



City Health Information

September 2008

The New York City Department of Health and Mental Hygiene

Vol. 27(8):63-70

INFLUENZA PREVENTION AND CONTROL: 2008-2009

- Vaccination is now recommended for *all* children aged 6 months through 18 years.
- Every adult who wants to be immunized should receive an annual influenza vaccination unless there are contraindications.
- All health care workers should be vaccinated every year; make sure you and your staff get influenza shots early in the season.
- Vaccination should continue throughout the influenza season.

Influenza is a serious illness that results in approximately 36,000 deaths and 226,000 hospitalizations annually in the United States (US),^{1,2} with an estimated direct cost of \$10.4 billion.³ In New York City (NYC), influenza and pneumonia combined were the third leading cause of death in 2006.⁴

Annual influenza vaccination is the most effective way of preventing influenza and its complications. When there is an optimal match between the available vaccine and circulating influenza strains, immunization can decrease the chances of getting influenza by 70% to 90% in healthy adults. Vaccination with a less than optimal match will protect against different, but related, strains of influenza virus, thereby reducing the severity of the illness.⁵ Despite the proven benefit of influenza vaccination, immunization rates in NYC are below the Healthy People 2010 goals.^{6,7}

In July 2008, the Centers for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) issued guidelines for the 2008-2009 influenza season recommending immunization of all children aged 6 months through 18 years. The new recommendations are based on⁸:

- Accumulated evidence that influenza vaccine is effective and safe for school-aged children.

WHO SHOULD BE VACCINATED AGAINST INFLUENZA?

- Anyone who wishes to reduce the risk of becoming ill with influenza or transmitting it to others.
- Children aged 6 months through 18 years.
- People aged 50 years and older.
- Women who will be pregnant during the influenza season.
- Adults with chronic health conditions (**Table 1**).
- Residents of long-term care facilities who are ≥ 6 months of age.
- Health care workers.
- Household contacts and caregivers of children aged <5 years, adults aged >50 years, and adults with chronic health conditions, with particular emphasis on contacts of children aged <6 months.



TABLE 1. CHRONIC MEDICAL CONDITIONS/ INDICATIONS FOR INFLUENZA VACCINATION⁸

- Cardiovascular disease, except hypertension.
- Pulmonary disorders, including chronic obstructive pulmonary disease and asthma.
- Chronic metabolic diseases, including all types of diabetes.
- Renal disease, including renal failure and renal dysfunction.
- Hemoglobinopathies such as sickle cell disease and thalassemia.
- Immune dysfunction (e.g., HIV) or immunosuppressive therapy.
- Cognitive dysfunction, spinal cord injuries, seizure disorders, or other neuromuscular disorders that can compromise respiratory function or the handling of respiratory secretions or that can increase the risk for aspiration.
- Long-term aspirin therapy because of the risk of Reye syndrome.

- Increased evidence that influenza has substantial adverse impacts among school-aged children and their contacts (e.g., school absenteeism, increased antibiotic use, medical care visits, parental work loss).
- An expectation that a simplified recommendation for all school-aged children and adolescents will improve vaccine coverage levels among the approximately 50% of school-aged children with a risk- or contact-based indication for annual influenza vaccination.

In addition to the direct benefit of immunization in children, evidence suggests that reducing influenza among children has the potential to reduce influenza among their household contacts and within the community.⁸

INFLUENZA IN CHILDREN

Influenza in children results in increased visits to clinics, emergency departments, and hospitals, as well as excess use of antibiotics.^{9,10} Rates of influenza-associated hospitalization are higher among infants and young children than among older children and are similar to rates for high-risk groups, including people ≥ 65 years of age.⁸ Children with ACIP-defined high-risk conditions (**Table 1**) have an even greater risk for influenza-related hospitalization and death. Between 1994 and 2000, the nationwide hospitalization rate in this high-risk group was 44.6 per 10,000 person-months.¹⁰ Mortality associated with influenza in children is uncommon; however, deaths attributed to co-infection with influenza and *Staphylococcus aureus*, particularly methicillin-resistant *S. aureus* (MRSA), have increased during the past 4 influenza seasons (CDC, unpublished data).

