



# HOSPITAL EMPLOYEE HEALTH



THE PRACTICAL GUIDE TO KEEPING HEALTHCARE WORKERS HEALTHY

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RELIAS MEDIA

## NIOSH: Masks as Protective as Respirators Against Influenza

*After 2009 pandemic debacle, study reveals equal protection*

*By Gary Evans, Medical Writer*

In findings that have implications for the next influenza pandemic, the authors of a decade-long study of real-world use of respiratory protection by healthcare workers found no difference between N95 respirators and standard surgical masks.

The study, which included clinicians but was led by the National Institute for Occupational Safety and Health (NIOSH), was conducted at 137 outpatient sites at seven U.S. medical centers between September 2011 and May 2015, with final follow-up in June 2016.

“Each year for four years, during the 12-week period of peak viral respiratory illness, pairs of outpatient

sites within each center were matched and randomly assigned to the N95 respirator or medical mask groups,” the authors reported.<sup>1</sup> Overall, 1,993 healthcare workers wore N95 respirators, and 2,058 wore medical masks when near patients with respiratory illness.

“There was no significant difference in the incidence of laboratory-confirmed influenza among healthcare personnel

with the use of N95 respirators (8.2%) vs. medical masks (7.2%),” the researchers concluded. “As worn by

**“THERE WAS NO SIGNIFICANT DIFFERENCE IN THE INCIDENCE OF LABORATORY-CONFIRMED INFLUENZA AMONG HEALTHCARE PERSONNEL WITH THE USE OF N95 RESPIRATORS VS. MEDICAL MASKS.”**

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**MEDICAL WRITER:** Gary Evans

**EDITOR:** Jill Drachenberg

**EDITOR:** Jonathan Springston

**EDITORIAL GROUP MANAGER:** Leslie Coplin

**ACCREDITATIONS MANAGER:** Amy M. Johnson, MSN, RN, CPN

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### EDITORIAL QUESTIONS:

For questions or comments, call  
Gary Evans at (706) 424-3915.

healthcare personnel in this trial, use of N95 respirators, compared with medical masks, in the outpatient setting resulted in no significant difference in the rates of laboratory-confirmed influenza.”

The calm rationality of that conclusion belies the considerable chaos that sparked the study a decade ago. In 2009, a novel H1N1 A influenza strain appeared suddenly in the U.S., with the virus having made the classic antigenic shift that rendered available flu vaccine useless. An influenza pandemic had begun, the first since 1968 and the fourth since the 1918 Spanish flu killed millions of people.

Generally, pandemics are known to strike younger, healthier people than seasonal flu, in part of because of an inflammatory immune response. Given the lack of an immediate vaccine, the CDC viewed the novel virus with an abundance of caution and recommended N95 respirators for healthcare workers, a step beyond surgical masks long used for seasonal flu.

Several nurses died of H1N1, although it remains unclear in all cases if the virus was acquired in the community or the hospital, and whether respiratory protection or the lack thereof was a contributing factor. Although infectious disease experts said that H1N1 was spreading like normal flu virus — meaning droplet precautions with masks were sufficient to stop transmission — OSHA stepped in to require the N95 respirators for healthcare workers. Further complicating the pandemic response, there were not enough respirators at some facilities to allow compliance with the mandate. Infection preventionists at the time said the respirator issue undermined the medical response, partly because it delayed transfer of H1N1 patients

to facilities that did not have enough gear.

Thus, the NIOSH Respiratory Protection Effectiveness Clinical Trial (ResPECT) was undertaken to try to resolve the issue before the next flu pandemic.

## A Recurrent Question

“Anytime there is a discussion about risks of the next pandemic, this question about whether healthcare workers would be better protected by N95 respirators or masks always seems to come back up,” says **Hilary Babcock**, MD, who co-wrote a commentary on the study.<sup>2</sup> “This study was an attempt to try to more clearly define the safety of surgical or isolation masks in routine use during a range of flu seasons.”

While it may seem obvious that tight-fitting N95 respirators would be more protective, their proven efficacy against small particles may not be as critical for influenza droplets.

“Influenza traditionally has been understood to be primarily transmitted through larger droplets that don’t hang in the air a long time, so they are able to be largely caught in surgical isolation masks,” she says. “The respirators really provide benefit for very small-particle aerosols.”

