Respiratory Protection for Healthcare Workers in the Workplace Against Novel H1N1 Influenza A: A Letter Report

The risk of influenza to healthcare workers is not a new concern, but the ongoing experience with novel influenza A (nH1N1) makes this issue even more urgent. Among the many considerations for the health and well-being of healthcare workers is the question about what types of personal protective equipment (PPE) (respiratory protection, gloves, gowns, eye protection, and other equipment) are needed to protect these frontline workers. PPE needs to be regarded one part of a set of infection control strategies to reduce the potential for infection in healthcare workers. At the request of the Centers for Disease Control and Prevention (CDC) and the Occupational Safety and Health Administration (OSHA) the Institute of Medicine convened the Committee on Respiratory Protection for Healthcare Workers in the Workplace Against Novel H1N1 Influenza A to provide recommendations regarding the necessary respiratory protection for healthcare workers in their workplace against novel H1N1 influenza A.

RESPIRATORY PROTECTION

The committee focused solely on the scientific and empirical evidence regarding the efficacy of various types of personal respiratory protective equipment (e.g., medical masks and respirators). Studies on influenza transmission show that airborne (inhalation) transmission is one of the potential routes of transmission. N95 respirators are documented to filter out 95 to 99 percent of relevant particles and have maximum effectiveness when properly fitted to the face of users. Research results on the filtration and fit of medical masks show wide variation in penetration of aerosol particles and inadequate fit suggesting that the use of medical masks is unlikely to be effective against airborne transmission.

RECOMMENDATION 1: USE FIT-TESTED N95 RESPIRATORS

Healthcare workers (including those in non-hospital settings) who are in close contact with individuals with nH1N1 influenza or influenza-like illnesses should use fit-tested N95 respirators or respirators that are demonstrably more effective as one measure in the continuum of safety and infection control efforts to reduce the risk of infection.

• The committee endorses the current CDC guidelines and recommends that these guidelines should be continued until or unless further evidence can be provided to the effect that other forms of protection or other guidelines are equally or more effective.

• Employers should ensure that the use and fit testing of N95 respirators be conducted in accordance with OSHA regulations, and healthcare workers should use the equipment as required by regulations and employer policies.

It is important to note that controversy exists regarding clinical guideline decision making as many factors besides efficacy may affect policy decisions for PPE guidance including economics, equipment supplies, vaccine availability, immunization status, extent of worker compliance, and logistical considerations in the implementation of such guidance. The committee was not charged to address these other issues.
FUTURE RESEARCH

It is still unclear what proportion of the spread of influenza virus occurs through each of the potential routes of transmission (contact, droplet spray, and airborne), as well as the role of respiratory protection devices for each of these modes of transmission. The determination of the relative contribution of each mode of transmission is essential for long-term preparedness planning. Secondly, a stronger evidence base is needed regarding the effectiveness of personal respiratory protection technologies in a variety of clinical settings. While some data are available, more research is needed to understand the clinical implementation of efficacious technologies, such as how compliance with various technologies can affect their use. Finally, continued collaboration and integration between the relevant agencies (e.g., FDA, CDC) are essential to assure the clinical implementation of newer technologies that are both efficacious as well as effective in the clinical setting.

RECOMMENDATION 2: INCREASE RESEARCH ON INFLUENZA TRANSMISSION AND PERSONAL RESPIRATORY PROTECTION

CDC centers (e.g., National Institute for Occupational Safety and Health; National Center for Immunization and Respiratory Diseases; National Center for Preparedness, Detection, and Control of Infectious Diseases), the National Institutes of Health, and other relevant federal agencies and private institutions should fund and undertake additional research to
• resolve the unanswered questions regarding the relative contribution of various routes of influenza transmission;
• fully explore the effectiveness of personal respiratory protection technologies in a variety of clinical settings through randomized clinical trials; and
• design and develop the next generation of personal respiratory protection technologies for healthcare workers to enhance safety, comfort, and ability to perform work-related tasks.

In the continuum of safety and infection prevention efforts in healthcare facilities, PPE is one of many important components. PPE includes respirators, gowns, gloves, eye protection, and hearing protection. Occupational safety and health measures have traditionally followed a hierarchy of controls—engineering controls, administrative and work practice controls, and PPE. During its workshop, the committee heard about many potential environmental and administrative controls that could be effective in reducing the number of healthcare workers exposed to nH1N1. These would include such activities as innovative triage mechanisms for individuals with influenza-like illnesses, separate waiting areas for such patients, and single patient rooms. The 2008 IOM report Preparing for an Influenza Pandemic: Personal Protective Equipment for Healthcare Workers, also examines the research needs in PPE and recognized the many issues that need to be addressed to improve PPE use in an influenza pandemic.

FOR MORE INFORMATION . . .

Copies of Respiratory Protection for Healthcare Workers in the Workplace Against Novel H1N1 Influenza A: A Letter Report are available from the National Academies Press, 500 Fifth Street, N.W., Lockbox 285, Washington, DC 20055; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area); Internet, www.nap.edu. The full text of this report is available at www.nap.edu.

This study was supported by funds from the Centers for Disease Control and Prevention and the Occupational Safety and Health Administration. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the organizations or agencies that provided support for this project.

The Institute of Medicine serves as adviser to the nation to improve health. Established in 1970 under the charter of the National Academy of Sciences, the Institute of Medicine provides independent, objective, evidence-based advice to policymakers, health professionals, the private sector, and the public. For more information about the Institute of Medicine, visit the IOM web site at www.iom.edu.

Permission is granted to reproduce this document in its entirety, with no additions or alterations. Copyright © 2009 by the National Academy of Sciences. All rights reserved.