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Prevention and Control of Influenza and Pneumonia

Influenza and pneumococcal pneumonia are important causes of increased morbidity and mortality in the United States and in New York City; both diseases are vaccine-preventable. This issue provides information on the epidemiology, target populations for vaccination, and recommendations for vaccine use among all age groups. The information that follows is adapted mostly from recent *Morbidity and Mortality Weekly Reports* published by the Centers for Disease Control and Prevention.[1, 5]

Use of Influenza Vaccine

According to estimates of the Centers for Disease Control and Prevention (CDC), influenza epidemics result in approximately 114,000 excess hospitalizations and 20,000 deaths annually[1] Each year more than 2,000 people die from influenza in New York City; most are 65 years of age and older. An annual influenza vaccination is recommended for people at high risk for complications of influenza and is the primary method for preventing influenza and its severe complications.

Influenza vaccine is recommended for:

- all persons 50 years of age and older, with an emphasis on those over 65;
- persons 6 months and older with chronic medical conditions such as heart disease, pulmonary disorders including asthma, diabetes, kidney disease, hemoglobinopathies, and compromised immune systems (HIV or immunosuppressive therapy);
- residents of nursing homes and other chronic care facilities for persons of any age who have chronic medical conditions;
- pregnant women who will be in the second or third trimester of pregnancy during the influenza season;
- persons aged 6 months to 18 years on long term aspirin therapy;
- health care workers, including physicians, nurses, and other personnel in both hospital and outpatient care settings, including emergency rooms;
- close contacts of high risk individuals including household members and persons who provide home care;
- employees of nursing homes, chronic care facilities, assisted living and other residences who have contact with persons at high risk.

The recommendation to provide annual influenza vaccination to all individuals beginning at 50 years of age was instituted in 2000. Up to one third of people aged 50 to 64 years have underlying medical conditions that place them at high risk for complications from influenza. Age-based strategies have been more successful in increasing vaccine coverage than patient-selection strategies based on medical conditions.

Influenza vaccine coverage:

In 1999 in New York City, 52% of persons aged 65 and older reported receiving influenza vaccine (vs. 67% in the rest of New York State). Vaccination rates in blacks and Hispanics in this age group lag behind those of whites, with only 33% of blacks and 62% of Hispanics reporting receiving influenza vaccine in New York State in 1999.[2] Reported vaccination rates for children at high risk are low. The United States National Healthy People 2010 Immunization coverage goal for influenza vaccine is 90% for persons over 65 years of age.[3] Achievement of this goal will require a substantial increase in vaccination efforts directed toward this age group.

Practice-based strategies that have been demonstrated to be effective in increasing influenza coverage rates include labeling the charts of high risk patients and using reminder/recall systems. Physician recommendation to receive influenza vaccine is important for patient acceptance of vaccination. Use of standing orders is recommended for long-term care, inpatient and outpatient facilities. Health care facilities should offer influenza vaccination to all personnel, with particular emphasis on those persons who care for members of high risk groups.

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Influenza vaccine:

The 2001-2002 trivalent vaccine virus strains are A/Moscow/10/99 (H2N2)-like, A/New Caledonia/20/99 (H1N1)-like, and B/Sichuan/379/99-like strains. The influenza vaccine has few side effects. Because the vaccine is made of inactivated virus it cannot cause influenza.

The effectiveness of influenza vaccine depends primarily on the age and immunocompetence of the vaccine recipient and the degree of similarity between the viruses in the vaccine and those in circulation that season. Among healthy young adults, influenza vaccine is up to 90% effective in preventing clinical illness. For the elderly population, the vaccine is up to 70% to 80% effective in preventing secondary complications and reducing the risk for influenza-related hospitalization and death.

The ideal time for influenza vaccination is October through November. Vaccine should be offered throughout the influenza season even after influenza activity has been documented in the community. In the United States, seasonal activity can begin to increase in the early winter but in past years has not reached peak levels until late December through early March. Therefore, vaccine administered after November is very likely to be beneficial.

Influenza vaccine supply:

There were substantial delays in the distribution of influenza vaccine in 2000 because of difficulties with the vaccine manufacturing process. This year, approximately 56% of the total supply is expected to be distributed by the end of October, an additional 31% will be delivered in November and the final 13% is expected in early December.

Surveillance for influenza:

Local and state health departments, in collaboration with the CDC, conduct surveillance for influenza from October through mid-May. The goals of surveillance are to 1) determine when and which influenza viruses are circulating, 2) monitor influenza related illness and 3) measure the impact of influenza on overall morbidity and mortality. There are four major components of influenza surveillance: nationwide laboratory surveillance, including three laboratories in New York City; a mortality reporting system based on vital statistics; state and territorial epidemiologists reports on the estimated level (sporadic, regional and widespread) of influenza activity (which in New York is done at both the State and City level); and an influenza sentinel physician surveillance network. In New York City, the Sentinel Physician program began last year with 20 sentinel sites; in 2001/2002 this program expanded to over 40 sites.

In addition to participating in the national surveillance system for influenza, the New York City Department of Health also monitors 911-EMS calls throughout the year to detect increases in respiratory illness that could indicate influenza-like activity.