In experimental models and in occasional anecdotal reports, it appears that there may be some capacity for flu to be transmitted this way, similar to an airborne pathogen like measles. Thus, respirators still are recommended for potential aerosol-generating procedures like bronchoscopy on infected patients. The ResPECT study authors did not look at comparative respiratory protection for potentially aerosol-generating procedures.

“The majority of the time, influenza is still transmitted through larger droplets,” Babcock says. “Those larger droplets are caught by the surgical masks, so they provide equivalent protection for the primary mode of transmission for influenza.”

Although an equivalency was established in the study in terms of respiratory protection, the trial was conducted in outpatient facilities because of cost and feasibility.

“[S]ome differences may potentially affect transmission in inpatient settings, including higher viral burden among more symptomatic patient populations, a higher proportion of immunocompromised patients, and longer and closer interactions between healthcare personnel and patients while providing care (e.g., bathing patients),” Babcock wrote in the commentary.

While seasonal flu viruses mutate and reassemble through a process of antigenic drift that warrants a new flu vaccine every year, it is thought that the basic modes of transmission do not change in seasonal or pandemic strains.

“For most influenza, there is not any evidence, as new strains have emerged over the years, [showing] that they have picked up completely new transmission pathways,” she says. “They still appear to be transmitted primarily through large droplets. I think the surgical masks probably are still adequate.”

However, with emerging respiratory infections like SARS and MERS, it is reasonable to start with respirators until transmission is better understood, she adds.

“We should be actively looking for data to help guide evidence-based recommendations so we can say, ‘For most of the time, these [pathogens] are adequately protected by surgical

masks, but for this virus we clearly need to stick to respirators,” Babcock says. “With new viruses, as they arise, it is important to try to get that right.”

Although the study has limitations, the fact that it reflected real clinical use of the equipment is informative, even if the findings were affected by lack of compliance or inappropriate use.

“Having worn both N95s and face masks, they are both kind of irritating and uncomfortable,” she says. “I think people adjust them and touch them when they take them off and try to keep them from fogging up their glasses. The helpful thing is it’s a real-life study — if this is the way people wear N95s, then that’s the way they wear them. We need to understand the risks of transmission associated with the way these masks are really worn and used by healthcare personnel.”

According to the NIOSH paper, compliance with respiratory protection varies widely in historical studies, with reported ranges from 10% to 84%. In the recently published trial, healthcare personnel “kept diaries that included signs and symptoms of respiratory illness, annual influenza vaccination status, and exposure to household and community members with respiratory illness,” the NIOSH researchers stated.

## NIOSH Perspective

**Maryann D’Alessandro**, PhD, director of the NIOSH National Personal Protective Technology Laboratory (NPPTL), and **Christopher Coffey**, PhD, NPPTL associate director for science, and **David Weissman**, MD, director of the NIOSH Respiratory Health Division, replied to the following

questions from *Hospital Employee Health*.

**HEH:** Why was the study undertaken?

**NIOSH:** The study was commissioned by several public health agencies 10 years ago, just after the 2009 H1N1 pandemic. At that time, there was significant controversy about what personal protective equipment should be used to prevent flu transmission to healthcare workers. The controversy centered around whether healthcare personnel should wear surgical face masks, which block large droplets, or respirators such as N95 respirators, which also can prevent inhalation of small airborne particles. A major problem was a lack of high-quality scientific data to answer this question.

**HEH:** Among outpatient healthcare personnel (HCP), there was no significant difference in lab-confirmed influenza in those who wore N95 respirators vs. medical masks. Are the findings strong enough to recommend that HCP can wear surgical masks instead of respirators during flu season, and even during the next pandemic?

**NIOSH:** Every flu season and pandemic is different. There are many factors that might affect recommendations for a given season, such as effectiveness of the influenza vaccine and severity of illness caused by the circulating strain. These might affect the intensity of prevention recommendations for that year, regardless of the results of this particular study. A very important take-away from the study is that whether they wear face masks or respirators, healthcare workers can get the flu. They should receive annual influenza vaccinations. We need to continue to conduct research to find better ways to protect them.

**HEH:** It seems intuitive that

N95s, with tighter fit and greater particulate filtration, would be more protective than face masks. Why do you think researchers found no difference in protection and efficacy?

**NIOSH:** The study had some limitations, including self-reporting of symptoms in daily diaries [that] likely underestimated illness among HCP who often work while ill, or incomplete participant adherence to assigned protective devices that could have contributed to more unprotected exposures. However, there was no difference between study groups on this. Also, we cannot be sure what proportion of flu transmission occurred at work or in the community. Finally, we still do not know for sure the relative importance of contact transmission,

droplet spray transmission, and aerosol transmission in spreading flu infection.