ACIP now recommends annual vaccination for all children aged 6 months through 18 years. Previously, annual vaccination focused on children aged 6 months through 59 months and those with risk factors for influenza-associated complications (**see Table 1**), but recommendations have now been updated to also include annual vaccination of all children aged 5 years through 18 years. If feasible, these new recommendations should begin in 2008 when the vaccine for the 2008-2009 influenza season becomes available, but should be fully implemented no later than during the 2009-2010 influenza season.⁸ This will expand routine influenza vaccination coverage to 1.3 million NYC children.¹¹

Vaccine effectiveness is lower in children who received only 1 dose in their first year of vaccination compared to children who receive 2 doses in their first vaccination year.¹²⁻¹⁴ In addition, antibody responses are significantly higher when young children are given 2 doses.⁸ In NYC, only 18% of children aged 6 to 59 months were fully protected with the recommended vaccination schedule last year.¹⁵

Prevent Nosocomial Transmission! Health care workers can protect themselves and their patients against influenza with annual vaccination. Despite this fact, only 33% of NYC health care workers were immunized in 2005.^{7,16}

INFLUENZA IN HIGH-RISK ADULTS

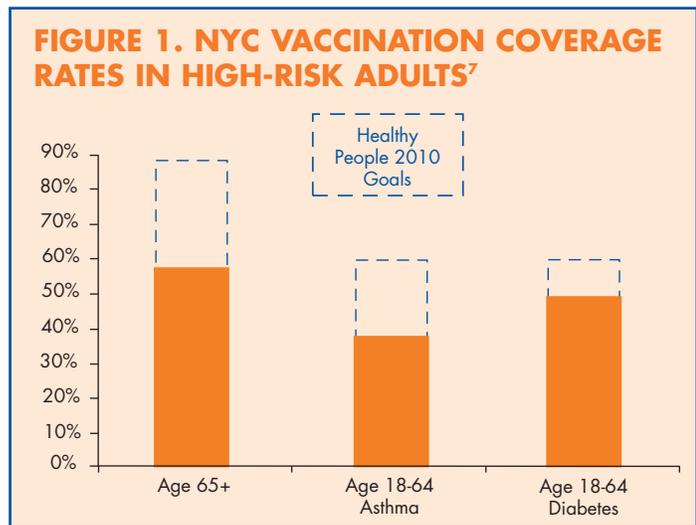
People aged 65 years and older: People aged 65 years and older have the highest mortality rates due to influenza infection.¹ In 2006, more than 2,000 elderly people in NYC died of influenza- and pneumonia-related illnesses.⁴ Vaccination coverage among New Yorkers in this age group is below national goals (**Figure 1**), and rates vary by ethnicity, with coverage of 47%, 59%, 63%, and 64% for blacks, Latinos, Asians, and whites, respectively.⁷

Adults with chronic illnesses: Certain chronic illnesses, including asthma and diabetes, increase the risk of influenza-related complications and hospitalizations.¹⁷ NYC coverage rates for adults with asthma and diabetes are below the Healthy People 2010 goals (**Figure 1**).^{6,7}

Pregnant women: Pregnancy increases a woman’s risk of influenza-related complications (see box on page 67).^{8,18-20}

ADMINISTERING VACCINE

Influenza vaccination season is not the same as influenza transmission season. Transmission usually peaks in February (Figure 2). Vaccination should begin as soon as vaccine is received. Continue vaccinating into the new calendar year—outbreaks have occurred in NYC as late as May. Children 6 months through 8 years of age need 2 doses separated by at least 4 weeks (28 days) in their first season of vaccination, so it is important to begin vaccination early in the season. If only 1 dose was administered in the first season of vaccination, then 2 doses should be given in the second season; in subsequent seasons, only 1 dose is



recommended.⁸ Be aware of guidelines for vaccinating against pneumococcal disease as well (see box below).²¹ **Figure 3** lists suggested steps for increasing vaccination coverage.²²

