

# What doctors wish patients knew about family immunizations

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Immunizations, or vaccinations, have prevented countless cases of disease and disability, and they save millions of lives each year. Yet there are still people who are sickened or disabled by preventable infectious diseases and families that mourn the devastating loss of loved ones from vaccine-preventable illnesses. That is why it is important to stay up to date on immunizations for the entire family.

Vaccination of children born between 1994 and 2018, according to the Centers for Disease Control and Prevention (CDC), will prevent 419 million illnesses and 26.8 million hospitalizations. Vaccines will also help avoid 936,000 deaths and save nearly \$1.9 trillion in total societal costs, which includes \$406 billion in direct costs—that's more than \$5,000 for each American.

The AMA's What Doctors Wish Patients Knew™ series provides physicians with a platform to share what they want patients to understand about today's health care headlines.

In this installment, AMA member Nancy Crum, MD, an infectious disease physician at Avita Health System in Galion, Ohio, discusses what patients need to know about immunizations for the entire family. Dr. Crum is also an alternate delegate in the AMA House of Delegates for the Infectious Diseases Society of America.

### Over 25 pathogens have vaccines

“There's a certain number of pathogens—which is 29 and counting—for which we have vaccines that can prevent infections, and having these vaccines available has dramatically changed which diseases threaten the health of our patients,” said Dr. Crum. While “there's over 25 vaccines that have been developed, they're not necessarily all recommended for each person or all ages. Rather, guidelines from the CDC's Advisory Committee on Immunization Practices, or ACIP, are published each year as to which vaccines are needed for which groups.”

“For instance, there's now a dengue vaccine—and that wouldn't be a vaccine that people in the United States would get,” she added. But “if, for example, you live in Puerto Rico where there's a lot of dengue fever cases, then it would be a vaccine to consider.”

“Not everybody needs all 29 vaccines, but that is a general range of how many different pathogens we have a vaccine against,” Dr. Crum said. “What is exciting is that there are a large number of infections that we can prevent through vaccinations. Further, the number of pathogens for which a vaccine is available is rapidly expanding.

“Vaccines have now been developed and approved against dengue, malaria, COVID-19, cholera and so forth,” she added. “There are also ongoing efforts to develop newer vaccines against pathogens such as pneumococcus—PCV 15 and PCV 20—as well as pathogens that never before had a vaccine available. Future vaccines are expected against respiratory syncytial virus, herpes and a whole host of infectious pathogens.”

## Vaccinations keep people healthy

“The importance of vaccination is to try to keep people healthy and prevent infections,” said Dr. Crum. “Obviously there's a narrow range of bacterial and viruses that we do have immunizations for.

“But for those pathogens, taking a vaccine for prevention is a huge advancement and saves millions of lives each year,” she added. Looking “back at the early 20th century, we were dealing with smallpox, diphtheria, polio, measles, and mumps, and all of those were in the millions of cases every year.”

“Now we can count these diseases as very small numbers and most of these previously deadly diseases have largely gone away,” said Dr. Crum. “If we keep our vaccine rates high for these pathogens, it's a huge advancement in medicine. It's a way to prevent some of our worst infectious disease problems, particularly among children.”

## Vaccines drive disease rates down

With measles, mumps and rubella (MMR), “we really weren't seeing those conditions in the United States or in the developed world for a long time,” said Dr. Crum. “However, if MMR vaccine rates decline below the herd immunity threshold, then we unfortunately see measles outbreaks even at places like Disneyland, colleges and close-knit communities.”

Similarly, New York recently reported the first case of polio in the U.S. in nearly a decade, which “just proves that the pathogens are still around and we're just containing them by vaccination, but we need

to keep them [vaccination rates] high to do so,” she added.

## It’s about herd immunity

“Measles requires a 95% herd immunity. So, if our measles vaccination rates are not kept high, then we will see it again,” said Dr. Crum. “Some people say: Well, my vaccination status is not going to matter in the grand scheme of things in a community.”

“But it absolutely does because if you need to have 95% of your population protected to prevent measles from coming in and starting cases, then that requires every single person to go out there and get vaccinated because we have a small percentage of that population who cannot get vaccinated,” she said. “For instance, for MMR, it’s a live vaccine, so people who are immunosuppressed or pregnant cannot safely get vaccinated.”

“So, if 5% of your population are immunosuppressed or pregnant and they can’t get it, that means the rest of us, not only for our own health but the health of our communities, would really need to go out and get vaccinated,” said Dr. Crum. “The same is also true for other vaccines as well, beyond MMR.”

## There are two categories of vaccines

“One way to categorize vaccines is inactivated vaccines, which means there are no live components—there’s no possible way that that vaccine could cause that particular disease,” said Dr. Crum. “For instance, the COVID-19 vaccines all have protein components of SARS-CoV-2, but none of them have any live components, so you couldn’t really ever get the disease of COVID-19 from the vaccine.”

The second category is live vaccines, which “have part of the pathogen within the vaccine that is live, so there is a very small risk that if you got vaccinated you could actually get that disease,” she said. “But that really isn’t an issue if you have a normal immune system. People with a normal immune system can get both inactivated and live vaccines, but live vaccines are contraindicated if you have significant immune suppression.”

For example, “people with HIV with CD4 counts less than 200 and not on antiretrovirals should not get a live vaccine. People on chemotherapy or who just got a transplant cannot get a live vaccine,” Dr. Crum said. “Pregnant women also should not get a live vaccine. But again, that’s a small percentage of our population.”

“Most of our population can get all vaccines unless they’ve had a significant allergy in the past to the vaccines or one of its components,” she said.