**HEH:** What do you think are the major implications of this study?

**NIOSH:** We need to continue efforts to better protect healthcare workers through multiple interventions, including engineering and work practice controls, influenza vaccination, and personal protective equipment. There still is a need to better understand influenza transmission and to continue to address the recommendations provided in the 2009 National Academies Report.<sup>3</sup> It is too early to know what impact the current study may have on clinical practice. Health systems need to consider the broader body of scientific literature, including

the current study, when making operational decisions. ■

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# CDC Finalizes Employee Health Guidelines for Healthcare Worker Infections

*Presenteeism, administrative support, occupational health leadership*

The CDC has finalized new infection control guidelines for healthcare workers, putting the onus on hospital administration to provide employee health resources to prevent recurrent problems like presenteeism.<sup>1</sup>

“An occupational health service can’t do that effectively without backup from the top of the organization. They need that support; otherwise, it is not going to work,” says **David Kuhar**, MD, who spearheaded the guideline development as the CDC’s liaison with its Healthcare Infection Control Practices Advisory Committee (HICPAC).

The longstanding problem of presenteeism was recently documented in a study that showed

that healthcare staff in nine hospitals worked an average of two days with upper respiratory symptoms during flu seasons.<sup>2</sup>

“Whether because of individual work ethic, local culture (e.g., unwillingness to disappoint colleagues), or financial pressures such as a lack of paid sick leave or policies that combine sick leave and vacation days, presenteeism puts others at risk,” the CDC guidelines stated.

## Discourage Presenteeism

Developing policies that discourage presenteeism can be challenging, partly because of inadequate backup staff, contractual

workers, and physicians with clinical privileges who are not technically employees of the facility.

“Presenteeism is a big issue and one that needs to be adequately addressed,” Kuhar says. “This guideline itself does not provide very granular recommendations on specific strategies on how you might deal with presenteeism. The best strategies may vary widely based on the healthcare setting, and this guideline is aimed at all [settings]. It’s at a very high level, but we do talk about some of the specific issues.”

A recurrent problem is healthcare systems that combine sick days and vacation leave in a single pool of total days off.

“People are not going to want

to use their vacation time to be sick, so that is not something that discourages people from coming to work when they could be contagious to others,” he says. “Having dedicated sick leave they can use might help remedy that.”

The published guideline will be followed by other sections, with this first document outlining the infrastructure and routine practices for occupational health services to protect workers from infections.

“The second part of the guideline is going to come out in several sections that are going to address the epidemiology and control of selected infections that can be transmitted among healthcare personnel and patients,” Kuhar says. “It will address the infection prevention issues that are relevant to healthcare personnel and will often focus on post-exposure prophylaxis and work restrictions.”

The guidelines, which are the first from the CDC on this issue in 21 years, include a section on facility leadership.

“That is something that is new with this update, as opposed to the 1998 recommendations,” he says. “There are recommendations aimed at healthcare administration. They are focused on ensuring that [employee health programs] have resources and leadership commitment so they can succeed.

The administrative leadership

recommendations by the CDC include:

- Develop a culture of safety, including occupational infection prevention and control;
- Review organizational policies related to occupational infectious risks, exposures, and illnesses;
- Assign one or more people with appropriate training to lead occupational infection prevention and control services;
- Provide resources to implement occupational infection prevention and control;
- Oversee, and include occupational health services leaders in, performance measurement and continuous quality improvement activities for occupational infection prevention.

## Intent to Empower

With support and resources, employee health programs should be better able to protect workers from occupational infections.

“That was the intent,” Kuhar says. “The other part of this was to empower those who may be leading occupational services to have a dialogue with senior leaders and make sure that they have that support when needed.”

The CDC recommendations for occupational health services leaders and staff include:

- Notify all healthcare personnel and relevant departments about infection prevention policies and procedures;
- Collaborate with colleagues to achieve compliance with infection control policies;
- Create infectious disease emergency and outbreak management plans;
- Create written policies and procedures that adhere to federal, state, and local requirements for infection prevention;
- Address factors such as risk reduction among healthcare personnel, medical evaluations, education and training, immunization programs, potentially infectious exposures and illnesses, and personnel health records. ■

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# What the Return of Measles Means for Employee Health

*Staff immunity (or lack thereof), workplace exposures, PEP*

As of Oct. 3, 2019, there have been 1,250 confirmed cases of measles this year in 31 states, the CDC reports.<sup>1</sup>

Vaccine avoidance based on misinformation and unfounded fears is the main reason for the return of this once-eradicated disease in the United States. Facing the possibility of outbreaks or chaotic introductions of even a single case, many facilities are reviewing their healthcare personnel immunity status and furlough policies for measles.

