work with your immune system so your body will be ready to fight the virus if you are exposed. Other steps, like covering your mouth and nose with a mask and staying at least 6 feet away from others, help reduce your chance of being exposed to the virus or spreading it to others.

#### **Q: So how good is this new vaccine, and the one that might come out soon?**

A picture can be worth a thousand words. This link provides a nice summary and graph comparing the effectiveness of the Pfizer and Moderna vaccines to other commonly used viral vaccines.

<https://www.businessinsider.com/how-pfizer-coronavirus-vaccine-compares-other-vaccines-2020-11>

#### **Q: This is so new! What's different about this compared to the flu shot I get?**

A lot! First of all, the new COVID 19 vaccine protects you specifically against the virus (Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2)) that causes the COVID 19 disease, and not from the flu. It is also an mRNA vaccine, which is a newer approach to protect against infectious diseases. To trigger an immune response, many vaccines put a weakened or inactivated germ into our bodies. Not mRNA vaccines. Instead, they teach our cells how to make a protein—or even just a piece of a protein—that triggers an immune response inside our bodies. That immune response, which produces the protective antibodies, is what protects us from getting sick if the real virus enters our bodies.

The Pfizer vaccine released for use by the FDA's EUA on December 11, 2020 also requires two separate shots. After the first injection is given, a second injection is required "3 weeks" later according to the FDA Prescribing Information.

#### **Q: So how *do* these new vaccines work? How are they going to help protect me?**

Glad you asked! Understanding something is really important to avoid fear of the unknown. COVID-19 mRNA vaccines give instructions for our cells to make **a harmless piece** of what is called the "spike protein." The spike protein is found on the surface of the virus that causes COVID-19, and teaching our immune system to recognize it and be ready for it is what protects us. If our immune system is ready for "the real thing" it can fight it off better! COVID-19 mRNA vaccines are given in the upper arm muscle. Once the instructions (the mRNA) are inside the muscle cells, those cells use them to make the spike protein piece. After the protein piece is made, the cell breaks down (*destroys*) the instructions and gets rid of them. Next, the cell displays the protein piece on its surface. This is where it gets exciting! Now our immune systems recognize that the protein doesn't belong there – it's an "invader" and begin building an immune response and making antibodies, like what happens in natural infection against COVID-19. That's why you might feel achy and get a fever, *because your body is learning and fighting!* BUT – it's only fighting this spike protein, which can't harm you like COVID 19 can.

At the end of the process, our bodies have learned how to protect against future infection. The benefit of mRNA vaccines, like all vaccines, is those vaccinated gain this protection without ever having to risk the serious consequences of getting sick with, *or die from*, COVID-19.

#### **Q: RNA! Isn't that like DNA? Are these things going to affect my genes?**

No! RNA and DNA sound similar, but they're quite different! *The mRNA in the vaccines does not affect or interact with our DNA in any way.* The mRNA never enters the nucleus of the cell, which is where our DNA (genetic material) is kept, and the cell breaks down and gets rid of the mRNA soon after it is finished using the instructions.

**Q: Can I get COVID 19 from the vaccines?**

No, you can not get COVID 19 from the Pfizer or Moderna vaccines. There is NO virus in them. The Moderna and Pfizer vaccines contain manufactured mRNA molecules that carry the instructions for building the virus' spike protein. The mRNA does not enter the cell nucleus or interact with your DNA. And because it's so fragile, it is destroyed quite quickly. To keep that from happening before cell entry, the mRNA molecules are cushioned in protective fats.

**Q: You said two doses are needed. Does anyone know what happens if I miss the second dose? How about if I get it early, or late?**

The second doses of the Pfizer and Moderna vaccines are meant to be taken 21 and 28 days later, respectively. We really don't know much about missing the second dose, or even taking it early or late. It wasn't studied. It's reported that you probably will get *some* protection if you only get one shot, *but authorities do not recommend this approach!* Some experts think that getting it much too early may be worse than getting it a bit late. It seems safest to get the vaccine at the interval approved by the FDA.

