



Adherence to Respiratory Protection Guidelines by Healthcare Workers and Hospitals:

REACH II Evaluation

*NPPTL Stakeholder Meeting
Respiratory Protection for Healthcare Workers
June 18, 2013*

Overview

- Background
- Study design
 - Definition of adherence (OSHA regulations & CDC recommendations)
 - Data sources
- Findings

NIOSH

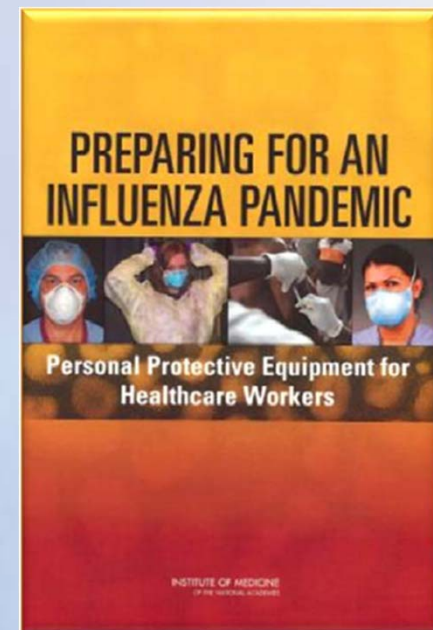
This work was supported by a contract to RTI International from the CDC's National Institute for Occupational Safety and Health (NIOSH), National Personal Protective Technology Laboratory (NPPTL)



Background: IOM 2007 Report

Defines an urgent need to address the lack of preparedness regarding effective PPE for use in an influenza pandemic.
Recommends a focus on:

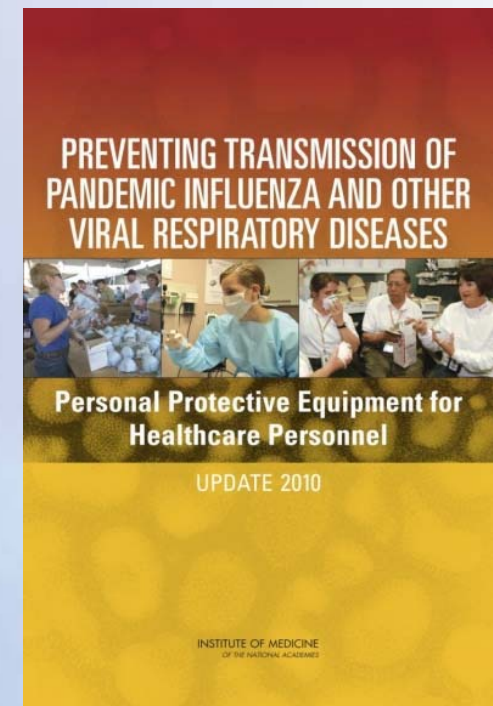
- Understanding influenza transmission
- **Commit to worker safety and appropriate use of PPE**
- Innovate and strengthen PPE design, testing and certification



IOM 2009 Report

Recommends PPE for healthcare personnel

- effectively reduce risks of disease or injury
- minimize negative interactions with or effects on patients, their families, and caregivers
- be acceptable and usable, including ease of communication and comfort
- be practical, and
- be appropriate to the occupational risk



NIOSH's Healthcare Worker PPE Action Plan (2010)

Goal: to encourage the correct use (and disposal) of PPE through training, accreditation, and demonstration projects

1. Demonstration and Sentinel Surveillance System
2. **Evaluation of respirator use for influenza among healthcare workers in acute care facilities**
3. PPT Supply Research
4. Research to establish the economic case for PPE for influenza preparedness

Respirator Evaluation in Acute Care Hospitals Study (REACH)

- REACH I: data from the State of California
 - the use of respirator protection for 2009 H1N1 influenza exposure
- REACH II: 6 states (in 5 regions) across the US
 - the use of respirator protection for **seasonal** influenza exposure

REACH II Study goals

- Describe the extent to which hospitals have implemented required elements of a respiratory protection program for influenza.
- Determine the usage of respiratory protection for influenza exposure among healthcare workers.

