

What doctors want patients to know about family immunizations

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Immunizations 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.

About 4 million deaths worldwide are prevented by childhood vaccination every year, [according to the Centers for Disease Control and Prevention](#) (CDC). Meanwhile, more than 50 million deaths can be prevented through immunization between 2021 and 2030. In fact, by 2030, measles vaccination can save nearly 19 million lives while hepatitis B vaccination can save 14 million lives.

The AMA's What Doctors Want Patients to Know™ series gives physicians a platform to share what they want patients to understand about today's health care headlines and how to take charge of their health through preventive care.

In this installment, two physicians took time to discuss what patients need to know about immunizations for the entire family. These AMA members are:

- [Nancy Crum, MD](#), an infectious disease physician in Galion, Ohio, and an alternate delegate in the [AMA House of Delegates](#) for the Infectious Diseases Society of America.
- Swathi Mannava Gowtham, MD, a pediatric infectious diseases physician at Geisinger in Mechanicsville, Pennsylvania.

[Geisinger](#) is a member of the [AMA Health System Program](#), which provides enterprise solutions to equip leadership, physicians and care teams with resources to help drive the future of medicine.

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 ... are published each year as to which vaccines are recommended for which groups,” she added. “Vaccines have now been developed and approved against dengue, malaria, COVID-19, cholera and so forth.”

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 bacteria 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.”

Vaccines “are all strategies to train your body on how to fight the viruses or bacteria before you see the infection,” Dr. Gowtham said. “When you have some protection, you’re not

going to have as severe of an infection and that would decrease hospitalizations and deaths from these illnesses.”

Kids should stick to vaccine schedule

“Children should be getting all the [vaccines recommended by the American Academy of Pediatrics](#),” said Dr. Gowtham, noting the schedule for vaccination is important because “as an infectious disease specialist, I still see vaccine-preventable illnesses.

“For example, I just had a patient who has a very bad bacterial meningitis infection after an influenza infection. Influenza played a role in helping viruses and bacteria play off of each other—helping create a pathway for bacteria to give a brain infection,” she added. “People often say that it is just flu and it’s not the case there. There are definitely complications, and you don’t know which child it’s going to be.”

“This is a previously healthy child who had all his other vaccines, but tragically delayed getting the flu vaccine,” Dr. Gowtham said. “Vaccines have been studied in this young population—children under 6 months—for tetanus, diphtheria, pertussis, [hepatitis B](#), pneumonia and others ... to prevent severe infections, brain infections, lung infections, blood infections in these babies, so it’s very important.”

The earliest vaccine given “is at birth and it’s the hepatitis B vaccine,” she said, noting that the AAP continues to recommend giving newborns a dose of hepatitis B vaccine within 24 hours of birth with additional doses at 1–2 months and 6–18 months.”

“Then there are series of vaccines that happen at 2 months, 4 months, 6 months, 1 year and so on,” Dr. Gowtham added.

Some may need extra vaccinations

“There are vaccines that are recommended for healthy people—healthy children, healthy infants, healthy adults,” Dr. Gowtham said. And “there are some extra vaccinations that we also recommend to people who are particularly at high risk for certain infections such as the meningitis and pneumonia vaccines.”

This includes “children with cochlear implants, people who don’t have spleens—they’re higher risk for certain types of bacteria, so they get extra vaccinations,” she said. Additionally, “your childhood vaccines are there to protect infants under the age of 1 because they are at the highest risk of dying from infections because their immune systems are weak and immature.”

It’s a strong public health measure

“One of the triumphs of 20th century medicine is that vaccines have significantly reduced infant and childhood mortality, along with other public health measures, and immunization is one of the strongest public health measures we have,” Dr. Gowtham said. Because of vaccines, “I have not seen as many cases of meningitis, for example.”

“My mentors used to see bacterial meningitis in children every couple of months—this was before the Hib [*Haemophiles influenzae* type b] vaccine. And when I was training, I would see a couple cases every year,” she said. “Now I see one every couple of years because the vaccine has significantly reduced the incidence.”