**Q: What happens between the two shots?**

Nothing, really, except your body starts building its defenses against COVID 19. Just as you should continue to wear your mask, wash your hands often and stay at least 6 feet away from others, as you'll need to do after both shots, you should continue to protect yourself. If you have a severe reaction after your first shot (unlikely), you should discuss that with your primary care provider or the providers at the vaccination site before you get the second injection.

It's also very important, particularly if and when a second (or more) vaccine is approved *that you get the right one.* The FDA Prescribing Information currently states that there are no data on the "interchangeability" of one for the other. If you get the Pfizer vaccine for your first shot, Prescribing Information indicates that you need to get the Pfizer vaccine for the second.

**Q: Can I stop wearing this mask and get back to my normal life once I get the 2 shots?**

*REALLY, really glad you asked that question!* NO, you should not. The vaccines are good, but they aren't perfect. If a vaccine is 95% effective that basically means that even if you got it, you still have a 5% chance of getting sick. While we continue to learn about all of this, it's *critical* for everyone to continue using **all the tools** available to us to help stop this pandemic. Everyone needs to continue using masks properly, washing hands often, and staying at least 6 feet away from others and avoiding large gatherings until national and international experts advise us all otherwise.

It's also very important to understand that the existing studies of the new vaccines only measured whether vaccinated people *developed symptoms (got sick)*, not whether they got infected. It's possible that they got light infections — not enough to make them ill, but enough to pass the virus on to others. So until we know more, it remains critical to continue all the protective measures that we've been doing. This is recommended by CDC and the scientists who were involved in the studies.

**Q: There might be more than one vaccine coming out. Which one should I get? Should I wait?**

Wow! You're really asking some tough ones! We simply don't know yet. Right now there isn't much choice. Only the Pfizer vaccine has been granted an EUA so far. A vaccine that works in similar ways made by Moderna is expected to get that authorization, too. Even with two of them, however, you still probably won't have much choice, particularly early on. It may just depend on what the providers near you are able to get. But it's important to know that the measures of the safety and effectiveness of the two vaccines seem roughly comparable. Other vaccines under development use different approaches to the same end. Some of the candidate vaccines are single dose, while others (including Pfizer's and Moderna's) require two shots. Some of the vaccines, particularly the Pfizer one, must be kept extremely cold.

FDA guidelines to prescribers issued Friday 12/11/2020, note only that "immunocompromised persons, including individuals receiving immunosuppressant therapy, *may have a diminished immune response*" to the Pfizer vaccine. As more vaccines are evaluated it may turn out, for example, that elderly people with weakened immune systems might be more responsive to one type of vaccine over another. Or it could be that a company decided not to test a sub-group — say, children under 12 — but another manufacturer did. Finally, just for ease, if a safe and effective vaccine is approved that only requires one shot, that may fit best for a lot of people. Discuss this further with your physician.

*But*, it doesn't mean that it's a good idea to "hold out" for something that might or might not come, or be known, maybe even for years. Remember, the FDA has just given emergency use authorization to the Pfizer vaccine as safe and effective!

**Q: I already had COVID-19 or had a positive antibody test. Do I still need to get the vaccine?**

Right now, the exact answer to this excellent question is unknown. It's probably going to happen without planning anyway, since we know that many people who turn out to be "COVID positive" didn't or don't even know it (many people are infected and they don't know it because they never develop any symptoms, which is one of the many problems with the infection; *everyone* has to be careful because they could pass the virus on without knowing it), and testing for COVID is not required to get the vaccination. It does look, however, like getting vaccinated if you've been infected in the past probably isn't harmful. In both the Pfizer and Moderna trials, about 5% to 10% of volunteers turned out to have already been infected. And some experts say the extra protection of immunization might be helpful. But the CDC is waiting until there is more information about how long "natural immunity" lasts to give advice about that to people who at definitely know they were infected. We do know that the vaccine tends to produce antibody titers towards the higher end of the spectrum, suggesting better immunity with vaccination than after natural infection. *Keep listening to the news and CDC/FDA guidance as we learn more about COVID 19 itself and the vaccines.*

**Q: This vaccine has never been used in humans. How do we know it's safe?**

Well, it's not exactly correct that it's never been used in humans. Remember, no short cuts here! All of the normal test phases required by the FDA were completed for these vaccines. The Pfizer phase 3 trial included more than 43,000 people, and Moderna's had more than 30,000. The first humans received mRNA-based COVID-19 vaccines in March.