PNEUMOCOCCAL DISEASE AND VACCINATION

Invasive pneumococcal disease led to 5,600 deaths in NYC adults in 2003; 44% of cases and 60% of deaths were in adults aged ≥65 years.²³ Only half (48%) of NYC adults ≥65 years of age were vaccinated against pneumococcal disease in 2006.⁷

Who should get pneumococcal vaccine (PV23)?²¹

- Ages 65 and older.
- Ages 2 through 64 with chronic cardiovascular, pulmonary, or liver disease; diabetes; cochlear implants; functional or anatomic asplenia (including those with sickle cell disease).
- Immunocompromised people ≥2 years of age, including those with HIV, leukemia, lymphoma, Hodgkin’s disease, multiple myeloma, generalized malignancy, chronic renal failure, nephritic syndrome; dialysis patients; people receiving immunosuppressive therapy; organ or bone marrow transplant patients.

Revaccination is not done routinely. However, people who received a first dose before age 65 should receive a second dose after turning 65 if more than 5 years have elapsed since the previous dose. For further recommendations for revaccination, see www.cdc.gov/mmwr/preview/mmwrhtml/00047135.htm.

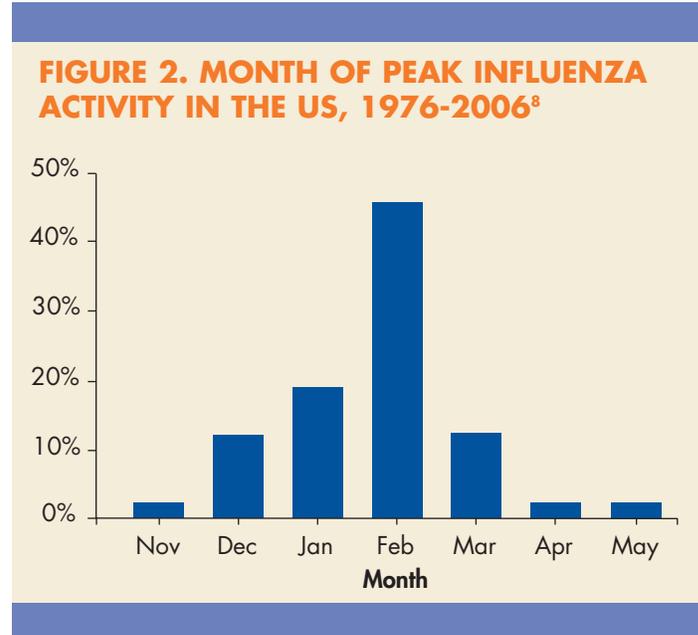


FIGURE 3. FOUR EASY STEPS TO IMPROVING INFLUENZA VACCINATION COVERAGE

1. Prepare — Be aware of the new ACIP immunization guidelines and changes to NYS Public Health Law (see page 67)

- **Order enough vaccine from the manufacturer in time for delivery early in influenza season.** For up-to-date information about the purchase of influenza vaccine, go to www.nyc.gov/health/flu or call the Provider Access Line at 1-866-692-3641/1-866-NYC-DOH1. For all eligible children and adolescents, vaccine must be ordered through the Vaccines for Children (VFC) Program (212-447-8175).
- Vaccines should be stored at the correct temperature and handled properly to retain their potency. Make sure your staff are aware of proper procedures for each vaccine. See www.immunize.org/catg.d/p3035.pdf for a sample checklist.
- Use recall/reminder tools such as e-mails and postcards to help maintain vaccination schedules.
- Use standing orders in all large practices, ambulatory care centers, inpatient facilities, EDs, and long-term care facilities. See <http://home2.nyc.gov/html/doh/downloads/word/imm/standingordersplansept222005.doc> for a sample template.