**Hilary Babcock**, MD, MPH, Medical Director at Occupational Health at Barnes-Jewish and St. Louis Children's Hospitals (BJC), is leading such an effort and outlined the project on Oct. 2 at the IDWeek Conference in Washington, DC.

Although her healthcare system has not seen measles cases, Babcock said regional reports of cases and the ongoing national situation make it a matter of "when, not if." Declared eradicated in the United States in 2000, measles understandably fell off the radar at many hospitals. Immunization and related records may have suffered accordingly. Just as clinicians are relearning (or learning for the first time) how to recognize infected patients, it bears reminding that measles is one of the most infectious of the respiratory viruses — a true airborne agent that can linger in the environment.

"We are in the process of [updating] all of our employees' immune status," she said. "We ensured that we have the current isolation recommendation policies in place and that our policies reflect CDC guidance

that all staff should be immune to measles, and, regardless of immune status, should wear N95 respirators in providing care for measles patients."

As part of the proactive program, the hospital created measles room signage that calls for the

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use of airborne precautions with respirators while forbidding entry to nonimmune staff.

Typically, proof of measles immunity for healthcare workers includes documentation of childhood receipt of two doses of measles-containing vaccine. "Ideally, these are both given after the first birthday, with the second dose at least 28 days after the first."

Laboratory evidence of immunity to measles — positivity for Rubeola IgG titer — also is acceptable proof of immunity. "As a reminder, an equivocal titer is considered negative," she said.

The CDC says the old benchmark of birth before 1957 as proof of immunity generally is acceptable under normal conditions, but workers should be immunized if a measles introduction or outbreak occurs. These workers were targeted for titer check or immunization as the measles prevention program was undertaken at her healthcare system, Babcock said.

"I don't see any reason we should wait for that to happen and then try to find all those people and get them vaccinated," she said.

The BJC health systems and affiliated Washington University include some 30,000 employees across multiple facilities. Although some records were incomplete or laborious to access, Babcock and colleagues found around 3,500 employees with unknown measles immunity status.

"We had others that actually had documented nonimmune status," she said. "They had only one MMR documented or documentation of a negative titer with no follow-up. We did wonder a little bit how that happened — that we have people in here documented to be nonimmune."

Reviewing policy history over more than a decade showed somewhat different criteria during different periods. "Many hospitals had variable practices across our system and [varied in] how well they required them and what allowances they had for people to opt out of vaccination," she said.

The next step was an outreach program to contact employees with unknown measles immune status

and those with known nonimmune status.

“We requested documentation of two doses of vaccine, and if [they had] no documentation, we required them to have a titer drawn,” she said. “If the titer was negative, they needed to get MMR. We put timelines on those, so we notified they had to respond within a couple of weeks and then follow up and get the second dose.”

Cost-benefit analysis showed that getting titers to check for measles antibodies was better than simply immunizing everybody with unknown status.

“The cost of titer was lower than vaccine doses, and we hoped there would be plenty [of employees] who were immune — which turned out to be true,” Babcock said. “Many of our occupational health offices also used this as an opportunity to check mumps and varicella titers, and generally clean up vaccination records for the employees.”

Previously, the employee health offices had been notified about the effort, and the clinical labs were likewise ready to test a higher number of titers. The team drafted a medical exemption request form reflecting contraindications to MMR vaccine, including a prior severe reaction, pregnancy, or being immunocompromised.

“We alerted human resources of expected religious accommodation requests, which is a process that we have in place for our influenza mandatory policy,” she said.

The process is ongoing, but Babcock said at IDWeek that titers have been drawn on more than 2,600 employees. Around 2,100 of them have been positive.

“We have a little more than 80% immune documentation among people who didn’t know their status,”

she said. “That has been good for us. We didn’t have to vaccinate those people and have clarified that they are considered immune.”

More than 800 MMR vaccines have been administered to those known or found not immune to measles. Such a massive effort does not come without some trepidation and concern by healthcare workers, so Babcock and colleagues began providing answers to frequently asked questions.

