Understanding COVID-19 Vaccines

A guide to learning about COVID-19 vaccines

NYC HEALTH+ HOSPITALS

May 19, 2021
Version 3

About This Guide

This guide shares information about vaccination and COVID-19 vaccines, to help answer your questions and address your concerns. You will find information to help keep you, your family and community safe. You will be able to use what you learn and be empowered to make decisions that work for YOU. You have a voice, and can also share this knowledge with your loved ones, on social media, or in your community.

A Glance at What's Inside

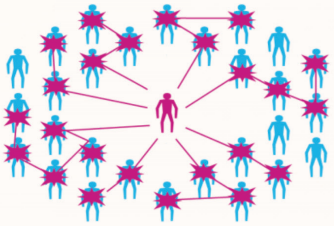
Section 1

Understanding Vaccination and Immunity

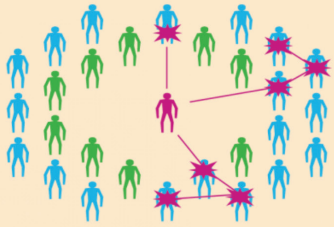
The Importance of Vaccination

- COVID-19 vaccination is a safe way to help the immune system build protection against COVID-19.
- **Getting vaccinated reduces the risk of severe disease, hospitalization and death.**
- Getting vaccinated in addition to practicing public health precautions is a great way to provide protection against the virus.
- Vaccination helps with community immunity, or herd immunity, which will reduce the spread of disease.
- **The more people who get vaccinated, the sooner we can end the pandemic.**

How Herd Immunity Works



When no one has immunity, contagion has many opportunities to spread quickly.



The more immunity we have in the system, the less often contagion* comes into contact with the susceptible.

Spread of contagious disease is contained.

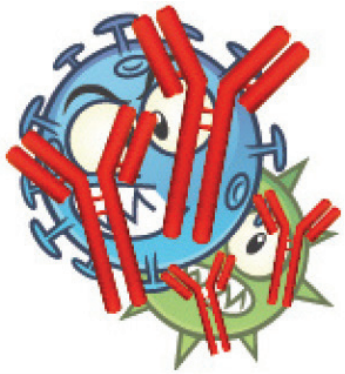
www.ucdavis.edu/sites/default/files/2020/herd_immunity_3.png

*__Contagion__ is another way of referring to a virus.

How Do Vaccines Work?

- When germs, such as the virus that causes COVID-19, invade our bodies, they attack and multiply. This causes infection and illness.
- Our immune system uses several tools to fight infection, such as antibodies and specific immune cells called B and T lymphocytes.
- Vaccines are used to help the immune system create immune cells and antibodies in order to prevent illness.
- After vaccination, the body is left with a supply of "memory" cells and **antibodies that will recognize and remember how to fight specific germs in the future.**
- Like many other vaccines, the COVID-19 mRNA vaccines require two doses to build protection.
- The Johnson & Johnson (Janssen) COVID-19 adenovirus vaccine requires one dose to build protection.

The vaccine sparks your immune system to respond, by developing antibodies that remember the germ. > **The antibodies fight off the germ if it invades again.**

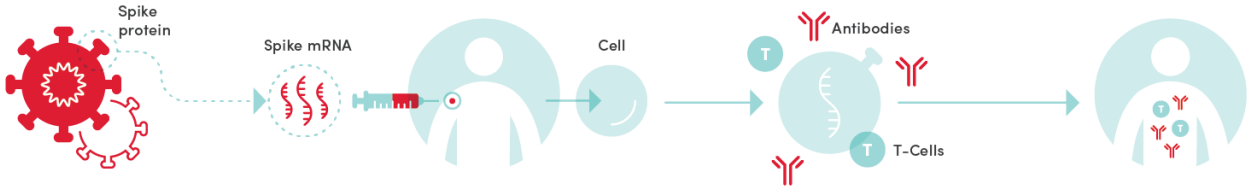


Adapted from: www.mayoclinichealthsystem.org/hometown-health/speaking-of-health/vaccine-safety-6-common-questions-answered

What are mRNA Vaccines?

