Guidelines

for

Influenza Vaccination

By

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Setting Clinical and Professional Excellence

Influenza is associated with high rates of morbidity and mortality especially in high risk persons. Reducing the risk for influenza among persons at higher risk for complications is a major focus of influenza prevention strategies.

Persons at risk for medical complications attributable to sever influenza

Vaccination to prevent influenza is particularly important for persons who are at increased risk for severe complications from influenza, or at higher risk for influenza-related outpatient, ED, or hospital visits. When vaccine supply is limited, vaccination efforts should focus on delivering vaccination to the following persons:

- All children aged 6-59 months.
- All persons aged ≥50 years.
- Morbidly obese persons (BMI ≥40).
- Adults and children who have chronic pulmonary (including asthma) or cardiovascular (except isolated hypertension), renal, hepatic, neurologic, hematologic, or metabolic disorders (including diabetes mellitus).
- Immunosuppressed patients (including those caused by medications or by HIV infection).
- Pregnant women & early postpartum (delivered within previous 2 weeks).
- Children and adolescents (aged 6 months -18 years) who are receiving long-term aspirin therapy and who might be at risk for experiencing Reye's syndrome after influenza virus infection.
- Residents of nursing homes and other long-term care facilities.

Recommendations

Annual influenza vaccination is recommended for all persons aged ≥6 months who have no medical contraindication including all health care providers HCPs.

It is recommended that all children aged 6 months - 8 years who are being vaccinated for the first time should receive 2 vaccine doses separated by at least 4 weeks.

Adults aged ≥65 years typically have diminished immune responses to influenza vaccination compared with healthy younger adults but administration of additional vaccine doses during the same season does not increase the antibody response among elderly vaccinees.

The majority of adults have antibody protection against influenza virus infection within 2 weeks after vaccination. The protection against viruses that are antigenically similar to those contained in the vaccine extends at least for 6–8 months, particularly in non-elderly populations. In some situations, duration of immunity might be longer, and such effects can be detected if circulating influenza virus strains remain antigenically similar for multiple seasons.

Moderate or severe acute illness with or without fever & Guillain-Barré syndrome GBS within 6 weeks following a previous dose of influenza vaccine are considered a precaution for use of influenza vaccines.

Timing of vaccination: While delaying vaccination until later in the season might permit greater immunity later in the season, such deferral might result in missed opportunities to vaccinate, as well as difficulties in vaccinating a population within a more constrained time period. Community vaccination programs should balance maximizing likelihood of

persistence of vaccine-induced protection through the season with avoiding missed opportunities to vaccinate or vaccinating after influenza circulation occurs.
However; vaccination efforts should continue throughout the season, because the duration of the influenza season varies and influenza activity might not occur in certain communities until February or March. HCPs should offer influenza vaccine routinely, and organized vaccination campaigns should continue throughout the influenza season including after influenza activity has begun in the community. Vaccine administered in December or later, even if influenza activity has already begun, is likely to be beneficial in the majority of influenza seasons.

Types of influenza vaccines:
- Live Attenuated Influenza Vaccine LAIV (The Nasal Spray Flu Vaccine - trivalent & quadrivalent) is administered intranasally and is licensed for use in healthy non-pregnant persons aged 2-49 years.
- Inactivated Influenza Vaccine IIV (trivalent TIV & quadrivalent) is administered as an intramuscular injection and can be given to any person aged ≥6 months. For adults and older children, the deltoid is the preferred site. Infants and younger children should be vaccinated in the anterolateral thigh. An intradermally administered TIV is an alternative to other TIV preparations for persons aged 18-64 years.
- A recombinant hemagglutinin (HA) vaccine RIV3 is indicated for persons aged 18-49 years. RIV3, an egg-free vaccine, is now an option for vaccination of persons aged 18-49 years with egg allergy of any severity

While LAIV induces lower levels of serum antibodies compared with IIV, LAIV more effectively induces cellular immune responses than IIV but no significant clinical difference reported among the 2 vaccines though some reports claim superior efficacy of LAIV as compared with IIV among children.