“Because it is a live virus vaccine that we can’t give to immunocompromised patients, many of our employees were worried that if they got this vaccine they would put highly immunized patients at risk,” she said. They were concerned about “transmitting to a patient or a family member who might be immunocompromised.”

## Down the Rabbit Hole

On the contrary, by getting vaccinated, the healthcare workers were protecting patients and immunized family members who rely on the herd immunity of others to protect them from measles, Babcock emphasized.

“There have been no cases of vaccinated healthcare workers transmitting [measles] to patients,” she added. “The CDC recommends no work restrictions for people who have been vaccinated. This is true even if someone has been vaccinated and developed some symptoms like a rash or a low-grade fever. They are still not infectious. That is an immune response to the vaccine.”

Approximately 5-15% of susceptible persons who receive MMR vaccine will develop a low-grade fever and/or mild rash 7-12 days after vaccination. Again, they

are not infectious and this does not require exclusion from work.

Other questions included those who received an ineffective measles vaccine in the 1960s. The CDC told Babcock and colleagues that it is estimated that less than 1 million people received this vaccine and there is no general recommendation to try to find them.

Specifically, the CDC said, “it is safe to assume if there is a record of vaccination that they are immune, unless it specifically can be verified that the healthcare personnel received a killed vaccine.”

“We did not go down that rabbit hole any further,” Babcock said. “If they have documentation from any period, we accept that.”

Questions also arose about licensed independent practitioners (LIPs), physicians, and allied health professionals who, technically, are not employees.

“This is always a challenge for occupational health services,” she said. “These are the people not employed by your facility but who provide services, see patients, and are credentialed to provide care.”

Babcock and colleagues worked through the credential verification office and sent letters to all LIPs reminding them of the criteria for immunity and the expectation that they should be immune.

“We provided information of several ways for them to clarify their status by getting labs drawn or finding their documentation,” she says. “We did remind them that if there are cases and exposures we could find them and we would furlough them and not allow them to come into our hospital.”

Exposure avoidance is the main goal through screening, masking, and patient isolation. However, questions come up about special situations

like transporting patients within or between facilities.

“For most of us who are working with people who may be transferred between facilities, that staff in the ambulance or transport service needed to be immune and wear PPE,” she said. “If the patient can be masked, they should be.”

The ambulance should be taken out of service for two hours to allow the virus to dissipate and for the vehicle to be cleaned before use on another patient, she added.

“For transport within the facility, we usually try to mask the patient and not the transporters for most disease,” she said. “For measles, try to do both — mask the staff and the patient.”

Even if the patient is masked, Babcock recommended clearing the hallways during transport and airing out any elevators that were used.

As a member of the CDC’s Healthcare Infection Control Practices Advisory Committee (HICPAC), Babcock shared some draft guidance on measles exposures. The recommendations will be published as part of the ongoing rollout of the CDC guidelines for preventing occupational infections.

As shared by Babcock at IDWeek, the definition of exposure to measles for healthcare workers is “spending any time while unprotected — not wearing respiratory protection — in a shared air space with an infectious measles patient; or sharing an air space vacated by an infectious measles patient within the prior 2 hours, regardless of immune status.”

She conceded that “any time’ is a pretty high bar. I think it is not really practicable in a real-life setting, and there is a lot of discussion around that.”

There also are a lot of variables at play, like the air exchange of a given

area and how effective and for how long to mask a measles patient.

“There are very little data about the role of source control and the impact of masking,” she said. “We recommend it for patients but we don’t really know how well that works. There also are no great data on duration.”

Clearly, there is higher risk in providing face-to-face care with neither the measles patient nor clinician masked. “[The CDC] can’t

**“SYMPTOM MONITORING IS STILL RECOMMENDED AS WE DO KNOW THAT THERE ARE CASES IN PEOPLE WITH EVIDENCE OF IMMUNITY AFTER AN EXPOSURE.”**

give a cut time, but obviously longer is worse,” Babcock said.

Similarly, quantifying the vagaries of “shared air space” is difficult. An ambulance, exam rooms, and small enclosed waiting areas can pose a risk, but it is considerably harder to determine the likelihood of exposure in large open waiting areas with shared air handling systems across different patient rooms, she said. If such a situation arises with measles, it may be best to consult with air handling and engineering at your facility, Babcock adds.