Study Design: Adherence Benchmarks

The evaluation focused on adherence of hospital level survey responses to:

- **OSHA standards:** 29 CFR Part 1910, No. 134 guidelines: Occupational Safety and Health Standards, I, Personal Protective Equipment, Respiratory Protection
- **CDC recommendations** (2010). Prevention Strategies for Seasonal Influenza in Healthcare Settings

Source of data

- 4 in-person surveys:
 - Hospital Manager Survey
 - Unit Manager Survey
 - Healthcare Worker (HCW) Survey
 - Interviewer Observation of HCW Respirator Demonstration

- Target populations work in acute care hospitals in 6 states
 - California
 - Illinois
 - Michigan
 - Minnesota
 - North Carolina
 - New York

Respondents

Respondent Group	Total Number	Number per State	Average Number per Hospital
Hospitals	98	11-23	--
Hospital Managers	215	17-46	2.2
Unit Managers	245	26-64	2.5
Healthcare Workers	1,105	102-340	11.2
HCW Observations	356	33-115	3.6

Hospital Level Analysis

Analysis is based on data aggregated at the hospital level. For each survey, each hospital is coded as either “adherent” or “not adherent” following these decision rules:*

- Hospital Manager and Unit Manager Surveys:
 - If at least **50%** of the managers in any given hospital provided a response that adhered to the relevant requirement/ recommendation, the hospital was coded as adherent.
- Healthcare Worker Survey and Observations:
 - If at least **75%** of the healthcare workers in any given hospital provided a response that adhered to the relevant requirement/ recommendation, the hospital was coded as adherent.

