

# Prevention and treatment of influenza

Eric Henley, MD, MPH

University of Illinois College of Medicine at Rockford;  
School of Public Health, University of Illinois at Chicago

With this flu season, there are new indications for the traditional inactivated (killed) vaccine, a new intranasal vaccine, lab tests for rapid identification of influenza, and a need to review the role of antiviral treatments.

## ■ NEW PREVENTION MEASURES

Inactivated influenza vaccine is the best preventive measure against both type A and B strains of the virus. The vaccine's effectiveness depends somewhat on how well it matches to circulating virus antigens. **Table 1** lists the benefits of vaccination in various populations.

**Table 2** identifies the usual target populations for vaccine coverage. In the past 5 years, research has yielded several findings: the very young are at excess risk of influenza-related hospitalizations; adults aged 50 to 64 years have more high-risk conditions than previously thought; and cost-benefit analyses show a large economic toll of flu outbreaks manifested mainly as work and school absence. **Consequently, the Centers for Disease Control and Prevention (CDC) now recommends routine**

**vaccination of persons older than 50 years, and encourages vaccination of children between 6 and 24 months.** Children under 9 years being immunized for the first time must receive 2 vaccines at least a month apart to gain optimal protection. This requirement will make it challenging to immunize children aged <24 months, since they are already receiving a number of other vaccinations.

This year enough vaccine has been produced to allow both targeted and nontargeted groups to receive inactivated vaccine as soon as it is available.

## FluMist

The US Food and Drug Administration (FDA) recently approved FluMist, an intranasal vaccine with live, attenuated influenza virus, effective against both type A and B strains. Indications for its use are *healthy* people from 5 to 49 years. In this group, FluMist is an alternative to the traditional inactivated vaccine, but it is more expensive at \$46 a dose (compared with \$6 to \$10 for inactivated vaccine). Unvaccinated children 5 to 8 years of age should receive 2 doses 6 to 10 weeks apart.<sup>4</sup>

People with chronic conditions such as asthma, cardiovascular disease, diabetes, and

Correspondence: 1601 Parkview Avenue, Rockford, IL 61107.  
E-mail: ehenley@uic.edu.

TABLE 1

### Effectiveness of inactivated influenza vaccine

In the patient group...	...the vaccine prevents a potential...
Healthy adults <65 years	70%–90% of influenza illness
Children 1–15 years	77%–91% of influenza respiratory illness; no evidence that it prevents otitis media <sup>7</sup>
Adults >65 years	58% of influenza respiratory illness 30%–70% of hospitalizations for pneumonia and flu
Adults >65 years in nursing homes	30%–40% of influenza illness 50%–60% of hospitalizations 80% death rate

TABLE 2

### Persons who should receive inactivated influenza vaccine

#### Recommendations to date

- Persons aged >65 years
- Residents of nursing homes or other long-term care facilities
- Adults and children with chronic pulmonary or cardiac disorders, including asthma
- Adults and children with chronic metabolic diseases such as diabetes, renal insufficiency, hemoglobinopathies, and immunosuppression
- Children and adolescents receiving long-term aspirin therapy
- Women who will be in the 2nd or 3rd trimester of pregnancy during influenza season

#### New recommendations

- All adults aged >50 years
- All children aged 6–24 months

known or suspected immunodeficiency should not receive this vaccine until additional data are acquired about its effectiveness in these situations. In addition, because FluMist contains live influenza viruses, there is a potential for transmission from the vaccinated person to other persons. Therefore, clinicians should be cautious in its use when a patient requiring vaccination lives with immunosuppressed persons.

The rate of serious side effects with FluMist has been <1%, although mild side effects such as runny nose, fever, and headache occur slightly more often among vaccine than placebo recipients.

#### ■ IMPROVED DIAGNOSTIC TESTS

The development of new outpatient treatments for influenza has increased the desirability of making an accurate diagnosis. Clinical symptoms, particularly fever and cough, are somewhat helpful (in adults, sensitivity is 63%–78% and specificity is 55%–71%). Diagnostic accuracy is enhanced by awareness of active flu cases in your community. This information is available from local or state health departments and the CDC, and it is based on active surveillance through networks of

### Progress to date

Since 1989, a concerted public health effort has increased flu vaccine usage in adults older than 65 from 33% to 66% in 1999. Like many successful population health programs, this improvement has resulted from a focus on the core functions of public health:

- **Assessment**—regular surveys of vaccine coverage and local influenza outbreaks, continual identification of high-risk groups, and studies of vaccine efficacy and cost-effectiveness.
- **Assurance**—media campaigns to heighten awareness among consumers and providers of the benefits of vaccination and increased access to vaccine through physician offices, health departments, other health care worksites, and non-traditional sites such as malls and drug stores.
- **Policy development** — Medicare coverage of vaccine costs since 1993, Healthy People 2000 and 2010 national goals, and marketing campaigns to increase vaccine coverage supported by the Public Health Service in partnership with private organizations.

sentinel physician practices and emergency rooms. This is a good example of a reliable surveillance system helping physicians provide better clinical care.

In the past several years, the FDA has approved an array of rapid diagnostic tests that may improve medical decision-making. Approved tests are now available for Clinical Laboratory Improvement Act (CLIA)-waived (QuickVue Influenza A/B; ZstatFlu) and non-waived labs (BD Directigen Flu A+B; BD Directigen Flu A).

Nasal washes or swabs, not throat swabs, are the best method for obtaining specimens.

Compared with viral culture (the gold standard), reported sensitivities for these tests are 62%–73%, and specificities are 80%–99%.<sup>5</sup>

Because FluMist contains live viruses, there is a potential for transmission to other persons

A study conducted in a private practice reported sensitivities of 72%–95% and specificities of 76%–84%.<sup>3</sup> In this mainly pediatric population, the prevalence of influenza was about 50% by culture, and the positive predictive value (the likelihood that a positive test indicates true disease) ranged from 80%–86%, with a negative predictive value (the likelihood that a negative test indicates absence of disease) of 77%–90%.

In both studies, QuickVue was the best performing CLIA-waived test; the ZstatFlu test did not perform as well as the others. The tests generally give results in under 15 minutes, except ZstatFlu, which was more cumbersome to use. Since the prevalence of a condition in the population influences the predictive value of tests, all the tests perform better at finding true disease during active flu outbreaks than at the beginning or end of outbreaks when patients are less likely to have influenza.

The tests range in price from \$15 to \$25.

### ■ ANTIVIRAL TREATMENTS

Amantadine and rimantadine can reduce the duration of uncomplicated influenza A by about 1 day when started within 2 days of the onset of illness.

The newer drugs, zanamivir and oseltamivir, can reduce the duration of uncomplicated influenza A and B by about 1 day compared with placebo. Data are limited regarding the benefits of these drugs for patients at high risk of serious complications, or for children, although 1 study has shown a decrease in the incidence of otitis media among children taking oseltamivir.

Zanamivir is approved for adults and for children older than 7 years. It is administered via inhalation twice a day and costs \$48 for the standard 5-day treatment.

When used prophylactically, antiviral drugs must be taken daily for the duration of flu season

Oseltamivir is approved for adults and for children older than 1 year. It is taken orally twice daily, with dose based on age and weight. It costs \$60 for a 5-day treatment.

**Prophylaxis.** Amantadine and rimantadine are approved for prophylaxis against influenza A, and prevent 70%–90% of cases. Oseltamivir is approved for prophylaxis in adults and children older than 13 years. When used prophylactically, these drugs must be taken daily for the duration of influenza activity in the community. This can mean taking medication for weeks, which would be quite expensive in the case of oseltamivir.

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