PARENTS PACK

MONTHLY UPDATES ABOUT VACCINES ACROSS THE LIFESPAN

FEATURE ARTICLE — IS MODERNA MAKING ANOTHER BIVALENT COVID-19 VACCINE? May 2025

The short answer to this question is no, but confusion stemming from the April Advisory Committee on Immunization Practices (ACIP) meeting for the Centers for Disease Control and Prevention (CDC) left some concerned about an impending return to bivalent COVID-19 vaccines. Let's take a look.

The history

COVID-19 entered our collective conscious between January and March 2020. The World Health Organization (WHO) declared a pandemic, which is a global epidemic, on March 11, 2020. Chances are you remember the months that followed (even if you don't want to) as we all tried to adapt to something we had never experienced before. Relief came in the form of mRNA vaccines, approved in December 2020, followed by adenovirus vector vaccines and eventually protein-based vaccines.

The confluence of three factors contributed to this success:

1. The U.S. federal government's "Operation Warp Speed," which poured resources into a group of companies whose vaccine candidates seemed the most promising. This effort removed the risk for the companies because even if their vaccine was not the first or best vaccine, the government had agreed to pay for it.
2. An unmatched global scientific collaboration that ensured timely and open information sharing among scientists from around the world.
3. Decades of previous groundwork developing mRNA technology, including at the University of Pennsylvania and the National Institutes of Health (NIH). Without this historical work, mRNA vaccines would not have been available in the shortened timeframe. It is precisely because of the years spent working head down in the lab to understand and develop the promise of mRNA technology that Drs. Drew Weissman and Katalin Karikó shared the 2023 Nobel Prize in Physiology or Medicine.

Despite the availability of vaccines, infections continued. SARS-CoV-2, the virus that causes COVID-19, has accumulated changes since bursting onto the scene in 2020, leaving a progression of discarded monikers in its wake: alpha, beta, gamma, delta, omicron. With the emergence of omicron in late 2021, enough changes had accumulated that the vaccines based on the original strain of the virus, called the Wuhan strain, were less effective. To address this, bivalent booster vaccines were approved in August 2022. These vaccines contained either mRNA (Pfizer and Moderna) or the spike protein (Novavax) for two SARS-CoV-2 variants: the original Wuhan strain and an Omicron subvariant circulating at the time, called BA.4/BA.5. Unfortunately, the bivalent vaccines did not provide significant additional protection. As a result, in June 2023 the FDA determined that COVID-19 vaccines should be updated to reflect currently circulating variants, but they should be monovalent, dropping the original Wuhan strain. Both the 2023-2024 and 2024-2025 COVID-19 vaccines contained mRNA or spike protein for a single variant of the virus.

The confusion

Fast forward to the April 2025 ACIP meeting during which Moderna presented data on an updated mRNA-based COVID-19 vaccine, which they referred to as mRNA-1283. (Their original vaccine is known as Spikevax.) The mRNA-1283 candidate vaccine is not currently licensed, but if a company has good data to demonstrate that a candidate vaccine is safe and it works, they present the information to the ACIP. That way, if the vaccine is eventually licensed by the FDA, the members of the ACIP are not hearing about it for the first time when they are being asked to make vaccine recommendations. This approach also offers opportunities for members of the ACIP to ask questions of the manufacturer and enables the manufacturer to anticipate any concerns or vacuums of information that they may need to address before the vaccine would be recommended.

Two aspects of Moderna's presentation could have caused confusion about bivalent vaccines for observers:

1. Whereas Spikevax contains mRNA for the entire spike protein, the candidate mRNA-1283 contains mRNA for only two parts of the spike protein, called the N-terminal domain (NTD) and the receptor binding domain (RBD), shown on one of the slides as two differently colored molecules. The mRNA also includes instructions for a short flexible linker (shown on the slide as a thin dotted line connecting the two molecules) and a segment of influenza hemagglutinin protein that enables the produced protein to be more readily recognized by cells of the immune system (B cells). The benefit of using these two parts of the spike protein is that more of the immune response will be directed against the most important parts of the spike protein when it comes to immunologic protection. This means that lower doses of the new candidate vaccine were as effective as the existing Spikevax vaccine. In addition, because of the smaller amount of mRNA, the vaccine is easier to store at refrigerator temperatures.
2. Moderna has been conducting studies on this candidate mRNA-1283 vaccine since 2021. As such, some of their studies, including data presented during the April 2025 ACIP meeting, were from trials conducted during the "bivalent COVID-19 vaccine era" of 2022-2023. Because that was the type of vaccine being recommended at that time and because it could not be anticipated that we would move back to monovalent COVID-19 vaccines, the trials included bivalent versions of both mRNA-1283 and Spikevax. This does not mean that Moderna will submit a bivalent vaccine for approval, but it is also important that they showed the data in the context in which they were generated.