* “adhered” = meets or exceeds requirement/ recommendation

Required elements of the RPP – OSHA regulations

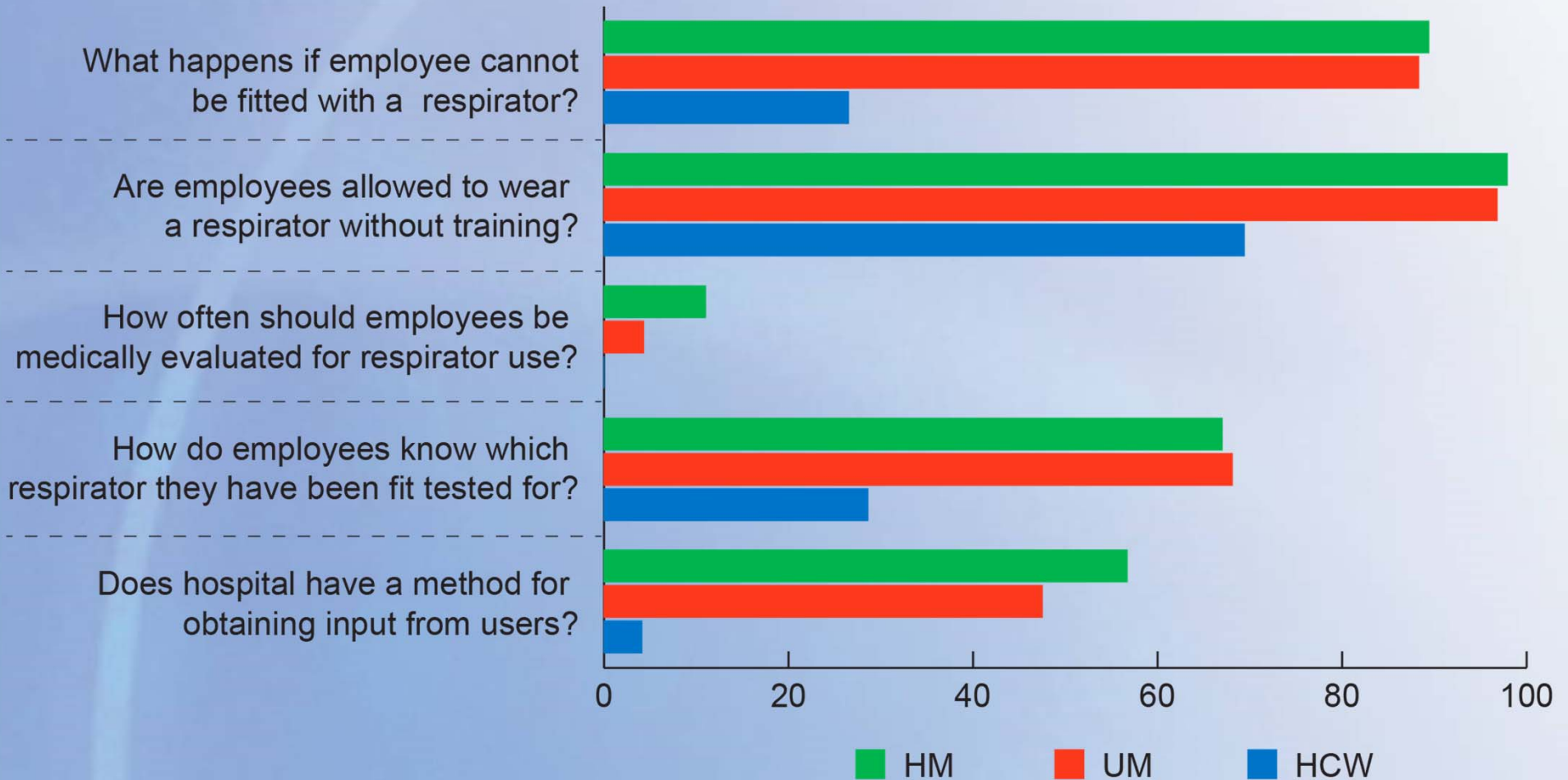
Includes procedures for

1. Selecting respirators
2. Medical evaluations of employees
3. Fit testing
4. Proper use of respirators
5. Maintaining respirators
6. Inspecting respirators
7. Training employees
8. Evaluating the program

Written respirator protection program – OSHA regulations

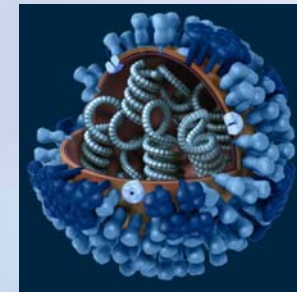
	Adherent Hospitals (%)		
	HM	UM	HCW
Does your facility have a written Respiratory Protection Program (RPP)? [yes]	100%	98%	79%
Are there any employees at your facility who have patient contact and who are not included in the RPP? [no]	76%	78%	--

Fit Testing, Medical Exams, Training, & Program Evaluation – OSHA regulations



Respirator Selection - 6 scenarios

- Infectious disease requiring airborne precautions
 1. in **close contact** with a patient
 2. performing **aerosol-generating procedures** on a patient
- Seasonal influenza
 3. in **close contact** with a patient
 4. performing **aerosol-generating procedures** on a patient
- Confirmed disease requiring droplet precautions
 5. in **close contact** with a patient
 6. performing **aerosol-generating procedures** on a patient



