

A healthcare worker with pertussis:

Healthcare organizations must continue to find ways to educate healthcare workers on the need to protect patients and the community from pertussis —or pay the price.

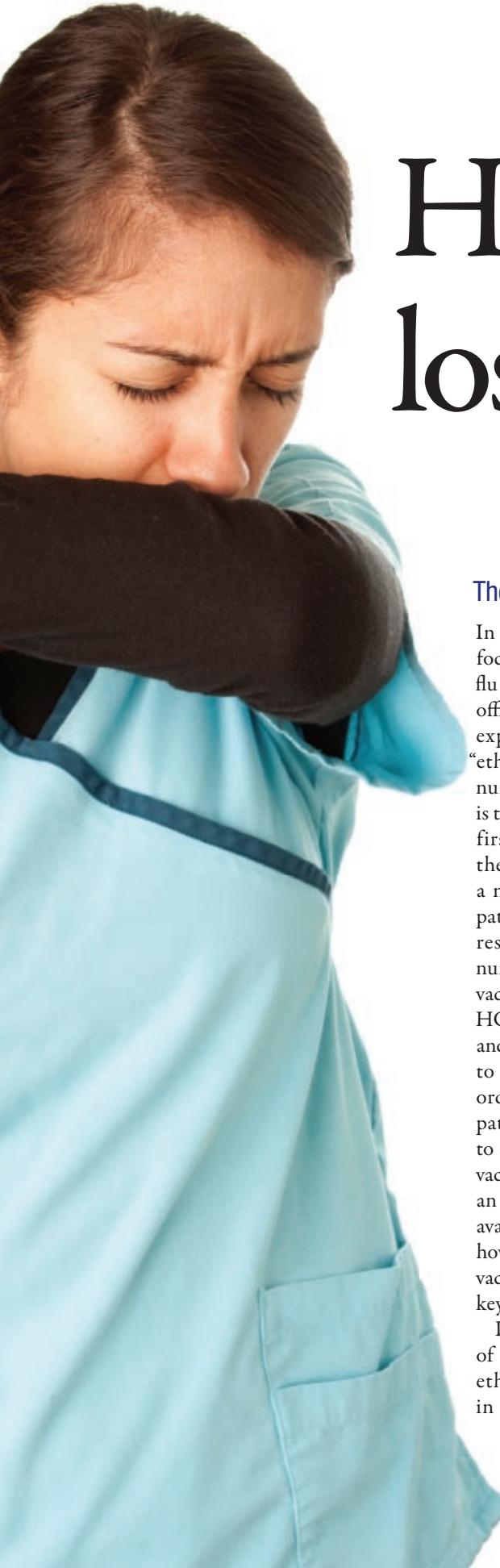
BY GREGORY GAGLIANO, BSN, RN, CIC*

In December 2010 at the Cleveland Clinic Children's Hospital, an unvaccinated pediatric hospital healthcare provider with a 22-day history of a cough atypical of the barky, whooping kind associated with the disease, was diagnosed with pertussis. The employee worked on four pediatric units, and exposed 23 pediatric hematology-oncology patients, 31 additional infants and children, and 92 co-workers.

The Occupational Health department at the Cleveland Clinic has a robust vaccination program and vaccinations are available to all healthcare personnel (HCP). However, after checking, it was found that only 43 percent of the exposed HCP (40 of 92) had accepted a Tdap immunization. In hopes of stopping any potential secondary cases, fast action was taken. All exposed and non-exposed HCP were again offered a Tdap vaccine, if not up to date. Of the exposed under-immunized HCP, only 25 percent (13 of 52) agreed to receive a Tdap vaccination. But before going into the details of the exposure, it's important to understand the barriers to HCP vaccination.

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High cost and lost opportunity

The vaccination controversy

In a February 2012 *PBS NewsHour* article focusing on the issue of mandatory HCP flu vaccinations, Amy Garcia, chief nursing officer for the American Nurses Association, explained that HCP vaccination is an "ethical responsibility." She said, "Part of nursing's code of ethics is that the patient comes first. So we believe if there is a chance that a nurse could expose a patient, it is the ethical responsibility of the nurse to be protected by vaccinations."¹ Although HCP have a professional and ethical responsibility to get vaccinations in order to protect their patients, getting them to accept recommended vaccinations can be quite an undertaking. The vaccines may be readily available, and may be offered free of charge; however, the perceived benefits or harms of vaccination start early in life and may play a key role in saying yes or no to a vaccine.

Disagreements over the safety and efficacy of particular vaccines, as well as personal ethical objections, lead to differences in opinion about the necessity of HCP

vaccination. Vaccine proponents generally believe the scientific evidence on safety of vaccines, combined with the need to protect the safety of patients and the public health is clear. Thus, they believe all HCP should receive all recommended vaccines.

The cost of post-exposure investigation, prophylaxis, lost work, and physician referral was estimated at \$12,065. The hospital cost to vaccinate the index HCP would have been \$30.

of the vaccine issue, during certain stages of the illness, you may be contagious and pass the disease to family members, friends, and others who come into contact with you.²

However, vaccine opponents often feel the science on the safety of vaccines is less clear and/or they may believe the ethical imperative to allow individual employees to make their own healthcare decisions trumps



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Access peer-reviewed articles about pertussis in the *American Journal of Infection Control*:

Judith A. Guzman-Cottrill, Carrie A. Phillipi, Susan A. Dolan, Ann-Christine Nyquist, Amy Win, Jane Siegel. Free vaccine programs to cocoon high-risk infants and children against influenza and pertussis. November 2012 (volume 40 issue 9)

