Two Doses of the HPV Vaccine Is All You Need

Long-term immunity from human papillomavirus infections — and the deadly cancers they can drive — reached with just two jabs.

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A study led by Fred Hutch Cancer Center cancer biologist Denise Galloway, PhD, that looked at the staying power of the HPV vaccine has found that two doses provide the same amount of immune protection as three, with no additional boosters needed.

“We looked at long-term immunity, or immunogenicity — the ability to trigger an immune response — using two separate studies with kids who were vaccinated at 10 to 12 years old and then a subset that were invited back either three or almost 10 years later,” said Galloway, whose research decades ago was instrumental in linking human papillomavirus, or HPV, infections to several cancers and in designing trials for the HPV vaccine.

“We looked for memory B cells as a marker that you had a vaccine and your immune system remembers it,” she said. “The answer was yes, and it was the same for either three or two doses.”

The study, recently published in Vaccine, found that “robust immune responses were observed and did not differ significantly among subjects vaccinated with two or three doses.”

What does this mean for the future? Galloway said it’s the first step to simplifying HPV-related cancer prevention even more.

“Two doses is the standard now in kids under 15 in the U.S.,” she said. “Now we’re interested in getting it down to one dose.”

Study’s global significance is huge

Developing a single-dose HPV vaccine will have a large impact globally, said Galloway, who serves as the scientific director of Fred Hutch’s Pathogen-Associated Malignancies Integrated Research Center and holds the Paul Stephanus Memorial Endowed Chair.

“It’s going to make a big difference in the developing world where you’re lucky to get one dose,” she said. “Globally, it’s very hard to follow people and it’s expensive to have more than one dose.

That's where it will have the biggest effect."

But in the U.S., it will also go far to help to protect people against HPV infections.

HPV infections, transmitted through skin-to-skin contact, are more or less ubiquitous among adults across the globe. Most HPV infections clear up on their own, but can morph into precancers that ultimately cause cervical, anal, vulvar, penile and head and neck cancers.

"A single dose will make it easier here in the U.S.," Galloway said. "You won't have to think about when you come back for the next dose. Just do it once and get it over with."

First approved by the FDA in 2006, the HPV vaccine has been administered to millions of young women and men around the world.

In Scotland, where the vaccine is provided free to school children, cervical cancer rates have plummeted. Australia, too, has a highly successful HPV vaccination program and according to the newsletter HPV World, is on track to completely eradicate cervical cancer.

"The U.S. saves about $8 billion a year by preventing these cancers," Galloway said. "Although not everybody is getting the vaccine. The International Papillomavirus Society thinks that we can eliminate cervical cancer in this country with the vaccine and screening, which would be very cool."

The HPV vaccine prevents new infections and is most effective when given to children before they're sexually active.

Screening and valid information still key

But even after receiving the HPV vaccination, people should continue to be screened, Galloway said.

"One of the good things is these cancers move slowly, so if you're screened regularly, you should catch it," she said. "Although some people don't go in for screening, or they can't afford to go."

Every year, around 11,500 new cases of cervical cancer are diagnosed in the U.S. and about 4,000 women die of the disease. Almost all of these cases are driven by an HPV infection, which has no symptoms.

When caught and treated early, cervical cancer is highly survivable and death rates for the disease have dropped by more than half since the mid-1970s. According to the American Cancer Society, this is a direct result of prevention and screening (usually via pap smear or HPV test). Research shows that in states with expanded Medicaid programs, more people get cervical cancer screenings. Cervical cancer death rates for Black and Native American women are still about 65% higher than they are for white women.

The HPV vaccine has gone through "more than 160 studies that show [they] have a favorable safety profile — the body of scientific evidence overwhelmingly supports their safety," per the Center for Disease Control and Prevention, or CDC.

Still, misinformation surrounding HPV vaccination has been rampant — and profitable, per a 2024 study of Instagram influencers done by the University of Washington. One study that dug into comments about HPV vaccination on social media found misinformation regarding "adverse reactions, unnecessary vaccines, conspiracy theories, and mistrust of authority," with Facebook publishing the highest proportion of misinformation in its comments.

One and done?

Now that Galloway and her team have determined that two or three jabs guarantees the immune system will remember the virus for at least 10 years, she said she wants to study the long-term immunity, or immunogenicity, of just one dose.

"Millions of women have taken the vaccine, and these cancers are being prevented," she said. "If you look at the rates of cervical cancer lesions in young women who've been vaccinated, they've gone down a lot."

More than 200 distinct types make up the HPV virus family with HPV 16 and HPV 18 causing about 70% of cervical cancers as well as a higher percentage of both head and neck and anal cancers.

Current HPV vaccines pack a punch, protecting against these detrimental types and others, along with genital warts. But as with all discoveries, Galloway believes there's always room for improvement.

"I'm excited to see if one dose will really hold up over the long run," she said.

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SIDEBAR

HPV Vaccine Information and Resources

- Currently, the CDC recommends HPV vaccines for children at around age 11 or 12, although kids as young as age 9 can be vaccinated.

- Additionally, adults up to age 26 can be vaccinated if they haven't received one previously.

Most health insurance covers the cost of the vaccine.

- You can get HPV vaccines at the doctor’s office, at pharmacies, state health departments, community health clinics and at some schools. The Washington State Childhood Vaccine Program provides the HPV vaccine at no cost to adolescents less than 19 years of age.

- Cervical, breast and colorectal cancer screenings are free for eligible Washington state residents through the Breast, Cervical and Colon Health Program.

March 4 is HPV Awareness Day

Learn more about HPV prevention at AskAboutHPV.org

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