Immunization of healthcare personnel can increase safety and decrease costs

Personnel who contract vaccine-preventable illnesses not only expose vulnerable patients to diseases but also may miss work to care for themselves or sick relatives. Controlling outbreaks costs money and can drain hospitals of important resources.

In 1993, two pertussis outbreaks at Children’s Hospital Medical Center (Cincinnati, Ohio) cost $85,400 to control, and about half of that amount was used to fund a paid 5-day leave for the 79 employees with suspected pertussis. Other incurred costs included security staff to monitor the elevator to ensure compliance with the visitor restriction policy and temporary child care services for siblings of inpatients, who were among those restricted from visiting patients (Walker et al.; Christie et al.).

Vaccines have helped to eliminate or limit some very serious diseases in the United States and throughout the world. Various federal agencies and groups have recommended that healthcare personnel be immunized against specific illnesses because of the inherent risks for staff and patients.

Recommended immunizations

The Centers for Disease Control and Prevention’s (CDC) Advisory Committee on Immunization Practices (ACIP) recommends that healthcare personnel be vaccinated against or have evidence of immunity to measles, mumps, and rubella; tetanus, diphtheria, and pertussis; varicella; and seasonal flu. HBV vaccination is recommended for personnel who are at risk for exposure to blood or body fluids.

The Occupational Safety and Health Administration (OSHA) requires employers to make the HBV vaccine available to such employees. For certain other diseases (eg, meningococcal disease, typhoid fever, polio), ACIP recommends vaccination only for specific groups at high risk (ACIP).

In recent years, ACIP and the CDC’s Healthcare Infection Control Practices Advisory Committee have emphasized that the recommendations apply to all healthcare personnel—not just those with responsibility for direct patient care (ACIP).

Healthcare organizations should review the vaccination and immunity status of healthcare personnel upon hire and at least annually. Immunization records should be maintained for healthcare personnel. In the event of an outbreak, up-to-date, well-organized records can help the hospital identify susceptible personnel and take appropriate action (ACIP).

Seasonal flu

Some populations, such as adults age 65 and older, pregnant women, and young children, are more sensitive to influenza infection than the general population and may develop severe complications from the flu (CDC Epidemiology; CDC “Influenza Vaccine, Inactivated”). Vaccination is the most effective method of preventing influenza and its complications (Fiore et al.). The seasonal influenza vaccine is available as both an inactivated form and a live, attenuated form. The inactivated vaccine is administered via intramuscular injection, and the live, attenuated vaccine is given by nasal spray (CDC “Influenza Vaccine, Inactivated”).
The inactivated vaccine is recommended for anyone who comes in close contact with patients whose immune systems are so weak that they require care in a protected environment (e.g., a bone marrow transplant unit). Healthcare personnel who are in contact with people who have stronger immune systems can opt for the live, attenuated nasal spray. More precautions are associated with this form of the vaccine, however (CDC “Influenza Vaccine, Live”).

Severe reactions to the influenza vaccine are rare; however, people with egg allergies should not get it. Mild symptoms may occur within 1 to 2 days of receiving the inactivated vaccine (CDC “Influenza Vaccine, Inactivated”).

**Pertussis**
The beginning of a pertussis infection can mimic the common cold. However, after 1 or 2 weeks, a severe cough develops. Among infected children age 6 months or younger, nearly 12% get pneumonia; 83% of pertussis deaths occur in infants age 3 months or younger (CDC Epidemiology). Apnea, encephalopathy, and death may also occur (Sandora et al.).

A pertussis vaccine has been available since the 1940s, and at least 95% of US children between the ages of 19 and 35 months are vaccinated against this illness (Sandora et al.; CDC “National”). However, reported cases in the United States have increased steadily from a historic low of 1,010 in 1976 to a high of 27,550 cases in 2010 (CDC “Pertussis—United States”; CDC “Pertussis”).

**Hepatitis B virus**
Although most adults who become infected with HBV recover completely, people who become chronically infected may eventually develop serious health problems, including liver damage, liver cancer, or death. Most people with chronic HBV infection are asymptomatic and can remain so for 20 to 30 years (CDC “Hepatitis B Information”).

Potential modes of transmission include percutaneous injury and contact between infective material and nonintact skin or mucous membranes (CDC Epidemiology). Without immunity to HBV, the risk of contracting the disease if exposed to infected blood from a single needlestick or cut ranges from 6% to 30% and depends on the hepatitis B e-antigen status of the source individual (CDC “Exposure”).

HBV vaccination is recommended for healthcare personnel who are at risk for exposure to blood or body fluids. For personnel at high risk for occupational percutaneous or mucosal exposure, testing for immune response should be performed 1 to 2 months after the last dose, and revaccination and retesting should be performed as necessary (ACIP).