As with any vaccine that gains approval, monitoring will continue. Indeed, it's mandated by *Federal law*. And that's already started! UK health officials reported that two healthcare workers vaccinated in the initial rollout of the Pfizer vaccine had what seems to have been a severe allergic response. *Both had a history of anaphylactic [life threatening] allergic responses and carried Epi-Pens, and both recovered.* During the trial, allergic reaction rates were 0.63% in the vaccine group and 0.51% in the

placebo group. As a result of the two reactions, UK regulators now recommend that patients with a history of severe allergies not receive the vaccine at the current time.

The FDA here in the U.S. has carried over this advice in its official prescribing information, so you are likely to be asked this question (history of life-threatening allergic reaction(s)) before you get your shot.

**Q: Were these vaccines made “too fast?”**

Well, it might seem that way. All this just started in late 2019 and early 2020. Wow! Barely a year from when I first heard about it to getting a vaccine approval on December 11, 2020. But hold on! Tremendous amounts of research work, energy, thought and money goes into *anything* before it reaches us. That cell phone you’re using didn’t just pop up overnight! People worked on the technology behind the scenes for many years before it became “ready for prime time.” In the same way, mRNA vaccine work began in the 1990s. Improvements in technology in the last decade have meant that their use has become feasible, and they have been tested in animals against many viral diseases. The mRNA vaccines are attractive because they’re expected to be safe and easily manufactured from common materials. Design of the spike protein mRNA component for COVID 19 began as soon as the viral genome became available in January 2020. Historically, creating a vaccine takes years, so less than a year can seem like moving too fast. But that’s mostly for manufacturing and distribution. The technology has been tested for nearly 30 years!

And this is just the beginning! Just like the Apollo space program brought so many wonderful things into our lives, the COVID 19 emergency is opening doors for fantastic new ideas that are likely to help us all! There has to be something good that comes out of this, right? Future mRNA vaccine technology may allow for one vaccine to provide protection for multiple diseases, thus decreasing the number of shots needed for protection against common vaccine-preventable diseases. And beyond vaccines, *cancer research has used mRNA* to trigger the immune system to target specific cancer cells.

What underlies the speed was a restructuring of the normal vaccine development process. The same phases of development — animal testing, a small initial human phase, a second for safety testing, a third large phase for efficacy — were all conducted as for any vaccine. *But some phases were completed in parallel, rather than sequentially.* This approach has proved so successful that there is already talk about making it the model for developing future vaccines.

Two other factors contributed to the speed. First, gearing up production can slow a rollout, but with these vaccines, companies ramped up production even before anyone knew if the vaccines would work, in part because the mRNA technology is simpler than older techniques that are behind other vaccines you’ve received. The second factor has been the large number of cases, making exposures more likely, thus accelerating the results of the efficacy trials. There is so much COVID 19 being transmitted in the United States that it did not take long to show that they worked.

**Q: Can patients of color feel safe getting the vaccine?**

This is an extremely important question and has been addressed in the trials to a greater extent than with most medicines currently available because it’s so important. This, together with many other questions were considered by the FDA advisory committee when they overwhelmingly recommended the EUA that was then issued on December 11, 2020. Thus far there were no safety signals that differ by race or ethnicity, according to data submitted by the companies to the advisory committee. The Pfizer phase 3 trial enrolled just over 9% Black participants, 0.5% Native American/Alaska Native, 0.2%

Native Hawaiian/Pacific Islander, 2.3% multiracial participants, and 28% Hispanic/Latinx. For its part, Moderna says that approximately 37% of participants in its phase 3 trial come from communities of color.