Seasonal Influenza – CDC Guidelines

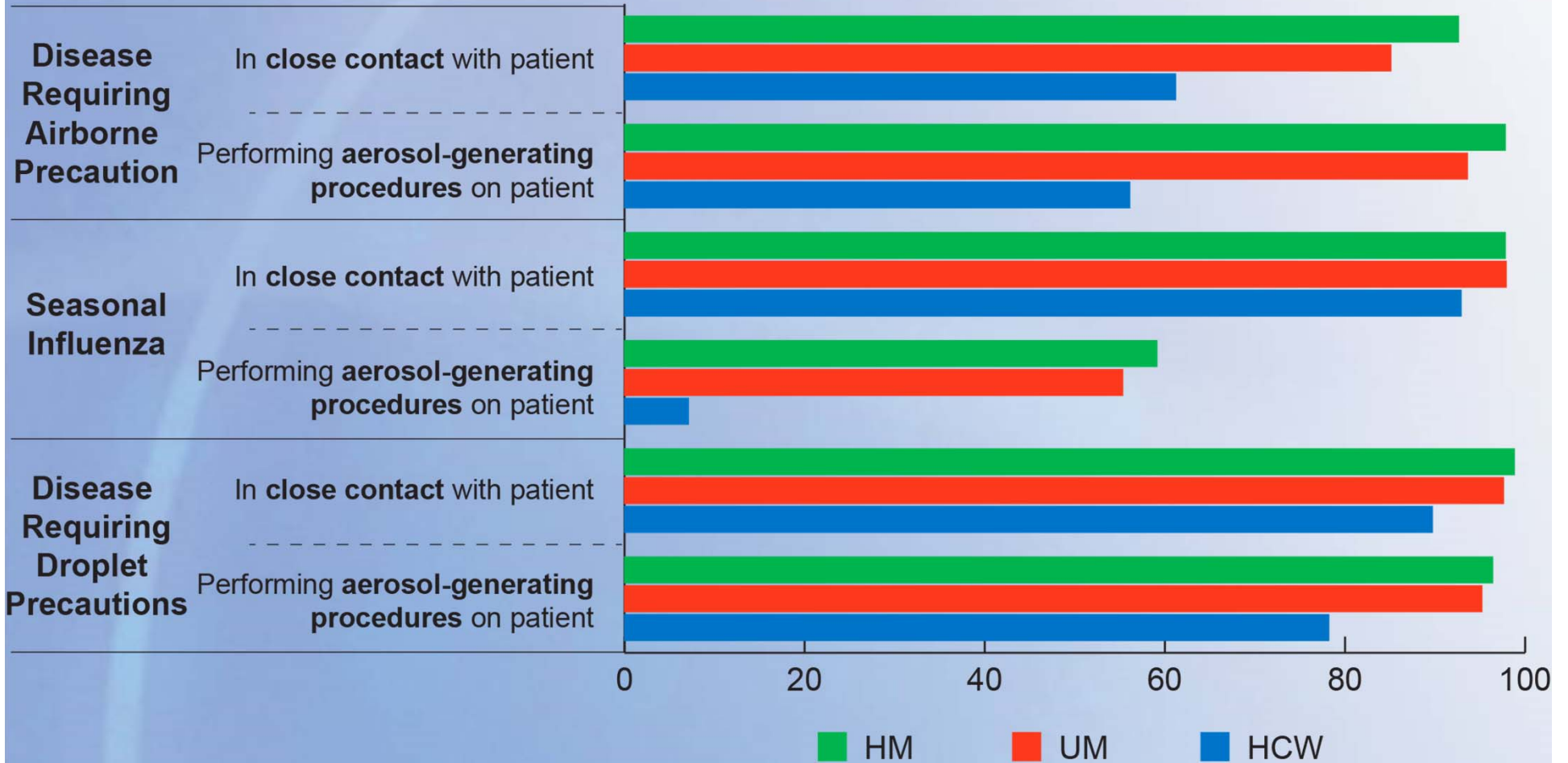


HCP should don a facemask when entering the room of a patient with suspected or confirmed influenza.