- Pfizer BioNTech and Moderna COVID-19 vaccines are messenger RNA (mRNA) vaccines.
- mRNA vaccines teach cells how to make a **harmless piece of the spike protein**, which is found on the surface of the COVID-19 virus.
- This protein then triggers an immune response to make antibodies that protect against COVID-19.
- **After our cells make copies of the protein, they destroy the mRNA from the vaccine.**
- **mRNA does not enter the nucleus of your cells where DNA is stored and does NOT affect your DNA.**

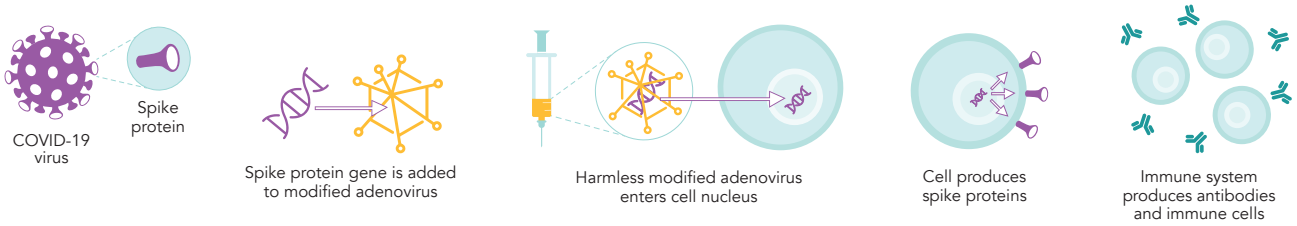
HOW MRNA COVID-19 VACCINES WORK



What are Adenovirus Vector Vaccines?

- Adenoviruses are common viruses that typically cause colds or flu-like symptoms.
- The Janssen COVID-19 vaccine is a modified harmless adenovirus. It contains the gene for the coronavirus spike protein that enters the cell, but can't make copies or cause illness. It only produces the coronavirus spike protein.
- The immune system will then respond to the spike protein, which allows it to recognize and fight off a future infection by the virus.

HOW ADENOVIRUS VECTOR VACCINES WORK



Natural Immunity and Vaccine-Induced Immunity

The immunity someone gains from having an infection, called natural immunity, varies from person to person. We are still learning about how long someone can be protected after recovering from COVID-19.

Vaccination is important even if you already had COVID-19 infection, because:

- Re-infection with COVID-19 is possible.
- Research is ongoing to find out how long immunity lasts.
- Vaccination provides strong immunity.

Quick Facts on Adolescents and COVID-19 Vaccination

- Adolescents are at risk for COVID-19 infection, severe illness, hospitalization, and death, and represent an increasing proportion of recent COVID-19 cases.
- Adolescents who get infected with COVID-19 may also indirectly impact others' health, including older vulnerable populations, and contribute to transmission in households and communities.
- Pfizer-BioNTech COVID-19 vaccine for adolescents is safe and has gone through the same stringent and rigorous process for authorization.
- In clinical trials, vaccinated adolescents had robust antibody response, the side effects were well tolerated, and the vaccine showed **100% efficacy** in preventing symptoms of COVID-19 in adolescents aged 12-15.

Authorized Age Groups	≥ 12 Years
Number of doses in series	2 doses
Interval between first and second doses*	3 weeks
Dose volume	0.3ml
Route	Intramuscular

www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-05-12/04-COVID-Oliver-508.pdf

Section 2

Vaccine Development, Safety, and Efficacy

Accelerated Vaccine Production

It is normal to have questions about the quick development of COVID-19 vaccines, since vaccines usually take years to be developed. There were many factors that led to quicker vaccine production:

A HEAD START

Scientists learned from previous research on viruses similar to COVID-19 (like MERS and SARS). mRNA technology has been studied for over a decade, paving the way for efficient development of mRNA vaccines.

Adenovirus-based vaccines have been studied for years as well, and are currently being studied for HIV and Zika virus. Recently, an adenovirus-based vaccine for Ebola was approved for general use.

