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APIC Practice Guidance Committee: Implementation Insights
Prevention & Control of Pertussis

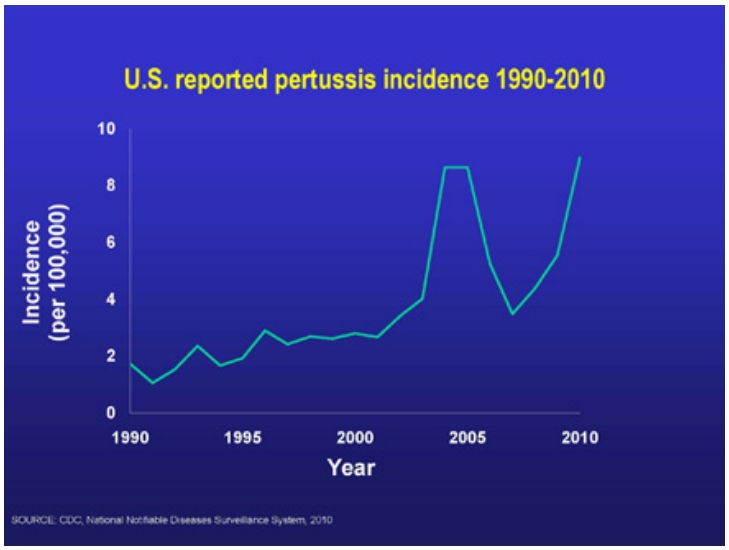
Overview of 2011 Update on Recommendations for Healthcare Personnel (HCP) Following Exposure to Laboratory-Confirmed Pertussis

2012 Updated Recommendations for Tdap in Adults aged 65 years and older

Background

Transmission of *Bordetella pertussis* occurs by direct contact with respiratory secretions or large aerosolized droplets from the respiratory tract of infected persons. The incubation period is generally 7–10 days but can be as long as 21 days. The period of communicability starts with the onset of the catarrhal stage and extends into the paroxysmal stage. Symptoms of early pertussis (catarrhal phase) are indistinguishable from other respiratory tract infections.

The CDC characterizes pertussis as an endemic disease in the United States, with periodic epidemics every 3 to 5 years and frequent outbreaks. In 2010, reported pertussis cases exceeded 27,000. This is considered the tip of the iceberg, with many more cases of pertussis not reported to public health. Most recently (April 3, 2012) the Washington State Secretary of Health declared a pertussis epidemic indicating the epidemiology of this disease continues to evolve.[1]



This graph shows incidence per 100,000 persons of reported pertussis in the United States from 1990-2010. The overall incidence of pertussis has been increasing steadily since 2007 and has now surpassed peak rates observed during 2004-2005. http://www.cdc.gov/pertussis/surv-reporting.html

Since the introduction of adult pertussis vaccination (Tdap) in 2005, there have been questions regarding pertussis exposure follow-up in the vaccinated, unprotected HCP (i.e., HCP in close

contact with a patient with pertussis without wearing a mask or respirator). The December 2006 ACIP vaccination publication (MMWR / 55(RR17);1-33 December 15, 2006) had recommended that until research and expert consensus on the most effective approach for the exposed vaccinated HCP was available, health-care facilities should continue post exposure antibiotic prophylaxis for vaccinated HCP who have unprotected exposure to pertussis. The purpose of this overview is to describe the results of the Advisory Committee on Immunization Practices (ACIP) published in the November 2011 report on healthcare worker pertussis immunization and exposure follow-up consideration.

The following is taken from the November 2011 ACIP report "Immunization of health-care personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP)"
Executive Summary: *"This report updates the previously published summary of recommendations for vaccinating health-care personnel (HCP) in the United States (CDC. Immunization of health-care workers: recommendations of the Advisory Committee on Immunization Practices [ACIP] and the Hospital Infection Control Practices Advisory Committee [HICPAC]. MMWR 1997;46 [No. RR-18]). This report was reviewed by and includes input from the Healthcare (formerly Hospital) Infection Control Practices Advisory Committee. These updated recommendations can assist hospital administrators, infection-control practitioners, employee health clinicians, and HCP in optimizing infection prevention and control programs. The recommendations for vaccinating HCP are presented by disease in two categories: 1) those diseases for which vaccination or documentation of immunity is recommended because of risks to HCP in their work settings for acquiring disease or transmitting to patients and 2) those for which vaccination might be indicated in certain circumstances. Background information for each vaccine-preventable disease and specific recommendations for use of each vaccine are presented. Certain infection-control measures that relate to vaccination also are included in this report. In addition, ACIP recommendations for the remaining vaccines that are recommended for certain or all adults are summarized, as are considerations for catch-up and travel vaccinations and for work restrictions. This report summarizes all current ACIP recommendations for vaccination of HCP and does not contain any new recommendations or policies.*

The recommendations provided in this report apply, but are not limited, to HCP in acute-care hospitals; long-term--care facilities (e.g., nursing homes and skilled nursing facilities); physician's offices; rehabilitation centers; urgent care centers, and outpatient clinics as well as to persons who provide home health care and emergency medical services."

