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Influenza Vaccination and Cancer

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What does the influenza vaccine protect against?

All influenza vaccines in 2015-2016 protect against the following three strains:

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
- B/Phuket/3073/2013-like virus. (This is a B/Yamagata lineage virus)

Vaccine types

IIV3 [Inactivated Influenza Vaccine, Trivalent]: (Afluria®, Fluvirin®, Fluzone® - Trivalent)

IIV3 [Inactivated Influenza Vaccine, Trivalent]: (Fluzone High-dose®)

- Recommended for patients ages 65 years and older. This vaccine contains a higher dose of antigen and helps an older person's body produce a stronger immune response to the vaccination.

RIV3 [Recombinant Influenza Vaccine, Trivalent]: (FluBlok®)

IIV4 [Inactivated Influenza Vaccine, Quadrivalent]: (Fluarix®, FluLaval®, Fluzone®)

- Also protects against B/Brisbane/60/2008-like virus

Cancer and influenza

According to the CDC, a patient living with cancer is at an increased risk from developing complications from influenza, which could lead to hospitalization and death. NCCN guidelines state that all patients aged greater than or equal to 6 months with malignancies should receive the inactivated influenza vaccine annually. The live virus is contraindicated. The only exception is if a patient is receiving anti-B-cell antibodies or intensive chemotherapy, such as for induction or consolidation for acute leukemia (2). It is also recommended that individuals ≥6 months who live with immunocompromised patients also receive the influenza vaccine annually (3).

Timing is important

The 2013 IDSA guidelines recommend that vaccines should be administered prior to planned immunosuppression such as chemotherapy if feasible (3). If a patient is already receiving chemotherapy, they should be vaccinated in between cycles of chemotherapy. Patients with neoplastic disease who were receiving intermittent chemotherapy were randomized to receive immunization at the time of administration of chemotherapy (schedule A) or at the time at which blood counts were at their nadir (schedule B). The average nadir blood counts were reached after chemotherapy administration in 7 days for patients on a 14-day cycle, in 10 days for those on a 21-day cycle, and in 14 days for those on a 28-day cycle (4).

Patients immunized on Schedule A showed a 4x or greater rise in antibody titer only 50% of the time, compared with a 93% response rate in those individuals immunized on Schedule B ($P < 0.01$). Post-immunization titers were also significantly lower in the patients immunized on Schedule A ($P < 0.05$). Analysis showed that in the entire patient population the only factor significantly associated with failure of seroconversion was receiving vaccination at the time of chemotherapy ($P < 0.05$).

If possible, It would be best to give the influenza vaccine >7 days after the last treatment or at least 2 weeks before the first treatment (3).

FluMist Quadrivalent - Live Vaccine

Patients receiving chemotherapy are considered to be immunocompromised and should not receive live attenuated vaccines like the FluMist intranasal vaccine. Patients should also be advised to avoid contact with someone who has received FluMist intranasal vaccine for at least 7 days after receipt of FluMist (1,3,5). Flumist should also be avoided in patients with asthma due to an increased risk of wheezing following administration (5).

Where can patients get the influenza vaccine?

Patients can receive their influenza vaccine during visits to the UConn Health Comprehensive Cancer Center. Pharmacists in the state of Connecticut are also licensed immunizers so patients have the option to go to their local pharmacy and get a vaccination at their convenience (6). Most copays for the influenza vaccine are $0.

Misconceptions about the influenza vaccine

- *"Can the flu shot give you the flu?"*
  - ◊ No, the inactivated influenza vaccines CANNOT cause the flu illness. The most common side effects are soreness, redness/tenderness, low-grade fever, headaches and muscle aches(1).
- *"I got the flu vaccine last year and I still got the flu!"*
  - ◊ Unfortunately the influenza vaccine is not 100% effective. Even if one does get the flu, their illness may be milder if they received the influenza vaccine(1).

References

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Pneumococcal Virus Vaccine Recommendations

Patients with hematological malignancies are at least 5x as likely to contract pneumococcal disease as their non-immunocompromised peers and should be vaccinated. Patients who have had stem cell transplants have especially rigorous vaccine requirements that are not included here.

Patients ≤19, with new diagnoses of either solid or hematologic malignancies, should receive pneumococcal vaccination, if not already vaccinated, at least 2 weeks prior to starting chemotherapy. The initial vaccine choice is dependent up on their age and previous immunization history.

If the patient has not already had any pneumococcal vaccine, he or she should be vaccinated with 13-valent pneumococcal conjugate vaccine (Prevnar 13) followed by 23-valent pneumococcal polysaccharide vaccine (Pneumovax 23) eight weeks or more after the initial vaccine. Five years later, a subsequent dose of 23-valent pneumococcal polysaccharide vaccine should be administered.

If the patient has already received a 23-valent pneumococcal polysaccharide vaccine in the past, and is over 65 years of age, he or she should be revaccinated with the 23-valent pneumococcal polysaccharide vaccine if the previous vaccine dose was at least 5 years prior.

Patients between 19 and 64, who have previously received a 23-valent pneumococcal polysaccharide vaccine at least 1 year in the past, should be revaccinated with pneumococcal 13, and if a subsequent dose of 23-valent pneumococcal polysaccharide vaccine is needed, it should be <8 weeks after pneumococcal 13 and <5 years after any previous 23-valent pneumococcal polysaccharide vaccine dose.

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http://www.nccn.org/professionals/physician_gls/pdf/infections.pdf. Accessed 11/9/15.