COUNTRIES WORKING TOGETHER FOR A COMMON GOAL

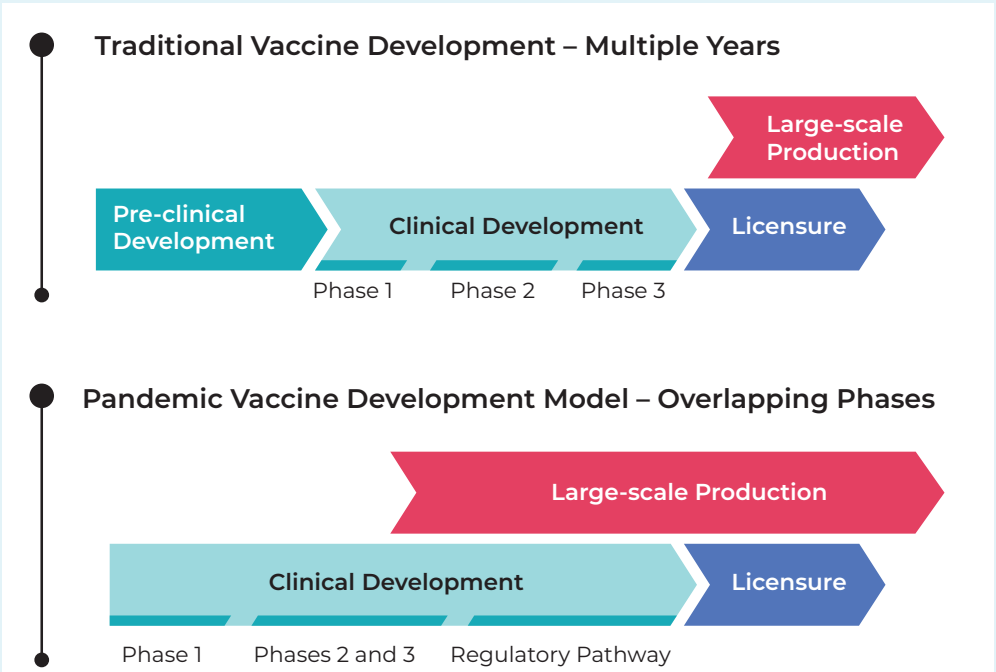
Existing knowledge around vaccine technology and **continuous information sharing by researchers around the world allowed scientists to study and create effective vaccines.**

INVESTMENTS

Developing a vaccine usually can take years to raise money, but due to the high demand for a COVID-19 vaccine, **the US Congress gave over $12 billion to fund vaccine research and development.**

OVERLAPPING PHASES OF VACCINE DEVELOPMENT

Vaccine development is typically done in a step by step process. **To speed up the process, many steps were done simultaneously in an efficient and coordinated manner.**



EFFICIENT CLINICAL TRIALS

COVID-19 vaccines have gone through the same rigorous safety assessments and clinical trial phases as other vaccines.

No steps were skipped during these processes.