And it's very important to know that according to the FDA the analysis of subgroups given the vaccine showed that it works just as well no matter what age group, gender, racial or ethnic groups to which you belong.

**Q: Will I need a doctor's order (prescription) to get the vaccine?**

As it stands right now, we are not aware of any requirement for this, but this may change. As the vaccine initially becomes available, there will not be enough for everyone to get it, so based on expert recommendations, the initial supply will be restricted to certain groups – likely health care providers and residents of nursing homes and their caregivers. Health care providers are on the front lines of the fight and most exposed to the disease in high numbers, increasing their chance of getting it, and we need them to be safe to be able to provide the care that everyone needs. Our family members who live in nursing homes have been shown to be the most vulnerable to COVID 19, so they're high priority because their risk of dying is so high. And their caregivers need to be protected so that they can not only give the needed care, but so that they don't unknowingly pass it to the people in their care. Emergency medical personnel (ambulance squads, for example) and public servants such as the police, who are out in the community) will also probably be at the head of the line.

Once these highest risk groups are vaccinated, and more vaccine rapidly becomes available then there will likely be additional prioritization, until finally there's so much vaccine available that anyone who wants it can easily get it. If there is a "middle ground" between the first priority groups and the general population, there might be a time that a doctor's note or prescription could be needed. We'll be paying attention to this with you so that if something is needed, we can get you what you might need.

**Q: How am I going to pay for it?**

Directly, cash out of pocket, you probably won't have to pay anything for it, so *this concern should not stop you from getting it if you want it. If you run into financial concerns, please contact your primary care doctor or local civic health center.* Vaccine doses purchased with U.S. taxpayer dollars will be given to the American people at no cost. However, vaccination providers will be able to charge an administration fee for giving the shot to someone. Vaccine providers can get this fee reimbursed by the patient's public or private insurance company or, for uninsured patients, by the Health Resources and Services Administration's Provider Relief Fund.

**Q: Can I get other vaccinations with the COVID 19 vaccine?**

Again, directly from the FDA approved Prescribing Information document. "There are no data to assess the concomitant administration of the Pfizer-BioNTech COVID-19 Vaccine with other vaccines."

**Q: What are the likely side effects?**

So far, the most common side effects are pain at the injection site and an achy, flu-like feeling. More severe reactions have been reported but were not common in the trials. The common side effects are generally considered a good sign, signaling that the recipient is generating a strong immune response. The majority of the side effects are most likely to occur within the first 48 hours of receiving the injection. With *any* vaccine (or any medicine) there is a *range* of reaction severity. It is true that some recipients may have a very strong reaction – like severe body aches, very high fever, severe headache.

In some cases, such a reaction might even be significant enough to require time off work. If that happens, you should seek medical advice.

It is true that we don't know about possible long term side effects. But remember, we sure do know what COVID can do to us! Getting the disease has very real and dangerous (death) risks! So we have to consider the *benefits* of the vaccine – reducing your risk of getting a deadly disease, against potential risks of the vaccine. The FDA, as well as similar agencies thus far in England and Canada, have very carefully considered the data and have certified the Pfizer vaccine as safe and effective.