Recommendations from CDC/ACIP 2011 Update

Recent published studies were taken into consideration by ACIP when revising guidance on healthcare personnel immunizations.[2-4]

Summary of Main Changes for Immunization Against Pertussis (Tdap):

- HCP, regardless of age, should receive a single dose tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis (Tdap) vaccine as soon as feasible if they have not previously received Tdap.
- The minimal interval was removed between vaccinations. Tdap can now be administered regardless of interval since the last tetanus or diphtheria-containing vaccine.
- Hospitals and ambulatory-care facilities should provide Tdap for HCP and use approaches that maximize vaccination rates.

Key Points From CDC/ACIP 2011 Update Section on Pertussis Vaccination[2]

1. Regardless of age, HCP should receive a single dose of Tdap if they have not previously received Tdap and regardless of the time since their most recent Td vaccination. There is currently no recommendation for a booster of a prior Tdap administration.
2. Because Tdap coverage is suboptimal among HCP, and the duration of protection afforded by Tdap is unknown, vaccination status does not change the approach to evaluate for post exposure antibiotic prophylaxis necessity of exposed HCP.
3. Tdap might not preclude the need for antibiotic post exposure prophylaxis. Therefore post exposure antibiotic prophylaxis is indicated for all HCP (unvaccinated and vaccinated) in contact with persons at risk for severe disease (e.g. hospitalized neonates and pregnant women). Other HCP either should receive post exposure antibiotic prophylaxis or be monitored for 21 days after pertussis exposure and treated at the onset of signs and symptoms of pertussis.
4. Recommended post exposure prophylaxis antibiotics for HCP exposed to pertussis include azithromycin, clarithroymycin, or erythromycin. Trimethoprim-sulfamethoxazole can be used to provide antibiotic prophylaxis in HCP allergic to or intolerant of macrolides.
5. Prevaccination serologic testing is not recommended.
6. Immunity cannot be demonstrated through serologic testing because serologic correlates of protection are not well established.
7. Tdap is not licensed for multiple administrations.

TABLE 5. Advisory Committee on Immunization Practices work restrictions for health-care personnel* (HCP) exposed to or infected with certain vaccine-preventable diseases and conditions

Immunization of Health-Care Personnel: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR.* 2011;60(RR07):1-45

Pertussis;	**Work Restriction**	**Duration**
Active	Exclude from duty	Beginning of catarrhal stage through third week after onset of paroxysms or until 5 days after start of effective antimicrobial therapy
Postexposure		
Symptomatic personnel	Exclude from duty	5 days after start of effective antimicrobial therapy
Asymptomatic personnel HCP likely to expose a patient at risk for severe pertussiss	No restriction from duty; on antimicrobial prophylactic therapy	
Asymptomatic	No restriction from duty; can receive postexposure prophylaxis *or* be	

personnel -- other HCP	monitored for 21 days after pertussis exposure and treated at the onset of signs and symptoms of pertussis	

§ Includes hospitalized neonates and pregnant women.

Key points and Guidance for Use from June 29 2012 CDC/ACIP Updated Recommendations for Tdap in Adults aged 65 years and older[2]

Tdap use in adults. ACIP recommends that all adults aged 19 years and older who have not yet received a dose of Tdap should receive a single dose. Tdap should be administered regardless of interval since last tetanus or diphtheria toxoid-containing vaccine. Tdap should not be administered to persons with a medical contra-indication (see ACIP Vaccine Information Statements (VIS) for list of contra-indications)

Tdap products in adults aged 65 years and older. Providers should not miss an opportunity to vaccinate persons aged 65 years and older with Tdap. When feasible, Boostrix should be used for adults aged 65 years and older; however, ACIP concluded that either vaccine administered to a person 65 years or older is immunogenic and would provide protection. A dose of either vaccine may be considered valid.

