

# Are combined COVID-flu vaccines, or universal flu shots, really a good idea? Here's what you need to know

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Credit: Ruby Wallau/Northeastern University

Pfizer-BioNTech and Moderna are currently developing and testing various "combined" vaccines to guard against diseases such as

COVID-19, influenza and RSV (respiratory syncytial virus) in one single injection.

The combination shots are possible thanks to advances in mRNA technology, which allow the drugmakers to encode flu antigens into a vaccine cocktail that also carries coronavirus antigens, such as the one proposed by Pfizer, says Mansoor Amiji, Northeastern distinguished professor in the departments of pharmaceutical sciences and chemistry.

Separate from the two pandemic companies, a team of scientists from the University of Pennsylvania published research [last week](#) in *Science* detailing a "universal" mRNA [flu vaccine](#) that in theory would inoculate against all 20 known strains and subtypes of flu. Experimentally, the researchers say the shot produced "high levels of antibodies" for all 20 variants in mice and ferrets—a step that could soon lead to protection in humans.

"They're developing specifically an mRNA flu vaccine, which would be one vaccine that wouldn't necessarily need to change year-to-year," Amiji says of the experimental universal flu shot. "That gives us this opportunity to say, if you could create a [universal flu vaccine](#), why not create that together with the COVID booster? Both of them would be using mRNA technology."

These innovations have been long-anticipated. By reducing the frequency of injections, manufacturers could spur vaccination rates, leading to greater immunity across populations, Amiji says. That would translate to less severe disease and hospitalization—a concern that's only increased since the COVID-19 pandemic showed how easily and quickly hospitals get overwhelmed during disease outbreaks.

Interest in creating effective combinatory vaccines couldn't be higher as the U.S. heads into a "triple-demic," a winter season with higher rates of

flu, RSV and COVID-19. Such vaccines could be a panacea for low booster rates amid so much COVID fatigue and persistent vaccine hesitancy in the face of a potentially deadly winter, Amiji says.

"This way both flu and COVID vaccines will be widely disseminated because now you're only getting one injection instead of two," Amiji says.

From a business standpoint, Amiji says there may be some downsides to a single vaccine thwarting multiple diseases. One product instead of two or several could mean less revenue. But companies such as Pfizer and Moderna valuing vaccine compliance may make good business sense in the end, Amiji says.

Both Moderna and Pfizer have tailored their production timelines such that their combination vaccines, if approved, would be ready by the fall of 2023, Amiji says. Which raises the question: Will the Omicron lineage of COVID-19—of which there have been numerous mutations—still be the prevailing variant, or will the virus continue to evolve at such a rate as to outpace these vaccines?

"That's the one big question with COVID," Amiji says. "But with the flu, again relying on this universal flu mRNA vaccine, then it suddenly makes sense to have one type of flu mRNA, or a single mRNA molecule coding for these specific strains."

While a universal vaccine with full type coverage would be entirely new, the idea of giving multiple vaccines at once is, of course, not. And nor are combined vaccines. Some childhood vaccines are administered together on the same day; and there are even examples of combined vaccines already in use, says Eric Rubin, editor-in-chief of the *New England Journal of Medicine*,

"The flu vaccine contains three or four different antigens; the pneumococcal vaccine contains as many as 23 different targets. And we even have vaccines that combine antigens from very different viruses, like the MMR vaccine—measles, mumps and rubella—that's given to all children," Rubin says.

Taking into account theory and practice, Rubin says he doesn't have any particular concerns with the development of a combined COVID-flu vaccine. "There is a question, though; the flu vaccine is seasonal and we don't know how often we'll have to vaccinate against COVID," he adds. "So making one vaccine might be more trouble than it's worth."

Provided by Northeastern University

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