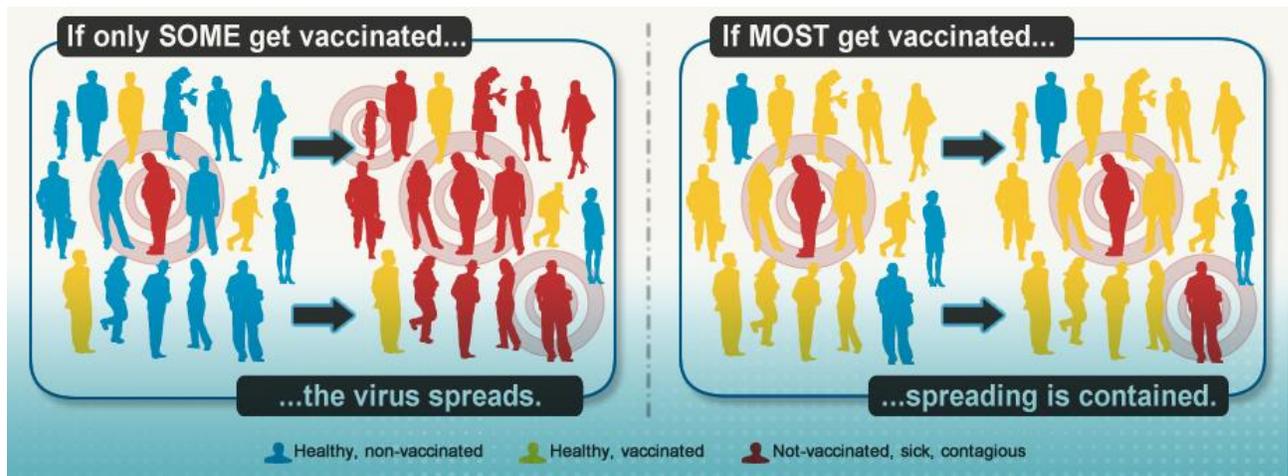
**Q: Do I *have* to get it? I'm still scared. I'm really not sure this is the right thing for me.**

Well, no, you don't *have* to get it. It's not mandatory. But getting it is a really good idea for most people who haven't had COVID 19 or don't have a history of life-threatening allergies. If you're not sure about your particular situation, you need to have a discussion with your personal doctor.

But consider for a moment, as you make this extremely important decision, how much vaccinations have changed the world and our lives for the better. Smallpox, polio, measles, mumps, "German" measles (rubella), diphtheria, pertussis (whooping cough), tetanus, rabies, hepatitis; the list goes on and on. Virtually no one alive today has ever even seen or heard about someone with most of those other diseases, let alone experience someone *dying* from one of them. Yet this was an everyday occurrence before we had *vaccines* against them!

Just to give you some specific examples of how vitally important vaccines and vaccinations are, consider the following information provided by the CDC and WHO:

- Nearly everyone in the U.S. got measles before a vaccine, hundreds died from it each year. Today, most doctors have never even seen a case of it.
- Smallpox. On average, 3 out of every 10 people who got it died. Those who survived were usually left with scars, sometimes severe. During the 20<sup>th</sup> century alone, globally *300 million died* from it. In contrast, 100 million people died during the same 100 years either directly or indirectly because of armed conflicts. Thanks to vaccination, the last natural outbreak of smallpox in the US was in 1949. *In 1980*, the World Health Assembly *declared smallpox eradicated* (eliminated). No cases of naturally occurring smallpox have happened since.
- Polio is close to being eliminated. Four regions of the world are polio free. *Without polio eradication efforts, more than 17 million people who are currently healthy would have been paralyzed by the virus.*
- More than 15,000 Americans died from diphtheria in 1921, right before a vaccine. Only two cases of diphtheria were reported to CDC in the *ten years* between 2004 and 2014!
- An epidemic of rubella (German measles) in 1964-65 infected 12½ million Americans, killed 2,000 babies and caused 11,000 miscarriages. In the six years between 2012 and 2018 only 15 cases were reported to CDC!



CDC, <https://www.cdc.gov/vaccines/vac-gen/whatifstop.htm>

See why it's so important?

**Q: What if I get the vaccination and I have a bad reaction? What do I do?**

If you experience any symptoms that concern you, or seem out of the ordinary, you will need to obtain specific medical guidance. If you feel that it's an emergency, call 911 immediately or go to the nearest emergency department. Otherwise, please contact the location at which you received the vaccine (you should be getting information on this when you get the vaccination shots). Beyond that, you can contact your primary care doctor for additional advice.