APIC Recommendation

1. Infection Preventionists should review the 2011 ACIP recommendations with Personnel (Occupational) Health Services (PHS) in their organizations and develop or update pertussis vaccination policy and post-exposure follow-up plan in accordance with these recommendations. Tdap status should be obtained by occupational health at the start of employment for all new hires/students and for current employees at their yearly review (vaccination status should ideally be recorded and available via an electronic database). It is important to identify Tdap vaccination status of exposed personnel as part of the post exposure follow-up. This will facilitate efforts to obtain high levels of protection against pertussis from receipt of Tdap vaccination among personnel.

2. Infection Preventionists should work with PHS to develop plans for appropriate follow-up of possible occupational exposure to pertussis involving both vaccinated and unvaccinated HCP.
    a. For exposed staff who are asymptomatic and who work with high risk patients, including neonates and pregnant women, provide appropriate antimicrobial prophylactic therapy regardless of vaccination status.
    b. HCP who refuse antibiotic prophylaxis and work with high risk patients should either have their duties altered so as to work with lower risk patients or be furloughed for 21 days following last exposure.
    c. For exposed staff who are asymptomatic and DO NOT work with high risk patients, have a plan detailing how HCP who refuse prophylaxis will be monitored for symptoms during the incubation period. Note: all exposed HCP should be offered prophylaxis regardless of their duties or patient populations.

d. Health-care facilities may elect to implement a policy of furlough for all exposed HCP who refuse post-exposure prophylaxis. Underlying rationale is that symptoms of acute pertussis infection are non-specific, e.g. can mimic other upper respiratory infections caused by cold viruses or hard to distinguish from symptoms from non-infectious causes like underlying asthma or those with chronic cough due to active or history of smoking. This lack of precision may therefore lead to healthcare associated transmission of pertussis from infected HCP.

3. Infection Preventionists should work with PHS to develop a HCP monitoring plan when post-exposure pertussis symptom-watch is recommended for the identified pertussis incubation period. Different monitoring options that have been used with success in some facilities include:
    a. an "honor system" approach with written instructions for self-monitoring coupled with a requirement for contact with PHS if symptoms develop
    b. a daily symptom check-in with PHS or designee in person
    c. a daily symptom check-in with PHS or designee by phone notification

4. HCP who develop signs and symptoms of pertussis, either following possible occupational exposure or exposure in the community, should be removed from duty and tested for acute pertussis. If confirmed, HCP with pertussis should be treated appropriately and should NOT be allowed to work even if they agree to wear a mask. See recommendations in Table 5from the MMWR (above) regarding duration of work exclusion.

5. Infection Preventionists should collaborate with PHS in the evaluating the findings of ongoing pertussis surveillance and as part of the annual Infection Prevention Risk Assessment.
    a. Surveillance findings of increased pertussis disease in exposed personnel must trigger an assessment of effectiveness of exposure follow-up compliance with recommended prophylaxis and symptom watch.
    b. Increased pertussis disease in HCP may be related to increased prevalence of pertussis in the community. Efforts to increase HCP compliance with vaccination, if not a facility mandated initiative, must be taken.
    c. Ineffective processes and/or suboptimal compliance should be acted on immediately to prevent further post-exposure pertussis episodes.
6. APIC supports the recommendation to provide Tdap vaccination for all HCP, and encourages facilities that have not mandated Tdap as a condition of employment to use a pertussis exposure as an opportunity to provide unvaccinated employees with the opportunity to receive Tdap vaccination.

Recent Research and Published Studies:

There are studies demonstrating that Tdap can be effective for at mitigating infection after exposure. The first investigation by Wei and colleagues determined efficacy of vaccine was

65.6% comparing incidence of secondary cases in a community wide outbreak involving pre-school and school-aged children.[4] Another more recent investigation involved randomization of HCP with history of receipt of Tdap to post exposure prophylaxis (PEP) using an antibiotic vs. no antibiotic.[5] There was no statistical inferiority of subjects who had Tdap without use of PEP antibiotics compared to those who did receive PEP. The sample size was limited however, 86 subjects, and the authors called for additional investigations of a strategy that relies solely immunity. APIC recommends its members review these studies with their Occupational Health colleagues when updating or developing post exposure policies at their affiliates.

There has been documented success by organizations that mandate Tdap as a condition of employment. This is a promising addition to organizational strategies regarding pertussis risk of HCP who are exposed in the workplace or the community.[6]

References

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7. Td or Tdap Vaccine VACCINE INFORMATION STATEMENT http://www.cdc.gov/vaccines/pubs/vis/default.htm

August 14, 2012