2. Promote — Use Every Office Visit as an Opportunity to Vaccinate!

- Be a role model. Get vaccinated and require that your staff do the same.
- Recommend vaccination to your patients at each visit—it will increase the vaccination rate.²²
- **Influenza vaccine saves lives. Encourage vaccination as you would any critical treatment or intervention.**



3. Provide

- Provide educational materials and discuss them with patients. Materials are available in multiple languages at www.nyc.gov/html/doh/html/imm/flu-ptk5.shtml (call 311 for bulk supplies).
- Give patients a Vaccine Information Statement (VIS), available at www.immunize.org/VIS, to read before they are vaccinated.
- Let patients and staff know you are serious about the importance of influenza vaccination. Have those who refuse vaccine sign a Refusal to Receive Vaccination form, available at <http://home2.nyc.gov/html/doh/downloads/pdf/imm/immiv-refusal.pdf>.



4. Progress

- Use the Vaccine Administration Record for Adults or a preventive services flow sheet to record vaccines for each patient (www.nyc.gov/html/doh/downloads/pdf/imm/imm-var.pdf). The Primary Care Information Project provides electronic health records software that can track preventive services for each patient. Visit www.nyc.gov/pcip for information.
- Determine what percentage of eligible patients identified at the start of the influenza season received vaccine. Improve this percentage season to season.

REPORTING REQUIREMENTS

- All immunizations for children <19 years MUST be reported to Citywide Immunization Registry (CIR), at **212-676-2323**.
- Immunizations for adults ≥19 years MAY be reported to CIR if the patient's consent is documented in the chart.
- Immunizations for adults ≥19 years are VOLUNTARY, but encouraged by the NYC DOHMH.

INFLUENZA: CONSIDERATIONS IN PREGNANCY

- Risk of influenza-related hospitalization is >4 times higher than for nonpregnant women.¹⁸
- Risk of complications is comparable to that for nonpregnant women with high-risk medical conditions.¹⁹
- All women who will be pregnant during influenza season should be vaccinated with inactivated influenza vaccine.⁸
- Pregnant women should be immunized with a vaccine containing no more than 1.25 µg of mercury per 0.5-mL dose (see **Table 2** for vaccine-specific information).²⁰

Several trivalent inactivated influenza vaccines (TIV) and a live attenuated influenza vaccine (LAIV) will be available for the 2008-2009 season (**Table 2**).²⁰ None of these vaccines should be given to patients with a known anaphylactic hypersensitivity to eggs or to other components of the vaccine.

TIV

TIV is given as an intramuscular injection. Minor illnesses with or without fever do not contraindicate use of influenza vaccine, and people with moderate to severe acute febrile illness should defer vaccination until their illness improves. A history of Guillain-Barré syndrome (GBS) within 6 weeks following a dose of TIV is considered to be a precaution for use of TIV.⁸

LAIV

LAIV (FluMist®) is licensed for use only in healthy people aged 2 through 49 years. LAIV should not be given to pregnant women or to patients with asthma/recurrent wheezing, altered immunocompetence, underlying medical conditions predisposing to complications (**Table 1**), or a history of GBS. Screen for possible reactive airway disease when considering use of LAIV for children aged 2 through 4 years and use TIV if a history of hyperreactivity is identified.⁸

ABOUT THIMEROSAL²⁴⁻²⁷

Thimerosal has been safely used as a preservative in certain vaccines since the 1930s. In July 1999, the Public Health Service (PHS) agencies, the American Academy of Pediatrics (AAP), and vaccine manufacturers agreed that thimerosal should be reduced or eliminated in vaccines. With the exception of some influenza vaccines (**Table 2**), thimerosal is no longer used in routinely recommended childhood vaccines.

Thimerosal dissociates into ethyl mercury, which is rapidly cleared from the body. Ethyl mercury is substantially different from methyl mercury, the type of mercury that has been associated with adverse health effects and is found in contaminated fish.

The Institute of Medicine has reviewed a large number of epidemiologic studies related to thimerosal and autism, and has concluded that the evidence does not support a causal relationship between thimerosal-containing vaccines and autism.

NEW YORK STATE PUBLIC HEALTH LAW §2112

Effective July 1, 2008, vaccines containing more than trace amounts of mercury may not be given to women who know they are pregnant or to children less than 3 years of age. For all vaccines except influenza, trace amounts are defined as ≤0.5 µg mercury per 0.5-mL dose.