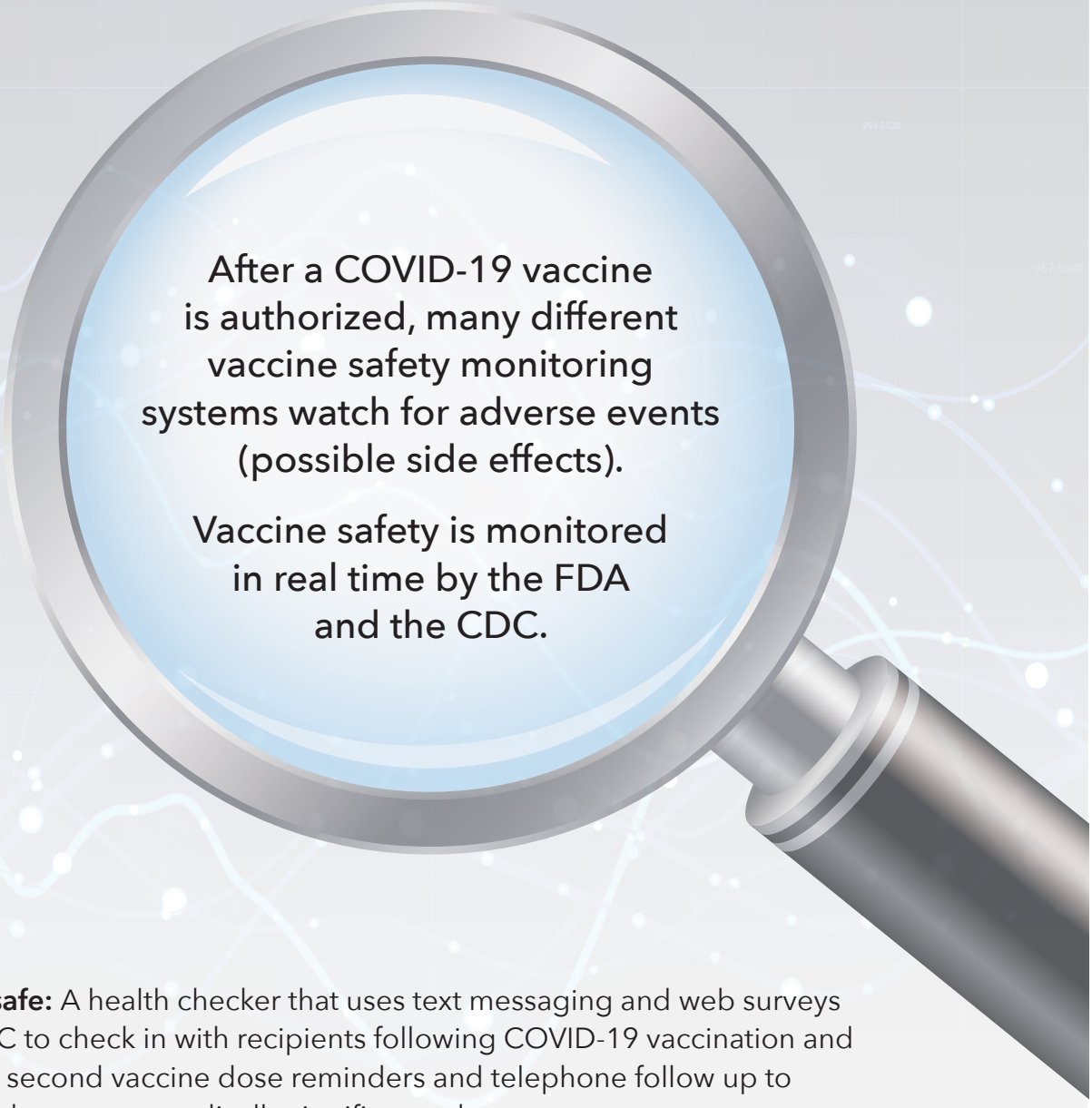
Diversity in Clinical Trials

- Current authorized vaccines were tested in diverse populations, including communities of color.
- Clinical trials showed high levels of safety and efficacy among tens of thousands of people across all age groups, genders, races, and ethnicities including:
    - Hispanic/Latino
    - American Indian or Alaska Native
    - Black
    - White
    - Native Hawaiian or other Pacific Islander
    - Asian

Emergency Use Authorization of Vaccines

- Emergency Use Authorization (EUA) allows new medicines or vaccines that treat or prevent serious or life-threatening diseases to be made available quickly to the public during an emergency, once the best available evidence from clinical trials has been carefully reviewed.
- Safety testing and clinical trials were not fast tracked. The Food and Drug Administration (FDA) and Centers for Disease Control (CDC) focused on review and authorization, making the vaccine their number one priority.

Safety Monitoring



- **CDC: V-safe:** A health checker that uses text messaging and web surveys from CDC to check in with recipients following COVID-19 vaccination and provides second vaccine dose reminders and telephone follow up to anyone who reports medically significant adverse events.
- **CDC and FDA: Vaccine Adverse Event Reporting System (VAERS)** A national vaccine safety surveillance system that collects, monitors, and tracks reports from healthcare professionals, vaccine manufacturers, and the public on adverse events that happen after vaccination.
- Other monitoring systems include the **National Healthcare Safety Network (NHSN), the Food and Drug Administration (FDA), and CDC Vaccine Safety Datalink (VSD).**

COVID-19 Variants

- Viruses can change through mutations. These mutated forms of a virus are called variants.
- Multiple variants of the virus that causes COVID-19 are circulating globally. The new variants may make the virus easier to spread, and may cause worse infections.
- **The best way to prevent more variants from spreading is to get vaccinated and follow the recommended safe practices.** Preventing infections prevents the virus from being able to mutate and spread.
- **Current COVID-19 vaccines from Moderna, Pfizer BioNTech, and Janssen still offer protection against variants.**

For more information refer to: www.cdc.gov/coronavirus/2019-ncov/more/science-and-research/scientific-brief-emerging-variants.html

Section 3

Safety Tips and Resources

Common Short Term Side Effects

- Common short term side effects are normal after vaccination and mean your body is in the process of building protection. So far, millions of people have been vaccinated and major side effects are extremely rare.