## Expect some side effects

The most common side effect or adverse event “to vaccines is a sore arm for a couple days. Rarely are there any other significant side effects,” said Dr. Crum. “If you compare that to actually having the disease itself, it’s a much lower risk of having a significant adverse outcome. One is a small inconvenience of feeling a bit of pain in your arm and the other is a much more significant risk to take of getting the infection and all of its possible complications.”

Other side effects include “fatigue, headache, low-grade fever, local reactions at the injection site and there is always a possibility of an allergic reaction,” she said. “Any medication, any vaccine always has that potential risk.”

Additionally, “sometimes there are unusual side effects like Guillain-Barré syndrome, myocarditis and so forth, but those are very uncommon on a populational level,” Dr. Crum said. “If you look at the chance of getting things like Guillain-Barré syndrome, myocarditis or any of those things from the vaccines, the risk is much lower than if you would develop the infection itself because many of these same infections—such as influenza—actually can cause Guillain-Barré syndrome and myocarditis.”

## No vaccine is 100% effective

“There are really no vaccines that are 100% effective, but there are some vaccines that are more protective than others,” said Dr. Crum. “For instance, the measles vaccine is extremely protective and typically offers lifelong protection.”

“On the other hand, the flu vaccine is less effective. For example, for the H3N2 strain this last year the vaccine produced was only 35% effective,” she said. “While vaccines have different efficacies, they’re still very important to get because even if someone still develops the infection, a few different things happen. One is the severity is a lot less. And the other thing is that a lot of these vaccines offer some level of population protection,” Dr. Crum said. “For example, conjugate vaccines reduce not only infection but also colonization, so it would decrease your transmitting it to our more susceptible people like babies and immunosuppressed persons.”

## Vaccinations target specific groups

“Vaccines are made for different stages of life mainly because the immunocompetency of that host is different,” said Dr. Crum. For example, “babies are very susceptible and elderly people are very much more susceptible and have worse outcomes if they get infections.”

“Vaccines are also targeted to what you're exposed to. If you're in college and you're a young adult, you might need a vaccine because you're going to be exposed to certain things in your particular setting, such as meningococcus vaccinations,” she said. “So, vaccinations are really meant to target specific groups and what they need the most in terms of what they are susceptible to and how to protect them.”

## Know which vaccines to get

“Every year of the life of a person once they hit six months should get a flu shot every year, unless they have a severe allergy to flu shots that can't be overcome,” said Dr. Crum. “So, for influenza, it's easy to remember that almost everyone should be encouraged to be vaccinated.”

“Hepatitis B is a vaccine that all babies now get when they're born. But there is new hepatitis B vaccine guidance now available for adults since some were not vaccinated in childhood,” she explained. “If someone has not been vaccinated against hep B, they should go back and do it if they are under 60 years of age. And if they're older than 60 and have particular risk factors for hepatitis B, they should also get the vaccine.”

“Human papillomavirus, or HPV, is now a vaccine that's recommended for everybody generally starting around 11 or 12 years old through 26 years old to prevent HPV infections,” said Dr. Crum. “If someone is older—up to 45 years old—and has risk for HPV, we should consider vaccinating them as well.”

“One of the cool things is that we have two vaccines that are now against cancer. The HPV vaccine prevents cervical cancer and anal cancer and probably head and neck cancer as well—those studies are just coming out,” she said. “We also have the hepatitis B vaccine. Hepatitis B is a leading cause of liver cancer in the world. So not only do we have these two vaccines that prevent specific infections, but they also can prevent the development of cancer later in one's life.”

Additionally, “most people are exposed in childhood to varicella that causes chickenpox and then later in life it can come back as shingles, which can be a very disabling, painful disease,” she said. “Now we have a shingles vaccine that's a two-dose series recommended for adults 50 years or older. There is also new ACIP guidance for shingles vaccination among those 19–49 years old who are immunosuppressed and at high risk for varicella-zoster virus reactivation.”

## If you're behind, start where you left off

“Vaccines don’t need to be repeated, even if there’s a significant time between them. Generally, you just pick up where you’ve left off—I typically tell patients to just reengage with your physician and start getting the vaccines again,” said Dr. Crum. “Of course, we want to keep them on schedule because there’s a reason for the schedule. For example, to protect a child from the very beginning of life as soon as vaccines can be given and to provide protection for an individual as soon as possible.”

“We want people to keep up to date and get them on time, but if you’ve gotten behind just start where you left off,” she said. “It’s the same for adults. I tell my 68-year-old patient, you’re due for your pneumococcal vaccine and yes it was due at age 65, but it’s OK, we’re going to get you protected by giving it to you today.”

## Check with your doctor if traveling

“There are a lot of vaccines that are important globally, and if you are traveling you should check to see what other vaccines you might need,” said Dr. Crum.

“If you look at the CDC website of what age you should get what vaccines, those are pertinent to people living in the United States in our environment here. But one of the things that is often overlooked is that when people travel overseas, they don’t recognize that they’re going into an area that has different pathogens that they’re going to be exposed to,” she added, noting “there could be outbreaks of certain diseases going on there.”

“One of the most exciting things about vaccinology right now is the development of vaccines against pathogens in developing countries such as Ebola, dengue, malaria, cholera and tick-borne encephalitis,” Dr. Crum said. “And while not all travelers need these vaccines, there are some that can benefit, depending on their travel location, plan for residency in that area, and potential exposures that they may face.”

“So, just as a reminder to inquire if there are any vaccines that in addition to your routine vaccines would be helpful for you when you move or when you travel to different areas of the world to maintain your health and well-being,” she said.