The bottom line

In sum, the April 2025 presentation to the ACIP demonstrated that Moderna is working to make improvements to their mRNA-based COVID-19 vaccine, but they are not aiming to return to a bivalent COVID-19 vaccine.

For links to resources in the Feature Article, please visit *bit.ly/may2025FA*.

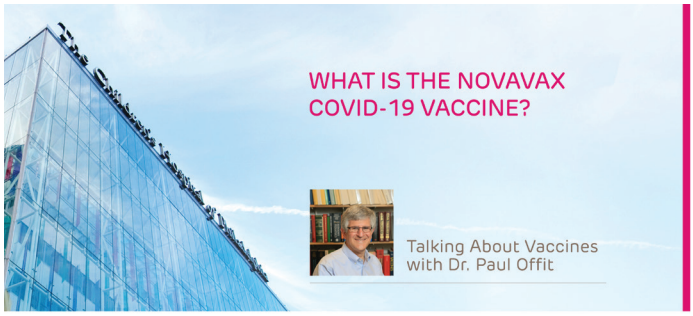
continued >

TRIVIA CORNER

Vaccines were shown to cause what disease?

A. Asthma
B. Diabetes
C. Multiple sclerosis
D. None of these

FEATURED VIDEO: WHAT IS THE NOVAVAX COVID-19 VACCINE?



Dr. Paul Offit recorded this video in June 2022 right after the Novavax COVID-19 vaccine was approved for use. He describes how this protein-based vaccine differs from the mRNA-based COVID-19 vaccines.

Watch the video, bit.ly/novavax-covid-vax.

NEWS & NOTES

Looking for info on measles?

As more states report cases of measles, more people are likely to have questions. The Vaccine Education Center (VEC) has compiled links to information about measles on the news page of our website.

Check out the info and get your questions answered.

Didn't find an answer to your question? Complete our contact form, so we can help.

Wondering about the chance of a bird flu pandemic?

Recently, Dr. Offit, VEC Director, presented a webinar for healthcare professionals to discuss bird flu and the potential for a pandemic. The recording is available for anyone interested in a deeper dive into the science. The webpage also includes files with the slides and answers to questions asked during the event. Healthcare providers can get free continuing education credits (CME, CEU, CPE) after viewing the event and completing the necessary requirements.

Find out more or listen to the webinar.

Will we have a "traditional" (protein-based) COVID-19 vaccine moving forward?

When COVID-19 vaccines were first approved during the pandemic, they were approved under a process known as emergency use authorization (EUA). The EUA process is reserved for products that are developed to respond to an emergent situation, such as a pandemic. To continue offering this vaccine now that the emergency is over, these products need to complete the traditional process, known as a biological license application or BLA.

Since the COVID-19 pandemic was declared over in May 2023, the vaccines needed to transition to BLA approval status. Both the mRNA-based COVID-19 vaccines (Pfizer and Moderna) completed this process before 2025. The protein-based COVID-19 vaccine (Novavax) was expected to be approved as a licensed vaccine in early April 2025. Officials from the Food and Drug Administration (FDA) initially missed their decision date related to Novavax and then indicated in late April that they will require a new clinical trial before they consider BLA approval of the Novavax vaccine.

This request is out of the norm, particularly since this process was in its final stages. Because clinical trials are expensive, have been completed for essentially the same product previously, and the request is in variance with how other COVID-19 vaccines were evaluated, only time will tell whether this vaccine will remain an option in the U.S.

Find out more about EUA.

February CDC vaccine meeting held in April

The Advisory Committee on Immunization Practices (ACIP) provides guidance to the Centers for Disease Control and Prevention (CDC) regarding vaccine recommendations. A previously scheduled meeting for February was held in mid-April. The ACIP heard updates related to serveral vaccines. They also heard an update on the current measles outbreaks.

U.S. The committee also voted on 1) the use of new meningococcal and chikungunya vaccines for specific groups, 2) an age change for use of RSV vaccine in adults, and 3) adding a precaution for use of an existing live, weakened chikungunya vaccine in adults 65 years and older based on several vaccine recipients requiring hospitalization shortly after receipt of the vaccine.

- To find out more about the topics, see the presentation slides or to listen to the archived event, check out the CDC's website.
- To learn more about the ACIP's processes and who is involved in making vaccine recommendations, check out this video series offered by the VEC.

The next ACIP meeting is scheduled for late June 2025.

For links to resources, please visit *bit.ly/may2025NN*.

TRIVIA ANSWER

The correct answer is D. Numerous scientific studies have shown no link between vaccines and asthma, diabetes, or multiple sclerosis.

Go to vaccine.chop.edu/trivia to play Just the Vax, the Vaccine Education Center's trivia game, where you can find this question and others like it.

Children's Hospital of Philadelphia
Vaccine Education Center

Contact us: contactPACK@chop.edu

Learn more: vaccine.chop.edu/parents

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