CDC and FDA also encourage anyone who gets the vaccine to report possible side effects (called adverse events) to the *Vaccine Adverse Event Reporting System (VAERS)*. This can be found at <https://vaers.hhs.gov/reportevent.html> or you can just Google something as simple as "Report a bad reaction" which will immediately bring up both the FDA and VAERS links.

VAERS is a national system that collects these reports to look for adverse events that are unexpected, appear to happen more often than expected, or have unusual patterns of occurrence. Reports to VAERS help CDC monitor the safety of vaccines and *safety is a top priority*.

Healthcare providers also will be required to report certain adverse events following vaccination to VAERS. Healthcare providers also have to adhere to any revised safety reporting requirements according to FDA's conditions of authorized use throughout the duration of any Emergency Use Authorization.

In addition, CDC reports that they will be implementing a new smartphone-based tool called **v-safe** to check-in on people's health after they receive a COVID-19 vaccine. When you receive your vaccine, you should also receive a **v-safe** information sheet telling you how to enroll in **v-safe**. If you enroll, you will receive regular text messages directing you to surveys where you can report any problems or adverse reactions you have after receiving a COVID-19 vaccine.

**Q: It says to avoid the vaccine if you are allergic to any of its components. How do I know what that means?**

According to a release from the American College of Allergy, Asthma and Immunology (ACAAI), allergic reactions to vaccines, in general, are rare. The incidence of anaphylaxis (the most severe form of reaction) is estimated at 1.31 in 1 million doses given. It's also recommended that you remain at the

location where you got the vaccination for 20-30 minutes, so that if you do have a reaction, it can be quickly treated. It's planned that injection locations will have on hand all of the medications commonly used to treat the range of allergic reactions.

ACAAI notes in its release of 12/14/2020 that "individuals with common allergies to medications, foods, inhalants, insects, and latex are no more likely than the general public to have an allergic reaction to the Pfizer COVID-19 vaccine. Those patients should be informed of the benefits of the vaccine versus its risks."

Specifically, however, the ACAAI recommends that the Pfizer vaccine "should not be administered to individuals with a known history of a severe allergic reaction to polyethylene glycol [emphasis ours] as it is a component of this vaccine that is known to cause anaphylaxis."

The FDA lists the components (ingredients) of the Pfizer COVID 19 vaccine as follows, so if you do have a known allergic reaction to any of these items, you should discuss the vaccine with your personal physician before getting it:

- mRNA,
- Lipids ((4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate), 2 [(polyethylene glycol)-2000]-N,N-ditetradecylacetamide, 1,2-Distearoyl-sn-glycero-3-phosphocholine, and cholesterol),
- Potassium chloride,
- Monobasic potassium phosphate,
- Sodium chloride,
- Dibasic sodium phosphate dihydrate and
- Sucrose

#### **Q: What is an "adverse event (reaction)"**

An "adverse event" is any health problem that happens after a shot or other vaccine. An adverse event might be truly caused by a vaccine, or it might be pure coincidence.

- **True reactions to the vaccine.** These include both common, known side effects and serious reactions, like allergic reactions.
- **Side Effect.** A side effect is any health problem shown by studies to be caused by a vaccine. Like any medication, vaccines can cause side effects. Usually vaccine side effects are minor (for example, a sore arm where a shot was given or a low-grade fever after a vaccine) and go away on their own within a few days.
- **Unrelated health problems.** These are experiences that would have occurred even if the person had not been vaccinated. They happen after vaccination but are not caused by the vaccine.
- **Health problems that cannot be related directly to the vaccine.** The cause of these events is unknown, and there is not enough evidence to say whether they are caused by a vaccine.