Experiencing side effects after you get vaccinated is common and does not mean you are infected with COVID-19 from the vaccine.

Some people experience short term side effects and some people don't. Either way, you're body is working to build protection.

- Speak with your doctor if you have a history of allergic reactions or have further questions about side effects.

On the arm where you got the vaccine

- Pain
- Swelling

Throughout the rest of your body

- Fever
- Tiredness
- Chills
- Headache

Johnson & Johnson (Janssen) COVID-19 Vaccine

Reports of adverse events following the use of Janssen vaccine suggest an increased risk of a rare adverse event called thrombosis with thrombocytopenia syndrome (TTS).

People, specifically women younger than 50 years old, should be aware of the rare but increased risk of this adverse event and that there are other COVID-19 vaccine options available for which this risk has not been seen.

Continue to Be Safe Before and After Vaccination

- The COVID-19 vaccines are safe and effective across all age groups, races, and ethnicities. They also help prevent the spread of COVID-19 to others.
- We are still learning how long protection lasts. Studies show that protection from COVID-19 lasts at least 6 months after being fully vaccinated. Strength of protection generated by the vaccine may decrease over time, but long-term memory cells (e.g. memory T and B cells) might retain information about the coronavirus for years or even decades.
- Fully vaccinated individuals should still continue to take precautions when in certain settings or during certain activities that could be at high risk for transmission.
    - Read more here: cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html
- **Your actions matter.** Simple strategies, like **wearing a face covering, maintaining physical distance from others, keeping hands clean,** and **staying home if sick**, will help slow the spread of COVID-19.

Keeping Safe and Protecting Yourself and Others from COVID19

Layer each measure on!
The more you add to your pile of prevention, the lower your risk of COVID19 infection

Stay Home If You Can	Wear a Mask	Stay Distant	Avoid 3'Cs:	Open Windows	Clean Hands and High Touched Surfaces
Limit contact and activities with non-household contacts Avoid close contact with people who are sick	Select a high-quality mask with multi-layers, a good fit, and filtration Wear a mask in indoor and outdoor settings when around other people Wear a mask correctly (over your nose and mouth) and consistently	Stay at least 6 feet from non-household contacts but the more distance the better. Limit duration and time spent when around others	Avoid crowded places, close contact settings, confined, enclosed spaces	Increase ventilation and airflow by opening windows and doors if possible	Clean hands often and especially after touching any high touch surfaces, contaminated items, after being in a public space and before touching your face Clean and disinfect high touch surfaces daily or more if contaminated

Stay Informed	Get Tested Periodically	Get Vaccinated When Eligible	Monitor Your Health	Practice Respiratory Etiquette
Stay up-to-date on local COVID19 news including rate of community transmission, and public health announcements If you get a call from a contact tracer or public health department, pick up the phone See your local health department website among other credible sources of information	If you engage in activity requiring in-person contact outside your home or live or work in a congregate setting, you should get tested at least once a month (regardless of exposure or symptoms) There are several types of COVID19 tests, some more reliable than others. Talk to your health care provider about which type of test is best for you based on reason for testing	Get the COVID19 vaccine when eligible and if you meet the criteria for vaccination Ensure you follow vaccination schedule (2 dose) depending on vaccine received for full protection	Be alert for symptoms of COVID19 or any new or concerning symptoms especially if you engage in activities or settings with other people	Always practice respiratory etiquette, cover your coughs and sneezes and wash or sanitizer your hands

www.belfercenter.org/publication/keeping-safe-and-protecting-yourself-and-others-covid19

Trusted Sources for Information

Learning about COVID-19 vaccines can be overwhelming.

It is important to use scientific sources to check the facts about vaccines in order to avoid false or misleading information.

A few trusted sources you can use are:

- **NYC Health + Hospitals**
  nychealthandhospitals.org/covidvaccine
  ess.nychhc.org/vaccinationinformation.html
- **NYC Department of Health and Mental Hygiene**
  nyc.gov/covidvaccine
- **New York State Department of Health**
  covid19vaccine.health.ny.gov
- **CDC**
  cdc.gov/covidvaccine
- **FDA**
  fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-vaccines

Messages From Trusted Voices

"Just like wearing a mask, I'd never advise you to do something that I wasn't willing to do myself. You should still get the vaccine even if you already got COVID before/ have COVID antibodies.