**Measles, mumps, and rubella**
Measles is another virus-caused respiratory disease. Early symptoms include fever, cough, runny nose, and conjunctivitis; a rash develops 7 to 18 days after exposure (CDC Epidemiology). Pregnant women who get measles may have a miscarriage, give birth prematurely, or have a baby with a low birth weight (CDC “Measles”).

Mumps is transmitted through respiratory droplets. Most people who become infected with mumps recover; however, some complications have been known to occur, including inflammation of the testicles, the brain or tissue covering the brain and spinal cord, the ovaries, or the breasts. Temporary or permanent deafness may also occur (CDC “Mumps”).

Rubella is also transmitted through the respiratory system. Although symptoms are usually mild and complications are uncommon, infection during pregnancy is a
Varicella

Varicella, or chickenpox, is a highly contagious disease that causes an itchy rash of blister-like lesions. Healthy children may experience a mild form of the illness with malaise, itching, and a fever for 2 to 3 days. A recurrent infection, called herpes zoster or “shingles,” may have more severe symptoms. Potential complications of varicella include bacterial infection of the skin, pneumonia, and central nervous system manifestations (e.g., aseptic meningitis, encephalitis) (CDC Epidemiology).

This vaccine has been recommended for healthcare personnel who are not already immune to the disease. Before the vaccine was licensed in 1995, varicella was endemic in the United States. Vaccination coverage has decreased the incidence of this illness by 83% to 93% in studied areas. The vaccine effectiveness ranges between 72% and 85%, and immunity is most likely permanent (CDC Epidemiology).

Standards and guidelines

Federal regulations. In addition to ACIP and OSHA’s above recommendations, the US Food and Drug Administration has urged healthcare organizations to ensure that flu vaccination programs are available for all personnel (US Food and Drug Administration).

Joint Commission. Standard IC.02.04.01 specifically requires hospitals to offer flu vaccination to licensed independent practitioners and staff (Joint Commission).

Professional associations. Many professional associations and other organizations have discussed the importance of healthcare personnel immunization, especially against seasonal influenza. The Society for Healthcare Epidemiology of America supports requiring annual flu vaccination as a condition of employment or privileges for all staff—even students, volunteers, contractors, and those who do not have direct contact with patients (Talbot et al.).

The American Hospital Association, the Association for Professionals in Infection Control and Epidemiology, and the National Patient Safety Foundation have also issued policies or statements supporting mandatory flu vaccination for healthcare personnel as a condition of employment (American Hospital Association). However, some other organizations, including the American Nurses Association and the SEIU Nurse Alliance, support flu vaccination of healthcare personnel but oppose requiring it as a condition of employment (Wood).

Flu vaccination rates among healthcare personnel

Despite the importance of healthcare personnel immunization, participation in flu vaccination programs varies. During the 2010 to 2011 flu season, 71% of healthcare personnel who worked in hospitals said they had been vaccinated. Vaccination rates were lower among those who worked in long-term care facilities (64%), ambulatory or outpatient settings (61%), and home health (54%). Across all healthcare settings, vaccination rates varied by occupation: 84% among physicians and dentists, 70% among nurses, and 57% among administrative personnel (CDC “Influenza Vaccination Coverage”). (See sidebar, p 28.)

In the 2011 to 2012 flu season, two web-based surveys conducted by CDC in mid-November 2011 identified reasons healthcare personnel do or do not get vaccinated against seasonal flu. Additional studies have identified other common reasons for declining the seasonal flu vaccine, including fear of reaction, lack of concern, doubts
of the vaccine’s efficacy, and belief that they are not at risk (Hollmeyer et al.).

Vaccines are a valuable tool to help staff members prevent the exposure of patients to harmful illnesses. Healthcare organizations should take steps to ensure not only that staff members’ vaccinations are up to date, but that their vaccination programs are designed to help staff understand the benefits of annual immunization.

References


Centers for Disease Control and Prevention.


Promoting flu vaccination

Recommendations by the Centers for Disease Control and Prevention’s Healthcare Infection Control Practices Advisory Committee and Advisory Committee on Immunization Practices for flu vaccination of staff include the following:
• Educate personnel.
• Offer the flu vaccine annually to all eligible healthcare personnel.
• Offer the vaccine at the worksite and at no cost.
• Obtain a signed declination form from personnel who decline flu vaccination for reasons other than medical contraindications.
• Monitor flu vaccination coverage and declination among personnel at regular intervals during flu season, and provide feedback to staff and leadership.
• Use rates of flu vaccination coverage among healthcare personnel as one measure of a patient safety and quality program.

Vaccination of senior leaders is one strategy that has been associated with higher vaccination rates as well. Mandating annual seasonal flu vaccination as a condition of employment or privileges can help achieve high flu vaccination rates, though it is still controversial.


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