In another item from the upcoming HICPAC draft guidelines, post-exposure prophylaxis (PEP) and work restrictions are not necessary for healthcare personnel with

presumptive evidence of immunity to measles who have experienced an exposure. However, implement daily monitoring for signs and symptoms of measles infection for 21 days after their last exposure, she said.

“Symptom monitoring is still recommended as we do know that there are cases in people with evidence of immunity after an exposure,” she said. “In some places, depending on your comfort level with risk, there may be different decisions made on how to manage this.”

For healthcare personnel without presumptive evidence of immunity who have experienced an exposure, the HICPAC draft recommends:

- Administer PEP according to recommendations by the CDC and the Advisory Committee on Immunization Practices;
- Exclude from work for the fifth day after the first exposure through the 21st day after their last exposure, regardless of receipt of PEP.

Healthcare workers who have only received the first dose of MMR vaccine prior to exposure may remain at work, but they should receive the second dose by at least 28 days after the first dose. Implement daily monitoring for signs and symptoms of measles infection for 21 days after the last exposure.

For healthcare personnel with known or suspected measles, exclude from work for four days after the rash appears. For immunosuppressed healthcare personnel who acquire measles, consider extending exclusion from work for the duration of their illness. ■

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# NIOSH Updates Opioid Exposure Guidance for EMTs

*Guidelines when response includes illicit drugs like fentanyl*

The National Institute for Occupational Health and Safety (NIOSH) has published a new toolkit with recommendations and resources for protecting EMTs and first responders from exposure to powerful illicit drugs like fentanyl.<sup>1</sup>

*Hospital Employee Health* reached out to **Jennifer Hornsby-Myers**, MS, CIH, industrial hygienist with the NIOSH Emergency Preparedness and Response Office, for more details on the resource.

**HEH:** Can you comment on the use of the toolkit by medical EMTs? Are there particular recommendations that are important to workers providing emergency care and transporting patients to hospitals?

**Hornsby-Myers:** NIOSH has identified prehospital patient care as a job category where first responders might come into contact with illicit drugs including fentanyl or its analogues. NIOSH provides the example of emergency medical services (EMS) providers, including first responders, fire department, and private companies who attend to individuals with suspected fentanyl overdose as responders who may encounter drugs or drug paraphernalia on or near a patient. NIOSH provides recommendations for first responders, including EMS providers, in the Preventing Occupational Exposure to Emergency Responders section of the toolkit.

With all first responder operations involving hazardous materials, standard safe work practices must be followed when illicit drugs such as fentanyl or its analogues are known

or suspected to be present. When arriving at a scene, all responders should analyze the incident, assess the risk for hazards, and determine whether fentanyl or other drugs are suspected to be present.

Responders should receive training in how to minimize exposures; specific recommendations are provided in the guidance and include the following safe work practices:

- Do not eat, drink, smoke, or use the bathroom while working in an area with known or suspected fentanyl or other illicit drugs;
- Do not touch the eyes, mouth, and nose after touching any surface potentially contaminated with fentanyl or other illicit drugs;
- Avoid performing tasks or operations that may aerosolize fentanyl or other illicit drugs, as that increases exposure risks. Activities that aerosolize fentanyl require higher levels of personal protective equipment [PPE] (such as a powered air-purifying respirator or self-contained breathing apparatus) and should be conducted by appropriately trained personnel and in accordance with agency policies and procedures;
- Wash hands with soap and water immediately after a potential exposure and after leaving a scene where fentanyl is known or suspected to be present to avoid potential exposure and to avoid cross contamination. Do not use hand sanitizers or bleach solutions to clean contaminated skin;
- Never handle fentanyl, its analogues, or other illicit drugs without the appropriate PPE. Please see “recommendations for protections

against fentanyl” in the toolkit for PPE appropriate for the risk based on job category and the level of exposure anticipated.

**HEH:** Why is it important to wash hands with soap rather than the commonly used alcohol rubs and hand sanitizers?

**Hornsby-Myers:** Hand sanitizers do not remove or inactivate many types of harmful chemicals, such as illicit drugs (including fentanyl). Responders who come into contact with illicit drugs should immediately use soap and water to thoroughly wash and rinse contaminated skin.

**HEH:** Is it important that emergency workers delay medical care until they don full protection in a setting where illicit drugs are known or suspected?

**Hornsby-Myers:** First responders, including EMS providers, play a critical role in addressing the opioid overdose epidemic and saving lives through emergency medical care that may include naloxone administration. First responders are trained to always perform a scene safety assessment when arriving on a scene. A scene where illicit drugs may be present is no different.