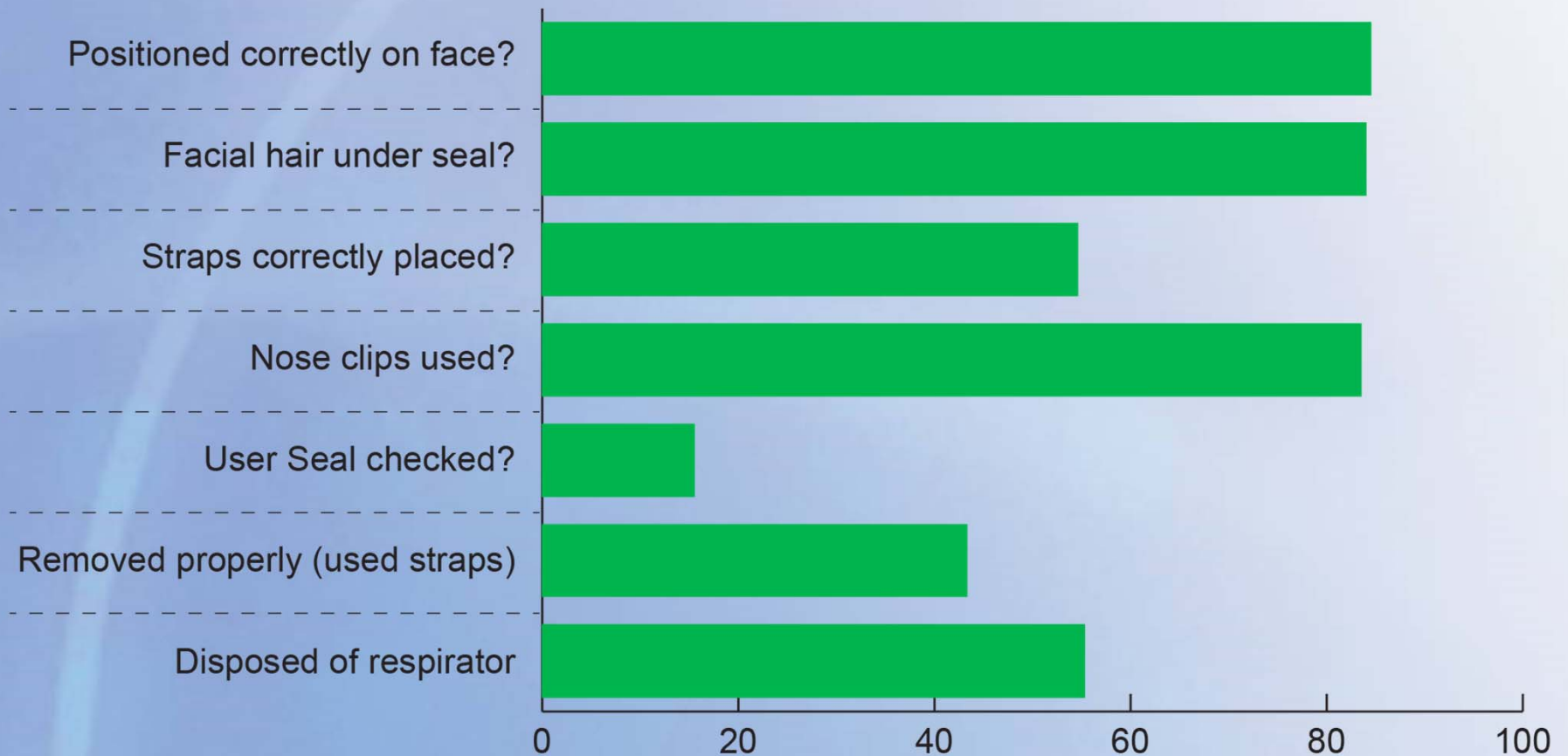


HCP should wear respiratory protection equivalent to a fitted N95 filtering facepiece respirator or equivalent N95 respirator (e.g., powered air purifying respirator, elastomeric) during aerosol-generating procedures.”

Level of Respiratory Protection



Observation results: Donning & doffing



Summary Findings: High adherence rates

- selection of appropriate respirators for 1) close contact or aerosol-generating procedures on a patient with suspected or confirmed disease requiring droplet precautions and 2) close contact with a patient with seasonal influenza
- medical evaluation and clearance before allowing employees to wear a respirator
- fit testing before allowing employees to wear a respirator
- allowing employees to only wear an N95 respirator in the model and size for which they had received a fit test
- employee training on respiratory protection
- using respirators when they are required, and
- respiratory protective equipment located close to the point of use.

Summary Findings: Lowest adherence rates

- selection of appropriate respirators for aerosol-generating procedures on a patient with suspected or confirmed seasonal influenza
- schedule for follow-up medical evaluations
- methods for informing employees about which model(s) and size(s) of respirator they have been fit tested for
- formal documentation of respirator use and supply
- a formal mechanism for evaluating the effectiveness of the RPP
- obtaining staff input during program evaluation, and
- observing respirator usage during program evaluations

Summary Findings: HCW knowledge gaps

High adherence among HMs and UMs but low adherence among HCWs regarding:

- written RPP
- selection of appropriate respirators for close contact or aerosol-generating procedures on a patient with suspected or confirmed infectious disease
- procedures to follow if an employee cannot be successfully fitted with a respirator
- frequency that employees are required to attend respirator training, and
- whether employees are allowed to wear a respirator without training.

HCW knowledge gaps, continued

Low adherence to manufacturer's instructions:

- placing straps correctly
 - checking the user seal
 - removing the respirator properly, and
 - disposing of the respirator.
-
- Inconsistent supervisor monitoring to reinforce protocols?