No routinely recommended childhood vaccines, except multidose vials of influenza vaccine, contain thimerosal. An influenza vaccine may contain no more than 0.625 µg mercury per 0.25-mL dose for children under 3 years of age, and no more than 1.25 µg mercury per 0.5-mL dose for women who know they are pregnant (see **Table 2**). It is not necessary to test women for pregnancy before administering any influenza vaccine or any vaccines that contain more than a trace amount of mercury.²⁰

For more information, see

www.health.state.ny.us/prevention/immunization/providers/docs/state_law_restricting_thimerosal_2008-04-23.pdf.

TABLE 2. APPROVED INFLUENZA VACCINES: 2008-2009 SEASON^{8,20}

Vaccine	Trade Name	Ages	Package	Dose (mL)	Route	Thimerosal	Mercury ^a (µg/dose)
Inactivated							
TIV	Afluria® (CSL Biotherapies)	≥18 years	Single-dose syringe	0.5	IM	No	
		≥18 years	Multidose vial	0.5	IM	Yes	24.5
TIV	Fluzone® (sanofi pasteur)	6-35 months	Single-dose syringe	0.25	IM	No	
		≥36 months	Single-dose syringe	0.5	IM	No	
		≥36 months	Single-dose vial	0.5	IM	No	
		≥6 months	Multidose vial	Age-dependent	IM	Yes	25
TIV	Fluvirin® (Novartis)	≥4 years	Single-dose syringe	0.5	IM	Trace	≤1
		≥4 years	Multidose vial	0.5	IM	Yes	25
TIV	Fluarix® (GlaxoSmithKline)	≥18 years	Single-dose syringe	0.5	IM	Trace	≤1
TIV	FluLaval™ (GlaxoSmithKline)	≥18 years	Multidose vial	0.5	IM	Yes	25
Live, attenuated							
LAIV	FluMist® (MedImmune)	2-49 years	Single-dose dispenser	0.2	Intranasal	No	

Vaccination Schedules^a

TIV—Dose for children 6 through 35 months is 0.25 mL; dose for people aged ≥36 months is 0.5 mL. Two doses administered at least 1 month apart are recommended for children aged 6 months through 8 years who are receiving TIV for the first time; those who only received 1 dose in their first year of vaccination should receive 2 doses in the following year. In subsequent years, only 1 dose is recommended.

LAIV—Children aged 2 through 8 years: 2 doses ≥4 weeks apart in their first season of vaccination; those who received only 1 dose in their first year of vaccination should receive 2 doses in the following year. In subsequent years only 1 dose is recommended. People aged ≥9 years: 1 dose.

IM = intramuscular injection. Adults and older children should be vaccinated in the deltoid muscle; the preferred site for infants and younger children is the anterolateral aspect of the thigh. Recommended needle lengths: adults and older children, ≥1 in. (>25 mm) (longer needles may be needed, depending on the patient's size); children with adequate deltoid muscle mass, 7/8 in. to 1.25 in.; children aged <12 months, 7/8 in. to 1 in.

^aSources: ACIP recommendations⁸ and product prescribing information.

INFLUENZA PROPHYLAXIS AND TREATMENT

Oseltamivir and zanamivir are recommended for prophylaxis and treatment of influenza, especially in people deemed at high risk for serious complications secondary to influenza infection.^{8,20,28} Both oseltamivir and zanamivir are Pregnancy Category C medications, meaning that they have not been studied in pregnant women; therefore, they should be used during pregnancy only if the benefit outweighs any potential risk. Amantadine and rimantadine are no longer recommended due to high rates of resistance.⁸ Over-the-counter cold and influenza medicines should not be used to treat infants and children <2 years of age.²⁹

REPORTING AND SURVEILLANCE

The NYC Health Department and its many partners actively monitor influenza activity. Throughout the influenza season, regular updates on levels of influenza activity and vaccine availability are posted on the NYC DOHMH Health Alert Network (HAN) and on the influenza Web site, www.nyc.gov/health/flu. Hospitals and nursing homes must report all laboratory-confirmed nosocomial cases of influenza (not just outbreaks) and any increased incidence of influenza-like illness (temperature 100°F with cough or sore throat, in the absence of another known etiology) on the Nosocomial Report Form DOH 4018 (**Resources**). Questions about nosocomial influenza reporting can be directed to the NYC DOHMH Influenza Surveillance Coordinator at 212-442-9050.