Contraindications and precautions to the use of LAIV:
- Persons with a history of severe hypersensitivity reaction to any component of the vaccine or to a previous dose of any influenza vaccine.
- Children and adolescents receiving concomitant aspirin therapy.
- Children aged <2 years; & adults aged ≥50 years.
- Children aged 2-4 years with history of wheezy episode during the preceding 12 months.
- Patients with asthma.
- Children & adults with chronic pulmonary, cardiovascular (except isolated hypertension), renal, hepatic, neurologic/neuromuscular, hematologic, or metabolic disorders.
- Patients with immunosuppression (including those caused by medications or HIV).
- Pregnant women.

Vaccination of Health care providers HCPs:
HCPs are exposed to patients with influenza in the workplace and are thus at risk of occupationally acquired influenza and of transmitting influenza to patients and other HCPs; so preventing influenza among HCPs who might serve as sources of influenza virus transmission provides additional protection to patients at risk for influenza complications
Vaccination of HCPs can specifically benefit patients who cannot receive vaccination:
-infants aged <6 months
-patients with severe allergic reactions to prior influenza vaccination)
- patients who respond poorly to vaccination (aged ≥85 years, immune-compromised persons)
-persons for whom antiviral treatment is not applicable (persons with medical contraindication).
Use of LAIV for HCP who care for patients housed in protective inpatient environments has been a theoretic concern, but transmission of LAIV in health-care settings has not been reported. HCPs who receive LAIV should avoid providing care for severely immunosuppressed patients requiring a protected environment for 7 days after vaccination.
LAIV can be used for HCP who work in any setting except for:
1. HCP who care for severely immunocompromised hospitalized persons requiring care in a protective environment.
2. HCP who have themselves a condition that confers high risk for influenza complications.
3. Pregnant HCP.
4. HCP aged ≥50 years.
In the above conditions, HCP should receive IIV and not LAIV.

Influenza vaccines and use of influenza antiviral medications:
Antiviral drugs use for chemoprophylaxis or treatment of influenza is an adjunct to (but not a substitute for) vaccination. Administration of IIV to persons receiving influenza antiviral drugs for treatment or chemoprophylaxis is acceptable.
Because antiviral drugs reduce replication of influenza viruses, LAIV should not be administered until 48 hours after cessation of influenza antiviral therapy.
If influenza antiviral medications are administered within 2 weeks after receipt of LAIV, the LAIV dose should be repeated 48 or more hours after the last dose of antiviral medication.
Alternatively, persons receiving antiviral drugs within the period 2-14 days after vaccination with LAIV may be revaccinated with another formulation (IIV or RIV).
IIV can be administered to exposed, unvaccinated HCP at the same time as chemoprophylaxis, but LAIV should be avoided because the antiviral medication will prevent viral replication needed to stimulate a vaccine response.
Antivirals are used often among patients during outbreaks in closed settings such as long term care facilities & to unvaccinated HCP during outbreaks, when an exposure to a person with influenza occurs or after exposure when vaccination is not thought to be protective against the strain to which a vaccinated HCP was exposed.
Oseltamivir (orally) or zanamivir(inhalation) are recommended currently for chemoprophylaxis or treatment of influenza. Chemoprophylaxis consists of 1 dose (of either antiviral drug) daily for 10 days, and treatment consists of 1 dose twice daily for 5 days.

In many instances of HCPss exposure, watchful waiting and early initiation of treatment if symptoms appear is preferred rather than use of antiviral chemoprophylaxis immediately after exposure. The intensity and duration of the exposure and the underlying health status of the exposed worker are important factors in clinical judgments about whether to provide chemoprophylaxis.