Conclusions

- The awareness of all hospital staff (HMs, UMs, & HCWs) should be raised about:
 - ❖ respiratory protection in the presence of patients with seasonal influenza
 - ❖ monitoring and evaluating the hospital's RPP, and
 - ❖ medical evaluation and fit testing requirements

- The awareness of HCWs should also be raised about:
 - ❖ respiratory protection in the presence of patients with infectious disease requiring airborne precautions
 - ❖ training requirements, and
 - ❖ correct respirator use

Next steps

- Disseminate findings
- Develop targeted information campaigns to raise awareness



More Information

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Additional Information

Medical evaluation and clearance

	Adherent Hospitals (%)		
	HM	UM	HCW
Do employees receive medical evaluation and clearance before being allowed to wear a respirator? [yes]	98%	97%	91%
If Yes, how frequently are employees medically evaluated? [once at hire, then as required by physician]	11%	4%	0%

Fit testing – OSHA regulations

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT).

	Adherent Hospitals (%)		
	HM	UM	HCW
Do employees receive fit testing before being allowed to wear a respirator? [yes]	99%	100%	--
Do employees receive fit testing before being allowed to wear an N95 respirator? [yes]	--	--	96%

Fit testing, continued

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested

- prior to initial use of the respirator,*
- whenever a different respirator facepiece is used, and*
- at least annually thereafter.*

	Adherent Hospitals (%)		
	HM	UM	HCW
How often do most employees receive fit testing after hire? [at least annually]	93%	100%	76%
Are employees allowed to wear an N95 respirator model or size for which they have not received a fit test? [no]	98%	96%	84%

Fit testing, continued

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative...or quantitative fit test.

	Adherent Hospitals (%)		
	HM	UM	HCW
What type of fit test is administered? [Quantitative or Qualitative]	94%	--	--
Which type of qualitative test agent is used? [Saccharin and Bitrex]	97%	--	--
What happens if an employee cannot be successfully fit tested? [put into a PAPR or reassigned to a lower risk job]	89%	88%	27%

Fit testing, continued

A written copy of the current respirator program shall be retained by the employer...(and)...shall be made available upon request to affected employees.

	Adherent Hospitals (%)		
	HM	UM	HCW
How do employees know which model(s) and size(s) of respirators they have been fit tested for? [yes]	67%	68%	29%

Maintenance and storage

	Adherent Hospitals (%)		
	HM	UM	HCW
Does your facility track respirator defects or problems? [yes]	84%	50%	--
Are respirators are being maintained properly? [yes]	--	--	21%

Training

	Adherent Hospitals (%)		
	HM	UM	HCW
Does your facility offer employees training in <u>how</u> to properly use respiratory protection? [yes]	99%	99%	93%
Do employees receive training about <u>when</u> to wear respiratory protection? [yes]	99%	100%	99%

Training

	Adherent Hospitals (%)		
	HM	UM	HCW
Are employees permitted to wear a respirator without training? [<i>no</i>]	98%	97%	69%
How often are employees required to attend respirator training? [<i>once at hire, then annually</i>]	86%	95%	54%

Program evaluation

	Adherent Hospitals (%)		
	HM	UM	HCW
Does your facility... formally document respirator use and supply? [yes]	70%	28%	--
have a formal mechanism or method to evaluate the effectiveness of the RPP? [yes]	53%	39%	--
During the program evaluation... is input from respirator users formally solicited? [yes]	57%	48%	4%
do you determine whether respirators are available for employees who need them? [yes]	93%	87%	--

Program evaluation

	Adherent Hospitals (%)		
	HM	UM	HCW
During the program evaluation ...			
do you determine whether employees are wearing their respirators properly? [yes]	75%	75%	--
does anyone observe you to make sure you are donning, doffing, and disposing respirators properly? [yes]	--	--	14%
do you determine whether respirators are being maintained properly? [yes]	82%	66%	--
does anyone observe you to make sure you are using respiratory protection when required? [yes]	--	--	30%

Program evaluation – OSHA regulations

	Adherent Hospitals (%)		
	HM	UM	HCW
Are you expected to report defects or problems with respiratory equipment? [yes]	--	--	97%
Are healthcare workers formally asked to provide input on respiratory protection policy decisions? [yes]	57%	48%	4%

Proper procedures – observation results*

	%
Positioned correctly on face? <i>[Yes]</i>	85%
Facial hair under seal? <i>[No]</i>	84%
Straps correctly placed? <i>[Yes]</i>	55%
Nose clips used? <i>[Yes]</i>	84%
User Seal checked? <i>[Yes]</i>	16%
Removed properly (used straps)? <i>[Yes]</i>	43%
Disposed of respirator? <i>[Yes]</i>	55%