This is because we don't know how long natural immunity lasts (some studies suggest people may get it twice) and the vaccine can not only extend your immunity, but also make your immunity stronger."

– Alexandria Ocasio-Cortez
US Representative – New York

"COVID-19 is disproportionately impacting Black Americans, and generational trauma has led to massive distrust of vaccines.

The [COVID Collaborative] national education campaign will be a critical step in providing Black communities with the information they need to rebuild trust and get vaccinated."

– Derrick Johnson
President of the NAACP

"I understand you know historically – everything dating back all the way to the Tuskegee experiments and so forth – why the African American community, would have some skepticism. But the fact of the matter is, is that vaccines are why we don't have polio anymore. And they're the reason why we don't have a whole bunch of kids dying from measles and smallpox and diseases that used to decimate entire populations and communities.

If Anthony Fauci tells me this vaccine is safe, and can vaccinate, you know, immunize you from getting COVID, absolutely I'm going to take it."

– Former President Barack Obama

"We know that our collective role in helping to create a vaccine that works for black people – and that we trust – has an impact on our very survival."

– America's Black doctors and nurses & the Black Coalition against COVID-19

NYC Health + Hospitals Voices

"I got the COVID vaccine to protect myself, my family, my patients, and my community. The sooner we can all get vaccinated, the sooner we can all together return to normal life!"

– Celine Gounder, MD
Former member of the Biden-Harris Transition COVID-19 Advisory Board

"As a Pediatrician and Director of Equity, Quality & Safety at NYC H+H, I believe strongly that vaccines are safe, effective and are the most promising path forward to regaining our humanity and putting this devastating pandemic behind us forever. The medical evidence shows that the approved COVID vaccines are safe and work well in all people, something that can truly unite us in the fight against this virus. Therefore, we all have to do our part to get vaccinated to protect ourselves, our families, and our communities so we can all emerge on the other side of this stronger together!"

– Louis H. Hart III, MD
Director of Equity, Quality & Safety

"New York City has gotten through this pandemic by standing in solidarity with mask wearing, social distancing, and testing – getting your vaccine is the final step in keeping your family, community, and city safe."

Theodore Long, MD, MHS
Senior Vice President, Ambulatory Care and Population Health

"The COVID vaccine is one powerful tool that we have to protect ourselves and each other from COVID. The reality of vaccine acceptance among the community is complex. The responsibility of making the experience safe and trusting are responsibilities that we share as a community."

Khoi Luong, MD
Post-Acute Chief Medical Officer

حمي نفسك عائلتك
وأحبابك، تلقح ضد الكورونا، الوقاية خيرمن العلاج

– Rabea Khedimi, MD
Infectious Disease Physician

"As nurses, we all understand the critical importance of preventative medicine, and today, we have one of the most important tools available to us to help prevent the continuing spread of COVID-19: a safe and effective vaccine. Getting the COVID-19 vaccine yourself, and encouraging others to get vaccinated, is the best way to protect yourself and the people around you. Stopping a pandemic requires using every available resource…so we are all able to connect face to face again."

– Natalia Cineas, DNP, RN, NEA-BC
Chief Nurse Executive

我已经接受COVID疫苗的两次注射。我在此希望大家为了自己家人，身边亲朋好友及社区人群的健康，积极参与接种疫苗的活动。

– Christopher Ding, MD
Emergency Medicine Resident

"Me vacune para proteger a mi familia, amigos, y pacientes. La vacuna es segura, y nos ayudara volver a la normalidad."

Leonel Lopez III, MD, MHS
Director, Equity and Evaluation, Office of Ambulatory Care and Population Health

کوویڈ 19 ویکسین ہمارے جسم کو بیماری سے لڑنے میں مدد دیتی ہے
اور ہمیں کوویڈ 19 وائرس سے محفوظ رکھتی ہے

Syra Madad, DHSc, MSc
Senior Director, System-wide Special Pathogens Program

"I can understand the concerns about a new vaccine, but when you look at what we know about COVID – how devastating an illness it is, the deaths and the long-term consequences that we are still learning about, and you compare that to the science of the vaccine and how well they work at preventing severe sickness and death from COVID, for me it was a clear choice. I am vaccinated, and I feel a bit more at ease knowing that many of my family members are also vaccinated."

– Nichola Davis, MD, MS
Vice President and Chief Population Health Officer, Office of Population Health

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