When influenza virus is first detected in the city, the New York City Department of Health routinely notifies key offices in hospitals and nursing homes citywide via the Public Health Alert Broadcast System. Updates on the level of activity and the types/subtypes of influenza circulating are sent during the season, as needed.

Use of antiviral drugs:

Antiviral drugs for influenza are an adjunct to influenza vaccine for the control and prevention of influenza. These agents are not a substitute for vaccination. There are currently four licensed agents effective against influenza: amantadine, rimantadine, zanamivir, and oseltamivir (Table 1). The widespread and routine use of antiviral drugs is not recommended.

Antiviral drugs are important for the control of influenza outbreaks in institutions, along with vaccination, droplet precautions, cohorting of patients, and restricting movement of ill persons. For detailed information on indications for use of antiviral drugs for treatment and prophylaxis, dosage, side effects and adverse reactions, see the references below.[1,4]

Table 1. Recommendations for Use of Antivirals for the Treatment and Prophylaxis of Influenza

Drug	Activity Against Influenza A	Activity Against Influenza B	Approved for Treatment (Recommended Age Group)	Approved for Prophylaxis (Recommended Age Group)
Amantadine	Yes	No	Yes (Adults and children ≥ 1 year)	Yes (Adults and children ≥ 1 year)
Rimantadine	Yes	No	Yes (Adults)	Yes (Adults and children ≥ 1 year)
Zanamivir	Yes	Yes	Yes (Persons ≥ 7 years)	No
Oseltamivir	Yes	Yes	Yes (Adults and children ≥ 1 year)	Yes (Persons ≥ 13 years)

Use of Pneumococcal Polysaccharide Vaccine (PPV23)

There are approximately 500,000 cases of invasive pneumococcal disease in the United States resulting in over 40,000 deaths annually.[5] Over half of these deaths are preventable with vaccination. Fatality rates are highest among persons 70 years and older. In addition, the increasing prevalence of penicillin-resistant and multi-drug resistant pneumococcus reinforces the importance of primary prevention through vaccination of high risk populations. During 2000, the overall prevalence of penicillin resistance (MIC > 0.1µg/ml) among *S. pneumoniae* isolates in New York City was 26%; 10% of isolates were highly resistant (MIC > 2.0µg/ml).

PPV23 is recommended for persons older than 65 years and for many groups with the same risk factors that indicate a need for influenza vaccine. Pneumococcal vaccine is available throughout the year. However, during the influenza season there is an additional opportunity to ensure that eligible populations are vaccinated. The use of pneumococcal vaccine is encouraged to reduce the risk of bacterial complications of influenza infection.

In 1999 in New York City, 28% of persons 65 years and older said that they had been vaccinated against pneumococcal disease (vs. 57% in the rest of the state).[2] As with influenza vaccine, there is a marked racial disparity in vaccination rates, with blacks and Hispanics reporting vaccination much less frequently than whites.

Standing orders can facilitate the appropriate administration of pneumococcal vaccine at all ambulatory care centers and in-patient facilities. New York State law requires that all residents and employees in adult long-term residential facilities be offered pneumococcal vaccine.

The New York City Department of Health offers these guidelines:

- Beginning in October, influenza vaccine should be offered routinely during office visits to persons at high risk for complications from influenza and to their close contacts.
- Standing orders should be put in place at all ambulatory care centers, in-patient facilities and long-term care facilities to facilitate administration of influenza vaccine to all persons over 50 years of age.
- Vaccinate against pneumococcal disease. Use of standing orders should be considered to facilitate administration of the vaccine to all persons over 65 years of age.
- The pneumococcal vaccine can be given simultaneously with influenza vaccine.

The New York City Department of Health will provide updated information on our website (www.nyc.gov/health) on vaccine supply and clinic and outreach sites where influenza vaccination is available. Information on sites providing influenza vaccine can also be obtained by calling 866-FLU-LINE. Additional information may be obtained from the CDC (www.cdc.gov/nip/flu).

Resource List:

Information for medical providers **212-676-2264**
Temporary number: 347-538-0099

Information on NYCDOH adult immunization initiatives . . . **212-676-9936 or 212-676-2277**

Influenza Hotline **866-FLU-LINE**

To report influenza outbreaks at institutions **212-788-9830**
Temporary number: 212-295-5671

References:
1. Centers for Disease Control and Prevention. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2001;50(No. RR-4).
2. Centers for Disease Control and Prevention. National Center for Chronic Disease Prevention and Health Promotion, Behavioral Science Branch. Behavioral Risk Factor Surveillance System 1999.
3. United States Department of Health and Human Services. *Tracking Healthy People 2010.* Washington DC: U.S. Government Printing Office, November 2000, Chapter 14.
4. Pickering, L.K. ed. *2000 Red Book: Report of the Committee on Infectious Diseases,* 25th Edition. Elk Grove Village, IL.: American Academy of Pediatrics, 2000.
5. Centers for Disease Control and Prevention. Prevention of pneumococcal disease. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1997;46(No. RR-8).

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