

Four works better than three: An enhanced flu vaccine does the trick

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An intranasal vaccine that includes four weakened strains of influenza could do a better job in protecting children from the flu than current vaccines, Saint Louis University research shows.

Before each [influenza season](#), scientists predict which strains of flu will be circulating and make a trivalent [vaccine](#) that includes three strains of influenza -- two of influenza A and one of influenza B.

The ability to add another strain of influenza B without compromising the vaccine's ability to protect against the other three strains will allow scientists make a better vaccine, said Robert Belshe, M.D., professor of [infectious diseases](#) at Saint Louis University School of Medicine and the corresponding author of the [research article](#).

"The bottom line is adding another strain to make a quadrivalent vaccine improves our ability to protect against flu and doesn't reduce the body's immune response to the other strains," said Belshe, who also directs Saint Louis University's Center for [Vaccine Development](#).

"It should bring us better protection because there's less guess work than in the standard trivalent vaccine."

[Children](#) are more susceptible than adults to influenza from one of the B strains, which change less often than A strain viruses. Some winters, influenza B viruses – Victoria or Yamagata – cause most of the flu in children and significant infection in adults, Belshe said.

Preventing flu in children is key to protecting the entire population. "We think the most important way for flu to spread is through school-aged children," Belshe said.

In the 1980s, influenza B split into the two circulating lineages of virus, which have evolved into viruses that are quite different. Some years both B viruses or the B strain that doesn't match the vaccine circulate, which means the vaccine doesn't protect people from getting the flu.

"There are these two very different strains of influenza B that don't cross protect. Vaccinating against one strain of influenza B does little to protect against the other," Belshe said.

"It has not been possible to predict which strain has circulated. In the last 10 years, we predicted right five times. So you can flip a coin and do as well."

Previously, manufacturers had not had the capacity to produce a vaccine that protects against four strains of flu, but that is no longer the case, Belshe said.

The researchers tested versions of the FluMist vaccine, which is sprayed in the nose and contains live flu viruses that have been attenuated or weakened so they don't cause infection. The intranasal vaccine is made by MedImmune.

The nasal spray vaccine was tested in about 2,300 children between 2 and 19 years of age. The children were randomized to receive one of three vaccines: a vaccine containing four strains of influenza – two of influenza A and two of influenza B, or one of two vaccines that contained both influenza A strains and one of each of the influenza B strains. Researchers looked at the safety and antibody response to both influenza A and B viruses in children of different age groups who were

vaccinated.

Those children who receive vaccine containing four strains of flu had as robust of an [immune response](#) as those who received the vaccine that contained three strains. In addition, Belshe noted no clinically significant difference the safety of the vaccines, which were well tolerated.

"We saw stuffy noses, which we know is associated with FluMist, and an occasional low grade fever, which is similar to other childhood vaccines," Belshe said.

On Feb. 28, the U.S. Food and Drug Administration approved MedImmune's quadrivalent flu vaccine for use in people between the ages of 2 and 49. The vaccine could be ready for use during the 2013-2014 [influenza](#) season, pending a recommendation from the Advisory Committee on Immunization Practices, a group that advises the Centers for Disease Control and Prevention about vaccination issues.

An injected [flu vaccine](#) designed to protect against four [strains](#) of [flu](#) – instead of the current three – also is in the works, Belshe said.

Findings were published electronically ahead of print in the *Pediatric Infectious Disease Journal*. Belshe has been a member of a speaker's bureau and received research grants and consulting fees from MedImmune, which sponsored the study.

Provided by Saint Louis University

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