Influenza Vaccination for Pregnant Women

- Pregnant and postpartum women are at higher risk for severe illness and complications from influenza than women who are not pregnant because of changes in the immune system, heart, and lungs during pregnancy.
- It is recommended that all women who are pregnant or who might be pregnant in the upcoming influenza season receive inactivated influenza vaccines IIV because of this increased risk for serious illness and complications from influenza. Influenza vaccination can be administered at any time during pregnancy, before and during the influenza season.
- IIV does not cause fetal harm when given to a pregnant woman *but data on the safety of influenza vaccination in the early first trimester are limited.*
- Pregnant women have protective levels of anti-influenza antibodies after vaccination. Passive transfer of anti-influenza antibodies that might provide protection from vaccinated women to neonates has been reported & maternal influenza vaccination during pregnancy is associated with increased antibody titers & significantly reduced risk for influenza virus infection and hospitalization for influenza-like illness among infants aged <6 months.
- Live attenuated influenza vaccine (LAIV) is not recommended for use during pregnancy but postpartum women can receive either LAIV or IIV.
- Pregnant and postpartum women do not need to avoid contact with persons recently vaccinated with LAIV.

Vaccination for allergic persons (especially those with egg allergy):

- Persons with a history of egg allergy who have experienced only hives after exposure to egg should receive influenza vaccine using IIV or RIV3. RIV3 is egg-free and may be used for persons aged 18–49 years who have no other contraindications. However, IIV (egg- or cell-culture based) also may be used, with the following additional safety measures:
    - Vaccine should be administered by a HCP who is familiar with the potential manifestations of egg allergy; and
    - Vaccine recipients should be observed for at least 30 minutes for signs of a reaction after administration of each vaccine dose.
- Measures, such as dividing and administering the vaccine by a two-step approach and skin testing with vaccine are not necessary.
- Persons who report having had reactions to egg involving such symptoms as angioedema, respiratory distress, lightheadedness, or recurrent emesis; or who required epinephrine or another emergency medical intervention, particularly those that occurred immediately or within a short time (minutes to hours) after egg exposure, are more likely to have a serious systemic or anaphylactic reaction upon re-exposure to egg proteins; these persons may receive RIV3, if aged 18-49 years and

there are no other contraindications.
If RIV3 is not available or the recipient is not within the indicated age range, such persons should be carefully evaluated for risk- benefit ratio of the vaccine.

- All vaccines should be administered in settings in which facilities for rapid recognition and treatment of anaphylaxis are available.
- A previous severe allergic reaction to influenza vaccine, regardless of the component suspected to be responsible for the reaction, is a contraindication to future receipt of any influenza vaccine.

Concurrent administration of influenza vaccine with other vaccines:
Use of LAIV3 concurrently with measles, mumps, rubella (MMR) and varicella vaccine among children aged 12-15 months showed no interference with the immunogenicity to antigens in any of the vaccines was observed.
Among adults aged ≥50 years, the safety and immunogenicity of zoster vaccine and IIV3 were similar whether administered simultaneously or sequentially spaced 4 weeks apart.
Inactivated vaccines do not interfere with the immune response to other inactivated vaccines or to live vaccines. Inactivated or live vaccines can be administered simultaneously with LAIV. However, after administration of LAIV; at least 4 weeks should pass before another live vaccine is administered.

Further reading
Influenza A and B are the two types of influenza viruses that cause epidemic human disease. Influenza A (H1N1) viruses, influenza A (H3N2) viruses, and influenza B viruses have co-circulated globally.
Antibody elicited by vaccination is generally strain-specific, such that antibody against one influenza virus type or subtype confers limited or no protection against another type or subtype, nor does it confer protection against antigenic variants of the same virus that arise by antigenic drift. Effectiveness of influenza vaccines varies from year to year and depends on the age and health status of the person getting the vaccine and the similarity or "match" between the viruses or virus in the vaccine and those in circulation. Vaccine strains are selected for inclusion in the influenza vaccine every year based on international surveillance and scientists' estimations about which types and strains of viruses will circulate in a given year. Annual vaccination is recommended because the predominant circulating influenza viruses typically change from season to season and, because immunity declines over time post-vaccination
Vaccinated persons have "antibody ceiling" effect in adult subjects with historic exposures to both natural infections and vaccination. This could result in the decreased likelihood that antibody increases can be observed in vaccinated subjects after influenza infection with circulating viruses, as compared with non vaccinated infected patients, thus, vaccinated subjects might be less likely to show a fourfold increase in antibody levels can after influenza infection with circulating viruses compared with unvaccinated subjects in such studies.

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