#### **Q: Is there anything else I can do to reduce my chance of getting COVID 19?**

Yes! Continue to follow all of the CDC guidelines, like wearing your mask properly (the right size, not loose and slipping off your face, covering your mouth *and* nose completely), washing your hands frequently, staying 6 feet away from others, minimizing your contact with someone who's clearly sick and avoiding large groups of people. Keep an eye out on the current situation. Remember, if the test positivity rate in your area is, let's say, 10%, that means that roughly one out of 10 people you get near actually has the virus, whether they "look like it" or not! ***As long as your personal physician agrees,***

**get a flu shot!** It won't stop you from getting COVID 19, but it can do two things – reduce your chance of getting BOTH infections together AND reduce your chance of getting the flu and having to be hospitalized for something preventable when your community needs the beds for COVID 19 patients.

### Other questions?

**Please ask your doctor, because if you have a question, someone else probably does, too, and we'd like to update this for all of our patients!**

**Thank you!**

**Your Health Care Team at  
Cardiology Specialists of Virginia**

### Glossary

CDC	United States Centers for Disease Control
Coronavirus	Coronaviruses are a large group of viruses that cause diseases in animals and humans. In humans, the viruses can cause mild respiratory infections, like the common cold, but can lead to serious illnesses, like pneumonia. Coronaviruses are named for the crown-like spikes on their surface. Human coronaviruses were first identified in the mid-1960s.
COVID 19	On February 11, 2020, the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV." It is predominantly a respiratory illness that can affect other organs. People with COVID-19 have reported a wide range of symptoms, ranging from mild symptoms to severe illness. Symptoms may appear 2 to 14 days after exposure to the virus. Symptoms may include: fever or chills; cough; shortness of breath; fatigue; muscle or body aches; headache; new loss of taste or smell; sore throat; congestion or runny nose; nausea or vomiting; diarrhea.
DNA	<b>Deoxyribonucleic Acid</b> is the chemical name for the molecule that carries genetic instructions in all living things. The DNA molecule consists of two strands that wind around one another to form a shape known as a double helix. Each strand has a backbone made of alternating sugar (deoxyribose) and phosphate groups. Attached to each sugar is one of four bases--adenine (A), cytosine (C), guanine (G), and thymine (T). The two strands are held together by bonds between the bases; adenine bonds with thymine, and cytosine bonds with guanine. The sequence of the bases along the backbones serves as instructions for assembling protein and RNA molecules.
EUA	Emergency Use Authorization. This authority allows FDA to help strengthen the nation's public health protections against Chemical, Biological, Radiological and Nuclear (CBRN) threats by facilitating the availability and use of Medical Countermeasures (MCMs) needed during public health emergencies (such as COVID 19).
FDA	United States Food and Drug Administration
Immunity	Protection from an infectious disease. If you are immune to a disease, you can be exposed to it without becoming infected.
Immunization	A process by which a person becomes protected against a disease through vaccination. This term is often used interchangeably with vaccination or inoculation.
RNA	<b>Ribonucleic Acid.</b> Ribonucleic acid is a molecule similar to DNA. Unlike DNA, RNA is single-stranded. An RNA strand has a backbone made of alternating sugar (ribose) and phosphate groups. Attached to each sugar is one of four bases--adenine (A), uracil (U), cytosine (C), or guanine (G). Different types of RNA exist in the cell: messenger RNA (mRNA), ribosomal RNA (rRNA), and transfer RNA (tRNA). More recently, some small RNAs have been found to be involved in regulating gene expression.
SARS	Severe acute respiratory syndrome (SARS) was a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. The illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.

SARS-CoV-2	This is the name of the specific coronavirus that has caused the worldwide pandemic disease called COVID 19. It is a distinct coronavirus, different from the SARS-CoV virus that caused the earlier 2003 outbreak.
Vaccination	The act of introducing a vaccine into the body to produce immunity to a specific disease.
Vaccine	A product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease. Vaccines are usually administered through needle injections, but can also be administered by mouth or sprayed into the nose.
VAERS	Vaccine Adverse Event Reporting System. A national system that collects these reports to look for adverse events that are unexpected, appear to happen more often than expected, or have unusual patterns of occurrence
WHO	World Health Organization

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