*Type of respirator observed: N95

Infectious Disease Requiring Airborne Precautions

	Adherent Hospitals (%)		
	HM	UM	HCW
What is the minimum level of respiratory protection employees are required to use when ...			
in close contact with a patient who has a suspected or confirmed infectious disease requiring airborne precautions, such as measles? [<i>N95 respirator</i>]	93%	85%	61%
performing aerosol-generating procedures on a patient who has a suspected or confirmed infectious disease requiring airborne precautions, such as measles? [<i>N95 respirator</i>]	98%	94%	56%

Seasonal Influenza

	Adherent Hospitals (%)		
	HM	UM	HCW
What is the minimum level of respiratory protection employees are required to use when ...			
in close contact with patients who have suspected or confirmed seasonal influenza? [<i>Surgical mask</i>]	98%	98%	93%
performing aerosol-generating procedures on a patient who has seasonal influenza? [<i>N95 respirator</i>]	59%	55%	7%

Confirmed Disease Requiring Droplet Precautions

	Adherent Hospitals (%)		
	HM	UM	HCW
What is the minimum level of respiratory protection employees are required to use when ...			
in close contact with a patient who has a suspected or confirmed disease requiring droplet precautions (e.g., pertussis)? <i>[Surgical mask]</i>	99%	98%	90%
performing aerosol-generating procedures on a patient who has a suspected or confirmed disease requiring droplet precautions (e.g., pertussis)? <i>[Surgical mask]</i>	96%	95%	78%

Written respirator protection program (RPP) – OSHA regulations

In any workplace where respirators are necessary to protect the health of the employee or whenever respirators are required by the employer, the employer shall establish and implement a written respiratory protection program with worksite-specific procedures.

Medical evaluation and clearance – OSHA regulations

The employer shall provide a medical evaluation to determine the employee's ability to use a respirator, before the employee is fit tested or required to use the respirator in the workplace.

The employer shall ensure that a follow-up medical examination is provided for an employee....whose initial medical examination demonstrates the need for a follow-up medical examination.

Fit testing – OSHA regulations

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative fit test (QLFT) or quantitative fit test (QNFT).

The employer shall ensure that an employee using a tight-fitting facepiece respirator is fit tested

- prior to initial use of the respirator,*
- whenever a different respirator facepiece is used, and*
- at least annually thereafter.*

Fit testing, continued

The employer shall ensure that employees using a tight-fitting facepiece respirator pass an appropriate qualitative...or quantitative fit test.

A written copy of the current respirator program shall be retained by the employer...(and)...shall be made available upon request to affected employees.

Maintenance and storage – OSHA regulations

Certify the respirator by documenting the date the inspection was performed,...the person who made the inspection, the findings, required remedial action, and a serial number...of the inspected respirator.

The RPP shall include...procedures and schedules for cleaning, disinfecting, storing, inspecting, repairing, discarding, and otherwise maintaining respirators.

Training – OSHA regulations

...requires the employer to provide effective training to employees who are required to use respirators....

(regarding)

- why the respirator is necessary*
- what the limitations and capabilities of the respirator are*
- how to use the respirator effectively*
- how to inspect, put on and remove, use, and check the seals of the respirator*

Training – OSHA regulations

The employer shall provide the training prior to requiring the employee to use a respirator in the workplace.

Retraining shall be administered annually, and when (there are)...changes in the workplace or the type of respirator (that) render previous training obsolete; inadequacies in the employee's knowledge or use of the respirator; or any other situation arises in which retraining appears necessary to ensure safe respirator use.

Program evaluation – OSHA regulations

...requires the employer to conduct evaluations of the workplace to ensure that the written respiratory protection program is being properly implemented, and to consult employees to ensure that they are using the respirators properly. Factors to be assessed include.....

- respirator fit*
- appropriate respirator selection for the hazards to which the employee is exposed;*
- proper respirator use under the workplace conditions the employee encounters; and*
- proper respirator maintenance.*

Respirator Selection Options

Surgical mask



N95 Filtering facepiece



Elastomeric half-face N95



Powered air-purifying respirator (PAPR)