Key recommendations included among those in the NIOSH guidance — training for all first responders on using safe work practices — will not involve any delay in emergency care. When workers are well-trained, and when periodic training in safe work practices is employed, applying PPE is unlikely to take excessive time that would be clinically significant. Importantly, by following

recommendations to prevent exposure to all drugs and chemicals, first responders can successfully and safely reverse overdoses they encounter in the field and allow themselves to continue conducting their duties safely, without developing symptoms.

**HEH:** When and under what conditions should opioid antidotes be administered?

**Hornsby-Myers:** EMS responders should follow their internal policies

and procedures to determine the appropriate medical care for every patient. For more information on the use of naloxone, see the CDC's Opioid Overdose webpage.<sup>2</sup> NIOSH also has guidance and information for any workplace interested in creating a naloxone program.<sup>3</sup> ■

## REFERENCES

1. National Institute for Occupational Safety and Health. Illicit Drug Toolkit for First Responders. Available

at: <https://bit.ly/2odV94n>. Accessed Oct. 28, 2019.

2. Centers for Disease Control and Prevention. Opioid Overdose. Available at: <https://bit.ly/2tRXGyH>. Accessed Oct. 28, 2019.
3. National Institute for Occupational Safety and Health. Using Naloxone to Reverse Opioid Overdose in the Workplace: Information for Employers and Workers. Available at: <https://bit.ly/2J4TeoP>. Accessed Oct. 28, 2019.

# Researchers Find Link Between Hospital Cleaners and COPD

Exposure to disinfectants and cleaning products in the hospitals over time puts nurses at increased risk of developing COPD, investigators reported.<sup>1</sup>

“In a cohort study of 73,262 U.S. female nurses participating in the Nurses’ Health Study II who were followed up from 2009 to 2015, occupational exposure to cleaning products and disinfectants was significantly associated with a 25% to 38% increased risk of developing chronic obstructive pulmonary disease independent of asthma and smoking,” the authors noted.

Previously, exposure to disinfectants in healthcare workers has been associated with respiratory health outcomes, including asthma. Moreover, pathogens like spore-forming *Clostridioides difficile* and emerging *Candida auris* require strong disinfectants to remove from surfaces.

Given the implications of the COPD findings, *Hospital Employee Health* reached out to lead author **Orianne Dumas**, PhD, a respiratory disease researcher at the Université de Versailles in Bretonneux, France.

**HEH:** You found that use of several specific disinfectants was associated with higher risk of COPD development, with many used concurrently. Did you find evidence of a dose-response effect; i.e., the greater the frequency and/or duration of exposure, the higher the risk of COPD?

**Dumas:** We found a dose-response effect according to the frequency of cleaning/disinfection tasks. We did not examine dose-response effect according to duration of exposure. Indeed, in our study we could only investigate the impact of recent exposure (the follow-up duration was ~6 years), as we did not have detailed information on the duration of exposure over the lifetime.

**HEH:** This study included nurses, but is it reasonable to extrapolate that housekeeping and environmental service workers also would be at higher risk of COPD?

**Dumas:** Other epidemiological studies have reported increased risk of COPD in other professions regularly exposed to disinfectants and cleaning products, such as cleaning

workers. In addition, some of these disinfectants, such as bleach and quats, are frequently used in ordinary households. The potential impact of domestic use of disinfectants on COPD development should be investigated.

**HEH:** You found that “the highest risks of COPD incidence among nurses exposed to hypochlorite bleach or hydrogen peroxide and in those combining these exposures with exposure to aldehydes.” How commonly are these used in healthcare?

**Dumas:** Glutaraldehyde and hydrogen peroxide are high-level disinfectants mainly used for medical instruments. Bleach has a variety of uses in healthcare settings, including disinfection of surfaces such as floors and furniture.

**HEH:** What are some possible interventions and alternatives to reduce the risk of these chemicals? Would wearing a mask and/or respirator be partially protective?