All suspected influenza-related deaths in children younger than 18 years of age should be reported to the NYC DOHMH Bureau of Communicable Disease at 212-788-9830, 9:00 am to 5:00 pm, Monday through Friday. After hours, call the Poison Control Center at 212-POISONS (212-764-7667).

Report all clinically significant reactions that follow vaccination to the Vaccine Adverse Event Reporting System at www.vaers.hhs.gov or 1-800-822-7967, or call the NYC DOHMH Bureau of Immunization at 212-676-2284/88. Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or at 1-800-338-2382.

JOIN THE NYC HEALTH DEPARTMENT'S INFLUENZA SURVEILLANCE PROGRAM

Become part of an active surveillance system for influenza-like illness; in less than 30 minutes a week, you can participate as a sentinel physician in an important national public health initiative. The data you provide will help us monitor the impact of influenza in NYC. Providers who report for 4 consecutive weeks will be given 1 free box of the QuickVue® Influenza A&B rapid test, which will allow them to test up to 20 patients in their office. This test has been CLIA-waived to be used as a point-of-care diagnostic tool.

Please call Beth Nivin at 212-442-9050 (e-mail bnivin@health.nyc.gov) or Alaina Stoute at 212-788-4150 (e-mail astoute@health.nyc.gov).



SUMMARY

Influenza vaccine saves lives. Use every visit as an opportunity to vaccinate. Children aged 6 months to 18 years, adults aged ≥50 years, people at high risk for influenza complications, and anyone who wants to be protected against influenza should get vaccinated. Vaccinate as soon as influenza vaccine becomes available, and continue to vaccinate throughout the influenza season. Be aware of the indications for vaccination against pneumococcal disease, a serious complication of influenza. ♦

Report suspected cases of vaccine-preventable disease to the NYC DOHMH Bureau of Immunization Surveillance Unit at 212-676-2284/88; after hours, call 212-POISONS.

RESOURCES

NYC Department of Health and Mental Hygiene

- Provider Access Line, 9:00 am to 5:00 pm:
1-866-692-3641/1-866-NYC-DOH1
After business hours: 212-764-7667
- Influenza Web site:
www.nyc.gov/health/flu
- Health Alert Network (HAN):
www.nyc.gov/health/nycmed
(or 1-888-692-6339)
- E-mail questions to DOHMH:
nycflu@health.nyc.gov
- Provider information:
www.nyc.gov/html/doh/html/imm/impinfo.shtml

New York State Department of Health

- Bureau of Communicable Disease Control:
518-473-4439
- Nosocomial Report Form DOH 4018:
www.health.state.ny.us/forms/doh-4018.pdf

Other Organizations

- Centers for Disease Control and Prevention:
1-800-232-2522 or www.cdc.gov/flu
(influenza information)
- Immunization Action Coalition:
www.immunize.org (influenza information)
- National Foundation for Infectious Diseases:
www.nfid.org

References Available Online: www.nyc.gov/html/doh/downloads/pdf/chi/chi27-8.pdf.

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Influenza Prevention and Control: 2008-2009

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Objectives

At the conclusion of this activity, participants should:

1. Describe indications for the use of influenza vaccine.
2. List valid contraindications to the use of influenza vaccine.
3. List targeted populations for pneumococcal polysaccharide vaccine (PPV23).

CME Accreditation Statement

The New York City Department of Health and Mental Hygiene (NYC DOHMH) is accredited by the Medical Society of the State of New York to sponsor continuing medical education for physicians. The New York City Department of Health and Mental Hygiene designates this continuing medical education activity for a maximum of 1.00 AMA PRA Category 1 credit(s)[™]. Each physician should only claim credit commensurate with the extent of their participation in the activity.

