



## **Understanding COVID-19 Vaccines**

**By Dr. Rhonda Sneeringer**

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There's a good chance you or someone you know will soon get a COVID-19 vaccine. El Dorado County is in Phase 1B-Tier 1, which allows residents in certain age categories to now receive a vaccine, along with other identified essential worker categories.

This is great news. The more people who vaccinate, the sooner we will again be able to safely engage in more activities. Many people ask how the vaccines do and don't do, and how they work in our bodies. Here's an overview.

### **What each vaccine does**

COVID-19 vaccines currently available in the United States have been shown to be highly successful at preventing symptomatic COVID-19 – with an efficacy rate up to 95 percent. Based on early data from clinical trials, experts believe that getting a COVID-19 vaccine will help keep you from getting seriously ill even if you do get COVID-19.

However, we do not yet know if the vaccine *prevents* a person from spreading COVID-19. For now, the CDC recommends that those who have been vaccinated continue to wear a mask and practice social distancing until most people in the country are also vaccinated, which should result in significantly less transmission.

### **Vaccine Types**

As most people now know, the two vaccines already authorized and recommended in the U.S. to prevent COVID-19 are made by Pfizer/BioNTech and Moderna. A third – made by AstraZeneca – has been approved for use in the United Kingdom, and is among a handful of additional vaccines undergoing large-scale, Phase 3 clinical trials on U.S. residents. Any of these could be approved later this year.

There are some differences in the vaccines, summarized in the chart below, but the Federal Drug Administration will only approve for emergency use those that meet rigorous testing standards in place in the U.S. for decades.

## **How vaccines work**

Vaccines can work in different ways, but it's important to know that none of the vaccines can or will give a person COVID-19 nor will a COVID test result show positive because you received the vaccine.

All of the U.S.-approved vaccines have undergone rigorous study and Stage 3 trials on millions of Americans before receiving “emergency authorization” for use. The expedited process did not skip steps, but was expedited for two reasons: first, federal funding supported the trials; secondly, due to COVID-19 being widespread, it was easy to meet the number of people needed in the study for it to be valid. These vaccines received this emergency designation because the world urgently needs a COVID-19 vaccine to stop the spread of this highly contagious disease. More than 400,000 people have died in the U.S. and more than 2 million have died around the world in a little more than a year.

In the U.S., all the approved COVID-19 vaccines as well as those in trial stages, fall into three categories: mRNA vaccine, protein-based vaccines and vector vaccines.

mRNA stands for “Messenger RNA.” These vaccines send a code – a messenger – into our cells that teach our immune system how to make a spike protein that looks like the protein on the outside of the COVID-19 virus. This causes our body to identify the protein as foreign and cells then remember how to fight the virus that causes COVID-19 with newly trained antibodies if we are infected in the future. Both the Pfizer and Moderna vaccines are mRNA vaccines.

**Vector vaccines and protein-based vaccines are other vaccines commonly used and likely to be among those authorized this year in the U.S. to prevent COVID-19.**

A vector vaccine uses a modified version of a different virus to deliver important instructions to our cells. For COVID-19 vector vaccines, the vector (which is not the virus that causes COVID-19, but a different, harmless virus) enters a cell in our body and uses the cell's machinery to produce a harmless piece of the virus that causes COVID-19. This piece is known as a “spike protein” and it is only found on the surface of the virus that causes COVID-19.

Protein-based vaccines are somewhat similar. The one that is currently being developed takes a copy of the coronavirus spike protein and directly injects it into your body for your immune system to attack and learn how to destroy.

When the cell displays the spike protein on its surface, our immune system recognizes it doesn't belong there and begins producing antibodies and activating other immune cells to fight off what it thinks is an infection. At the end of the process, our bodies have learned how to protect us against future infection with the virus that causes COVID-19.

## **The Bottom Line**

Getting vaccinated is one of many steps you can take to protect yourself from COVID-19. Protection from COVID-19 is critically important because for some people, it can cause severe illness or death.

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 masks and social distancing, help reduce your chance of being exposed to the virus or spreading it to others.

### Vaccine specifics

<b>Developer</b>	<b>Type</b>	<b>Status</b>	<b>Efficacy</b>	<b># of shots</b>	<b>Minimum age</b>	<b>Storage</b>
<b>Pfizer/BioNTech</b>	<b>mRNA</b>	<b>Approved for use</b>	<b>95%</b>	<b>2 shots 21 days apart</b>	<b>16</b>	<b>-94 degrees</b>
<b>Moderna</b>	<b>mRNA</b>	<b>Approved for use</b>	<b>94.1%</b>	<b>2 shots, 28 days apart</b>	<b>18</b>	<b>-94 degrees</b>
<b>AstraZeneca-Oxford</b>	<b>Vector</b>	<b>In Stage 3 trials (approved in United Kingdom)</b>	<b>70% (estimated), on par with the flu shot</b>	<b>2 shots, a month apart</b>	<b>18</b>	<b>Normal refrigeration</b>
<b>Janssen (Johnson &amp; Johnson)</b>	<b>Vector</b>	<b>In Stage 3 trials</b>	<b>Unknown</b>	<b>1</b>	<b>Unknown</b>	<b>Normal refrigeration</b>
<b>Novavax</b>	<b>Protein-based</b>	<b>In Stage 3 trials</b>	<b>Unknown</b>	<b>2</b>	<b>18</b>	<b>Unknown</b>

For more information on the efficacy of vaccinations please visit [bartonhealth.org/coronavirus](http://bartonhealth.org/coronavirus).

To find more information about county public health vaccination eligibility please visit El Dorado County at [edcgov.us](http://edcgov.us) or Quad Counties at [gethealthycarsoncity.org](http://gethealthycarsoncity.org).

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