Gregory A. Poland, Robert M. Jacobson, Thomas Boyce. Health care worker pertussis immunization requirements and patient safety. August 2008 (volume 36 issue 6 Pages 390-391 DOI: 10.1016/j.ajic.2008.02.001)

Archana Chatterjee, Sharon Plummer, Brenda Heybrock, Tami Bardon, Kay Eischen, Mel Hall, Steven Lazoritz. A modified "cover your cough" campaign prevents exposures of employees to pertussis at a children's hospital. September 2007 (volume 35 issue 7 Pages 489-491 DOI: 10.1016/j.ajic.2007.02.008)

Peter Vranken, Michelle Pogue, Christine Romalewski, Raoult Ratard. Outbreak of pertussis in a neonatal intensive care unit—Louisiana, 2004. November 2006 (volume 34 issue 9 Pages 550-554 DOI: 10.1016/j.ajic.2006.01.008)

patient safety and public health concerns. Research has shown that HCP who do not get vaccinated often fail to recognize the severity of the illness and that they are at increased risk of exposure to infection and may transmit infection to vulnerable patients; in addition, many are fearful of adverse effects from the vaccine and question the effectiveness of vaccines.⁴ For example, rumors have surfaced that vaccines contain poisonous substances such as lead, antifreeze, mercury, acetone, and formaldehyde, which have been shown to cause cancer.² This misinformation may come from a variety of sources such as sensationalized media, celebrity opinion, or Internet search results which have no data to support what is said and therefore, no basis in truth. The Centers for Disease Control and Prevention (CDC.gov) website is a recommended source for accurate and true information regarding vaccines as well as other health-related questions.

The pertussis exposure

In the case of the Cleveland Clinic Children's Hospital, because a healthcare provider opted out of a vaccine, patients and

HCP were exposed to pertussis. Prophylactic azithromycin was administered to exposed and still-hospitalized patients ($n=14$) and to all exposed hematology-oncology patients ($n=23$). Screening and/or treatment of discharged patients ($n=17$) was arranged through primary physicians. Exposed HCP were provided prophylaxis ($n = 79$) or were referred to their physician for prophylaxis ($n = 13$). Nine symptomatic HCP were furloughed and tested for pertussis by Polymerase Chain Reaction.

No secondary cases were confirmed among either exposed patients or co-workers. The cost of post-exposure investigation, prophylaxis, lost work, and physician referral was estimated at \$12,065, based on the following data: 116 courses of antibiotics (\$348); nine pertussis tests (\$857); staff time devoted to the outbreak response and screening (\$1,560); 240 hours of lost work (\$7,200); and 23 physician referrals (\$2,100). The hospital cost to vaccinate the index HCP would have been \$30. The cost to vaccinate all 92 exposed HCP would have been \$2,760. The amount spent on reactive infection prevention measures would have been sufficient to vaccinate 402 HCP. Keep in mind that the vaccine is offered to HCP at our hospital on



a continual basis and is readily available by simply visiting Occupational Health.

The incident at our healthcare organization corresponds to the findings of similar research on the cost-benefit analysis of pertussis infection prevention among HCP. In a study that tracked 1,000 HCP over 10 years, it was determined that the cost of infection control would be \$388,000 without Tdap vaccination for HCP compared with \$69,000 with a Tdap vaccination program.³ The study concluded that introducing a vaccination program would result in a net savings as high as \$335,000 and a benefit-cost ratio of 2.38; in other words, for every dollar spent on a Tdap vaccination program, \$2.38 would be saved on control measures.⁵

As indicated earlier, there are a number of reasons why HCP may choose to decline, rather than protect themselves and their patients from vaccine-preventable illnesses. This case illustrates the important benefit

of minimizing the need for post-exposure prophylaxis.⁶ Cleveland Clinic Health System requires immunity to certain communicable illnesses as a condition of employment, such as hepatitis, varicella, measles, mumps, and rubella, and is in the process of evaluating others such as influenza and now, pertussis.

Controversy will remain where HCP vaccination is concerned and issues of safety, efficacy, and ethics will likely continue

to play out in many healthcare facilities. However, as long as vaccine rates continue to fall short and the corresponding opportunity for preventing illness and disease is lost, healthcare organizations must continue to find ways to educate healthcare workers on the need to protect patients and the community. **P**

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References:

1. PBS NewsHour, February 6, 2012. "Next Health Care Mandate: Flu Shots for Medical Workers." Available at: <http://www.pbs.org/newshour/rundown/2012/02/next-government-mandate-flu-shots.html> Accessed September 20, 2012.
2. FORBES Magazine, March 14, 2012, "Vaccine Debate Acknowledged, Explained at Global Conference". Accessed September 8, 2012.
3. F Zhou *et al.* Economic Evaluation of the 7-Vaccine Routine Childhood Immunization Schedule in the United States. Available at: <http://www.niaid.nih.gov/topics/vaccines/understanding/pages/vaccinebenefits.aspx>. Accessed September 9, 2012.
4. Goins WP, Schaffner W, Edwards KM, Talbot TR. Healthcare Workers' Knowledge and Attitudes About Pertussis and Pertussis Vaccination. *Infection Control and Hospital Epidemiology* 2007; 28(11):1284-1289.
5. Calugari A, Ortega-Sánchez IR, Tiwari T, Oakes L, Jahre JA, Murphy TV. Nosocomial pertussis: costs of an outbreak and benefits of vaccinating health care workers. *Clin Infect Dis* 2006;42:981-8.
6. William P. Goins, *et al.* A Comparison of 2 Strategies to Prevent Infection Following Pertussis Exposure in Vaccinated Healthcare Personnel. *Clinical Infectious Diseases* 2012; 54 (7): 938-45. Accessed September 13, 2012.



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