CNE Accreditation Statement

The New York City Department of Health and Mental Hygiene is an approved provider of continuing nursing education by the New York State Nurses Association, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

This CNE activity has been awarded 1.00 contact hours.

It has been assigned code 6WXLFX-PRV-075.

Participants are required to submit name, address, and professional degree. This information will be maintained in the Department's CME/CNE program database. If you request, the CME/CNE Program will verify your participation and whether you passed the exam.

We will *not* share information with other organizations without your permission, except in certain emergencies when communication with health care providers is deemed by the public health agencies to be essential or when required by law. Participants who provide e-mail addresses may receive electronic announcements from the Department about future continuing education activities as well as other public health information.

Participants must submit the accompanying exam by September 30, 2009.

CME/CNE Faculty:

Toni A. Olasewere, MD, MS
Jane R. Zucker, MD, MSc
Denise Ungaro, RN, BSN

All faculty are affiliated with the NYC DOHMH.

The faculty does not have any financial arrangements or affiliations with any commercial entities whose products, research, or services may be discussed in this issue.

CME/CNE Activity Influenza Prevention and Control: 2008-2009

September 2008

1. Which of the following is a contraindication for trivalent inactivated influenza vaccine (TIV)?

- A. Pregnancy.
- B. Simultaneous administration of pneumococcal polysaccharide vaccine (PPV23) and measles, mumps, and rubella vaccine (MMR) on the same day.
- C. Non-anaphylactic reaction to eggs.
- D. Health care worker in the Intensive Care Unit (ICU).
- E. All of the above.
- F. None of the above.

2. Which of the following is true?

- A. Children 6 months to 18 years of age should receive influenza vaccination annually.
- B. Children 6 months to 8 years of age without prior immunization with TIV should receive 2 doses of vaccine the first year they are vaccinated, with the second dose 28 or more days after the first dose.
- C. Household members and other contacts of children under 5 years of age should receive annual influenza vaccination.
- D. All of the above.
- E. None of the above.

3. Which of the following individuals has a valid contraindication for LAIV, and should receive TIV annually?

- A. Pregnancy at 18 weeks of gestation.
- B. Immunosuppression from any cause.
- C. Children and adolescents receiving long-term therapy with aspirin or other salicylates.
- D. Children 6 months to 2 years of age.
- E. All of the above.
- F. None of the above.

4. Which of the following individuals should receive PPV23?

- A. A healthy 72 year old without prior history of immunization with PPV23.
- B. A 32 year old with a cochlear implant.
- C. A 70 year old who received PPV23 at age 65.

- D. A 65 year old with diabetes who received PPV23 at age 58.
- E. A, B, and D.
- F. All of the above.

5. Which of the following is not a requirement of New York State Public Health Law §2112, effective July 1, 2008?

- A. For all vaccines except influenza, a trace amount of mercury is defined as 0.5 micrograms of mercury per 0.5 milliliter dose.
- B. Influenza vaccine that is given to pregnant women may contain no more than 1.25 micrograms of mercury per 0.5 milliliter dose.
- C. A pregnancy test must be performed prior to administering influenza vaccine or other vaccines that contain more than trace amounts of mercury.
- D. Vaccines containing more than trace amounts of mercury may not be given to children less than 3 years of age.
- E. A and B only.
- F. None of the above.

6. How well did this continuing education activity achieve its educational objectives?

- A. Very well.
- B. Adequately.
- C. Poorly.

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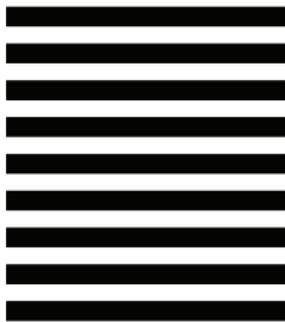
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INFLUENZA PREVENTION AND CONTROL: 2008-2009

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