“My worry is that when we have pockets of nonvaccination or undervaccination we’re going to see a rise in cases in which each incidence, each complication was preventable. And that to me is tragic,” Dr. Gowtham said.

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—now known as community immunity threshold](#)—of 92–95%, “then we unfortunately see measles outbreaks even at places like Disneyland, colleges and close-knit communities.”

Similarly, New York reported the first case of polio in the U.S. in nearly a decade in 2022, which “just proves that the pathogens are still around and we’re just containing them by vaccination, but we need to keep [vaccination rates] high to do so,” she added.

It's about herd immunity

"The herd immunity term gets thrown around a lot and [herd immunity](#) has a lot of different factors," Dr. Gowtham said. "So, what does herd immunity mean? It means that for a bug to spread like wildfire in a population, you need people who are vulnerable to infection—people who don't have any prior immunity—and [infections] can spread from person to person to person to person."

"And that depends on a couple things. One is the R-naught, and that means how many vulnerable people one person can infect," she added. "For influenza it's around [one to two](#). When COVID-19 first started, the R-naught was thought to be around two to three."

For chickenpox, it's around 10 to 12 and for "measles it's 15 to 18," Dr. Gowtham said, emphasizing that "one person can infect 15 to 18 people with measles because it's one of the most infectious viruses and you need 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 ... 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.

“With live vaccines, what we have with measles, mumps, rubella, varicella is viruses that are attenuated, meaning weakened,” said Dr. Gowtham. “In the laboratory, these strains are not transmissible, but 7% to 9% of children with the measles vaccine can have a measles-like rash, even though it’s not contagious or anything.

“It can give you a fever and stuff like that because the body’s learning to fight against the bacteria or virus and it can provide you long-term protection,” she added, noting that “the live vaccines we generally tend to give after 1 year of age because moms pass on their immunity to their babies, so the antibodies through breast milk and through birth are passed on to their babies.”

“People with a normal immune system can get both inactivated and live vaccines, but live vaccines are contraindicated if you have significant immune suppression,” said Dr. Crum. 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.

“Pregnant women also should not get a live vaccine. But again, that’s a small percentage of our population,” she added.

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 the possibility of an allergic reaction, which is uncommon, she said. However, “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.

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.”

“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,” she said. “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”.

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 and [older adults](#) “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” for people in close quarters, like college or military dormitories, 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.

“Hepatitis B is a vaccine that all babies get when they're born. But there is also hepatitis B vaccine guidance available for adults since some were not vaccinated in childhood.”

“The hepatitis B vaccine is very important because there's no cure for hepatitis B,” Dr. Gowtham said, noting that a chronic carrier risks “liver issues, scarring of the liver and liver cancer later on in life.”

“[Human papillomavirus](#), or HPV, is 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 against cancer,” she said, noting that the HPV vaccine prevents [cervical cancer](#) and anal cancer while the hepatitis B vaccine prevents liver cancer caused by the virus.

Additionally, children today should be vaccinated against varicella virus, the cause of chicken pox. A recent study found that risk of shingles has [dropped 72%](#) in children who get the vaccine.

People who “are exposed in childhood to varicella ... then later in life [it can come back as shingles](#), which can be a very disabling, painful disease,” Dr. Crum said. “Now we have a shingles vaccine that's a two-dose series recommended for adults 50 years or older.”

There are also recommendations “for shingles vaccination among those 19–49 years old who are immunosuppressed and at high risk for varicella-zoster virus reactivation,” she said.

If you're behind, start where you left off

"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. "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."

"It's the same for adults," she added. "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. "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."

An exciting thing "about vaccinology right now is the development of vaccines against pathogens in developing countries such as Ebola, dengue, malaria, cholera and tick-borne encephalitis," she said. "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."

Talk with your physician

"What I always tell parents of children who I speak to is that my job as a pediatrician is to make you comfortable with the decisions that you make for your child," Dr. Gowtham said. "You are the one who gets to make the decision, but my job is to address your fears and to address your real concerns."

"As physicians, sometimes we're not as good at communicating the science about vaccine safety and why we do certain things that we do," she said. But "vaccines are a good thing. We need to build the public confidence around vaccination."