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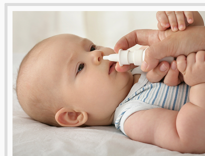
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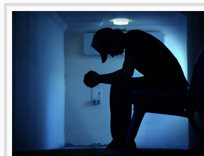
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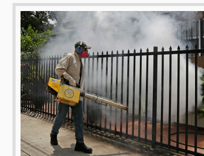
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COMMENTARY

The Rise and Fall of FluMist--Can the Nasal Spray Flu Vaccine Be Redeemed?

Paul A. Offit, MD

Disclosures | July 01, 2016

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Hi. My name is Paul Offit. I'm talking to you from the Vaccine Education Center, at The Children's Hospital of Philadelphia.

I want to talk about something that happened last Wednesday, June 22, 2016, at the meeting of the Advisory Committee for Immunization Practices (ACIP) when they made the following recommendation

[Editor's note: The following is from a statement prepared by the ACIP on June 22]:

> *In light of the evidence for poor effectiveness of LAIV—the live attenuated influenza vaccine, otherwise known as FluMist—in the United States over the last three influenza seasons, for the upcoming 2016-2017 season, the ACIP makes the interim recommendation that FluMist should not be used.*

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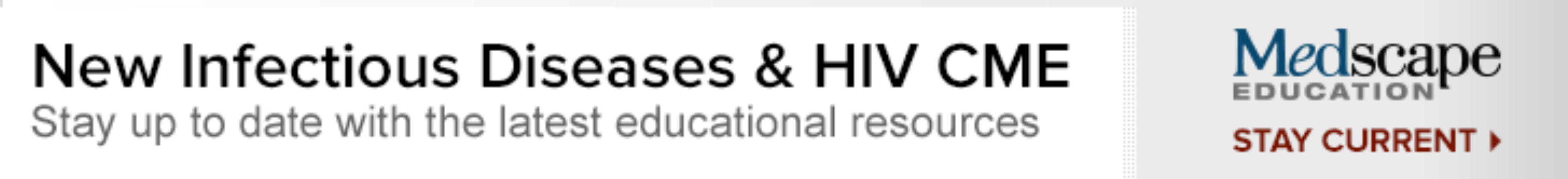
How did we get here? Years ago, we *preferred* FluMist over the inactivated influenza vaccine, for a few reasons: (1) It worked better than the inactivated vaccine; (2) In children, it is easier to give and is often preferred; (3) It reproduces itself at the nasal mucosal surface and induces local immunity, which in theory should allow the recipient who is exposed to the natural or wild-type influenza virus to shed less virus and therefore be less contagious.

Unfortunately, over the past few years, FluMist has *underperformed* compared with the inactivated vaccine, reaching a new low last year when the efficacy was estimated to be 3%, a rate that was indistinguishable from placebo. Why did this happen? It is hard to know, but when you give an inactivated vaccine with 15 µg of hemagglutinin per strain into a muscle, the antigen is taken up by local lymph nodes, processed, and presented to the immune system. When you give the FluMist vaccine, you are giving live, attenuated viruses that contain nanograms, rather than micrograms, of hemagglutinin. To get an adequate immune response, those viruses need to replicate.

By definition, these viruses are not replicating well, because either prior immunity or a dominant strain is affecting their capacity to replicate. Switching from the trivalent FluMist to the quadrivalent FluMist has not been effective over the past few years, perhaps because one of the added B strains caused the other vaccine viruses to reproduce less efficiently.

These are answerable questions. For example, we can look at the shedding of these viruses. That was the case with the oral polio vaccine. In that vaccine, the type 2 virus was actually contained in larger quantities because the other two viruses were able to replicate more efficiently on the intestinal mucosal surface. This question should be answered because FluMist was an excellent vaccine and hopefully it can be redeemed.



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