**Dumas:** Prevention issues are particularly sensitive in healthcare settings. Indeed, adequate levels of disinfection must be maintained to

protect patients and workers from healthcare-associated infections. Further studies are needed to determine adequate prevention strategies to protect the workers' respiratory health. Potential safer alternatives include emerging nonchemical technologies for

disinfection (e.g., steam, UV light) or green cleaning. Whether the methods of product application (wiping vs. spraying), the environment characteristics (ventilation, room size), or use of masks may modulate respiratory risk also should be investigated. ■

## REFERENCE

1. Dumas O, Varraso R, Boggs KM, et al. Association of occupational exposure to disinfectants with incidence of chronic obstructive pulmonary disease among US female nurses. *JAMA Netw Open* 2019;2:e1913563.

# Assessing Food Allergies in Healthcare Workers

*Adult-onset allergies, higher allergic rates in women*

As reflected in a survey of the general population, more than 10% of healthcare workers may have a food allergy. The study authors found a higher rate of food allergies in women. Employee health professionals may want to take note of this finding in health assessments of nursing staff.<sup>1</sup>

“The present population-weighted data revealed that an estimated 10.8% of U.S. adults had at least one current food allergy during the study period,” the authors noted. “These data suggest that there are currently at least 13 million food-allergic adults who have experienced at least one severe food-allergic reaction, at least 10 million adults who have received food allergy treatment in the emergency department, and at least 12 million adults with adult-onset food allergy.”

## Self-Reporting Is Not Convincing

Interestingly, 19% of respondents self-reported a food allergy, but many of these reports were found “unconvincing” in the study methodology.

“Self-reported food allergies were the main outcome and were

considered convincing if reported symptoms to specific allergens were consistent with IgE-mediated reactions,” the authors noted. “Diagnosis history to specific allergens and food allergy-related healthcare use were also primary outcomes.”

## Women Affected Most

The upshot is that there is a substantial population of people with suspected food allergy who need “appropriate confirmatory testing and counseling to ensure food is not unnecessarily avoided and quality of life is not unduly impaired.”

Women were more likely than men to develop a convincing food allergy, with 13.8% allergic compared to 7.5%, respectively. Compared with younger adults, those age 30 to 39 years had elevated rates of convincing food allergy. Generally, those age 60 years or older had lower allergy rates.

“Overall, approximately half of all food-allergic adults developed at least one adult-onset allergy, suggesting that adult-onset allergy is common in the United States among adults of all ages, to a wide variety of allergens, and among adults with and without additional, childhood-onset allergies,” the authors reported.

The most common allergies were to shellfish, milk, peanuts, tree nuts, and fin fish.

“Given that the most prevalent allergies observed were shellfish and peanut, which prior pediatric work suggests are infrequently outgrown, this finding suggests that the population-level burden of food allergy is likely to increase in the future,” they concluded. ■

## REFERENCE

1. Gupta RS, Warren CM, Smith BM, et al. Prevalence and severity of food allergies among US adults. *JAMA Netw Open* 2019;2:e185630.

## COMING IN FUTURE MONTHS

- National Academy of Medicine landmark report on healthcare burnout
- Thousands of employees vaccinated for flu

- The controversial issue of patient exposures to HCWs with bloodborne infections
- Respiratory infections in pediatric staff



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## CE QUESTIONS

- 1. A decade-long study of real-world use of respiratory protection by healthcare workers for protection against influenza showed:**
  - a. powered air respirators are better for sustained worker use.
  - b. the study was cut short due to the expense of respirators.
  - c. as expected, N95 respirators were more effective by all measures.
  - d. there was no difference between N95 respirators and standard surgical masks.
- 2. Influenza primarily is spread by:**
  - a. airborne particles.
  - b. droplets.
  - c. aerosols.
  - d. contaminated equipment.
- 3. Regarding measles immunity, Hillary Babcock, MD, MPH, said a cost-benefit analysis showed it was better to:**
  - a. perform blood titers to identify immunity.
  - b. immunize all workers with unknown status.
  - c. combine measles vaccine with an annual flu shot campaign.
  - d. not immunize those born before 1957.
- 4. Healthcare personnel with known or suspected measles should be excluded from work for how many days after the rash appears?**
  - a. Two
  - b. Four
  - c. Seven
  - d. 21

## CE OBJECTIVES

After reading each issue of *Hospital Employee Health*, the nurse will be able to do the following:

1. Identify particular clinical, administrative, or regulatory issues related to the care of hospital employees;
2. Describe how the clinical, administrative, and regulatory issues particular to the care of hospital employees affect health care workers, hospitals, or the healthcare industry at large;
3. Cite solutions to the problems faced in the care of hospital employees based on expert guidelines from relevant regulatory bodies, or the independent recommendations of other employee health professionals.