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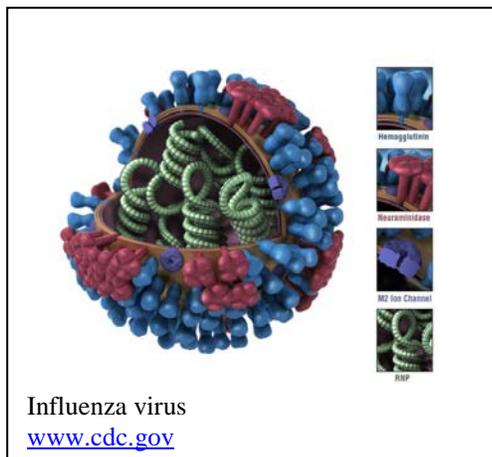
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Influenza Vaccine, 2014-2015 Season

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Influenza is a contagious respiratory infection that causes mild to severe illness. Annual vaccine is the major intervention to prevent the spread of influenza. Lack of vaccine effectiveness during an influenza season can increase associated morbidity and mortality.

Influenza Vaccine



Influenza A and B are the major human pathogens. The viruses are further characterized by the surface proteins, hemagglutinin (H1-H18) and neuraminidase (N1-N9). There are periodic major changes or shifts in the circulating influenza strains. Such a shift occurred in 2009 with a markedly different H1N1 influenza virus emerging. In addition, influenza viruses undergo constant smaller changes

(antigenic drift). The full designation of a strain also includes the lineage, year and location of first isolation. For example the current influenza vaccine includes A/Texas/50/2012 (H3N2)-like virus.

Vaccine is produced months before influenza season, with the selection in February of the specific viral strains to be included based on laboratory surveillance. The strains selected may be well-matched with circulating flu viruses, giving higher vaccine effectiveness. Even with a sub-optimal match, which can reduce the vaccine's effectiveness, there may be sufficient cross-protection from the antibodies to result in milder illness and fewer associated complications. However, with an antigenic shift the vaccine may offer poor protection for strains covered by that component.

There are several vaccine options available for the 2014-2015 influenza season. The trivalent vaccines are injectable, covering an influenza A 2009

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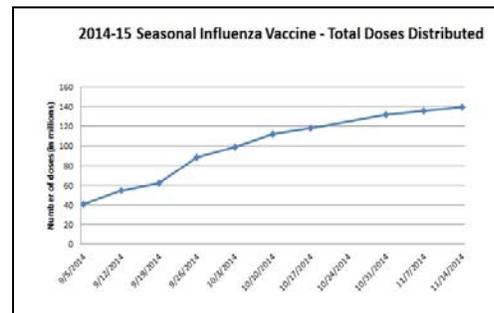
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H1N1 virus, an influenza A H3N2 virus and one influenza B virus. The quadrivalent vaccines are in either the injectable or the nasal spray form, covering A 2009 H1N1 virus, an A H3N2 virus and two B viruses. During the 2014-2015 season, about half of the total influenza vaccine supply will be trivalent and half will be quadrivalent.



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Nasal Vaccine Effectiveness

Beginning in 2008, the Advisory Committee on Immunization Practice (ACIP) and the Centers for Disease Control and Prevention (CDC) have recommended annual influenza vaccine for children 6 months and older (with rare exceptions). Children aged 6 months through 8 years require two doses of influenza vaccine (administered ≥ 4 weeks apart) during their first season of vaccination to optimize immune response. Beginning in the summer of 2014, ACIP and CDC recommended that beginning during the 2014-2015 influenza season, live attenuated influenza vaccine (LAIV, or the "nasal spray vaccine") should be used for healthy children 2 through 8 years of age when the vaccine is immediately available and when there are no contraindications or precautions against getting that vaccine.



LAIV had been shown to provide young children with better protection against influenza virus infection compared to injected vaccine. However, recently available CDC analyses of a study from the 2013-2014 season showed that LAIV had no measurable effectiveness against

influenza A H1N1 among children. The study did not have enough case patients infected with H3N2 or B viruses to calculate vaccine effectiveness against those viruses.

The same H1N1 vaccine virus from the 2013-2014 vaccine is included in the 2014-2015 vaccines so effectiveness of LAIV may again be limited for that strain. The nasal spray vaccine is still a recommended option for vaccination because LAIV protects against four different influenza viruses and would still protect against influenza A H3N2 and two influenza B viruses. Thus far in the 2014-

2015 influenza season there is substantially more circulation of influenza A H3N2 and B viruses and very little circulating H1N1. LAIV has previously been shown to offer good protection against influenza A H3N2 and influenza B viruses and may offer better protection than injected vaccine against antigenically drifted viruses that may circulate this season.

Children needing one dose of vaccine this season who received LAIV this year are considered fully vaccinated and do not need to be revaccinated. Children needing two doses of vaccine this season who have only gotten one previous dose can get either the nasal spray vaccine or the injected vaccine as their second dose, whatever is immediately available.

H3N2 Match

Although it is early in the season and data are limited, some of the influenza A (H3N2) viruses collected during ongoing routine laboratory surveillance were found to be antigenically different than the 2014-2015 H3N2 vaccine component. Based on the limited influenza A (H3N2) viruses collected in the United States since October 1, about 52% of isolates have been characterized as antigenically different from the vaccine strain, primarily the antigenic variant A/Switzerland/9715293/2013. This strain of influenza was first collected in March 2014, after the February selection of vaccine viruses for the Northern Hemisphere vaccine, but will be included in the Southern Hemisphere vaccine, which has its season opposite ours. Even with an antigenic mismatch, cross-protection can occur and reduce the complications of influenza.



Influenza seasons with H3N2 predominating tend to have more hospitalizations and more deaths. That makes prompt treatment of influenza particularly important this season. Based on the detection of H3N2 strains not in the vaccine, CDC issued a Health Advisory re-emphasizing the use of neuraminidase inhibitor antiviral medications (oseltamivir and zanamivir) when indicated for treatment and prevention of influenza. These medications reduce duration of illness, risk of complications, and for hospitalized patients the risk of death. Those at greatest risk of complications should be encouraged to seek medical care promptly if influenza-like illness develops, and even without laboratory confirmation antiviral treatment should be started for any patient with confirmed or suspected influenza who is hospitalized; has severe, complicated, or progressive illness; or is at higher risk for influenza complications. Providers should know that a negative rapid influenza diagnostic test (RIDT) does not rule out influenza in a patient with influenza-like illness, and to consider prompt antiviral treatment even with a negative RIDT in a patient at risk for severe influenza or its complications.

Preventing influenza takes three approaches: influenza vaccination for all persons 6 months and older; preventive practices such as respiratory hygiene (covering coughs, washing hands, and avoiding symptomatic persons) or social distancing (staying home when ill); and prompt antiviral treatment or prophylaxis as needed. Flu vaccination continues to offer the best protection against influenza infection, even when there are some antigenically drifted viruses circulating in the community.

Resources

CDC statement on LAIV effectiveness: <http://www.cdc.gov/flu/news/nasal-spray-effectiveness.htm>.

CDC weekly influenza summary: <http://www.cdc.gov/flu/weekly/summary.htm>

Supply of influenza vaccine:
<http://www.cdc.gov/flu/professionals/vaccination/vaccinesupply.htm>.

Use of antiviral medication: <http://www.cdc.gov/flu/professionals/antivirals/>