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## **High dose of flu vaccine boosts immune response in elderly**

Giving people age 65 and older a dose four times larger than the standard flu vaccine boosts the amount of antibodies in their blood to levels considered protective against the flu, more so than the standard flu vaccine does. The findings from a study of nearly 4,000 people were presented Oct. 26 at a national meeting on infectious diseases.

The higher dose of vaccine generally resulted in approximately 30 percent to 80 percent more antibodies against flu, long considered a good measure of protection.

Ann Falsey, M.D., associate professor of medicine at the University of Rochester School of Medicine and Dentistry and an infectious diseases specialist at Rochester General Hospital, presented the results at the 48th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC)/Infectious Diseases Society of America (IDSA) 46th annual meeting. The study was funded by sanofi pasteur, the vaccines division of sanofi-aventis Group, which makes Fluzone® Influenza Virus Vaccine, a licensed flu vaccine used widely in the United States and elsewhere.

The immune system generally weakens as we get older, not only leaving people more vulnerable to infection but also reducing their ability to respond to vaccination. While some studies have questioned the effectiveness of the flu vaccine in older adults, the nation's leading public health experts stress that it's a worthwhile, even life-saving, measure. About 90 percent of the estimated 36,000 people who die from flu-related causes in the United States each year are 65 and older.

"Without doubt, the influenza vaccine as it is today is beneficial for everyone, including older adults, and we strongly encourage every older person, and every person with a chronic illness, to get vaccinated," said Falsey. "However, older people generally don't respond to vaccines as well as young healthy adults and therefore, there is much room for improvement. The goal is to

increase immune response in older adults, since this is one of the populations most at risk for becoming seriously ill or dying from influenza."

The conventional flu vaccine is a combination of three circulating strains of flu, with each component consisting of 15 micrograms of material designed to evoke an immune response to protect a person against a particular type of flu. In the study headed by Falsey and conducted at 30 sites around the country in fall 2006, physicians compared the immune response brought about from a traditional flu vaccine compared to that from a vaccine shot containing four times as much material – 60 micrograms of material known as hemagglutinin for each of the three components.

In the study of people age 65 and older, the larger dose was given to 2,575 participants, while 1,262 subjects received the standard dose. Scientists checked the level of antibodies in the blood of the participants one month later. Generally, the large-dose vaccine increased the number of flu antibodies in study participants on average from about 30 to 80 percent. The level of such antibodies in the blood has long been considered a good gauge of how protected people are against the flu.

A greater percentage of people who received the high-dose vaccine had the typical side effects associated with the flu shot, including redness, swelling, and pain at the site of the injection, but the symptoms generally did not last longer than three days.

One especially interesting bit of data from the study, according to Falsey, was the effect of the larger dose on people who had no measurable antibodies against certain strains of the flu when the study began. Such people are considered especially vulnerable because their body doesn't have the "head start" that most people have in generating at least some protection against flu on their own, before the vaccine offers a needed boost. These people might also represent a group that does not respond well to vaccines in general.

Even in this group, the larger dose greatly increased the number of such individuals who ultimately had antibody levels considered protective. For example, 51 percent of such individuals who received the standard dose had an antibody level thought to be protective against one of the strains, H1N1, included in the vaccine, while 74 percent of participants who received the high dose reached the same levels. The percentages also went up for the other two strains included in the shot, from 82 to 96 percent for the H3N2 strain and from 41 to 56 percent for the type B strain.



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"These are the people at the highest risk for becoming very sick from influenza, and we saw significant improvement in the immune response in many of these people," said Falsey. "This is very encouraging."

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Among the study participants were 129 in Rochester, N.Y., including 100 people at Rochester General Hospital and 29 people at the University of Rochester Medical Center.

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