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# Respiratory Protection in Health Care: Opportunities for Risk Reduction

**Don Wright, MD, MPH**  
**Director: Office of Occupational Medicine**  
**Occupational Safety and Health**

**United States Department of Labor**



# Presentation Overview

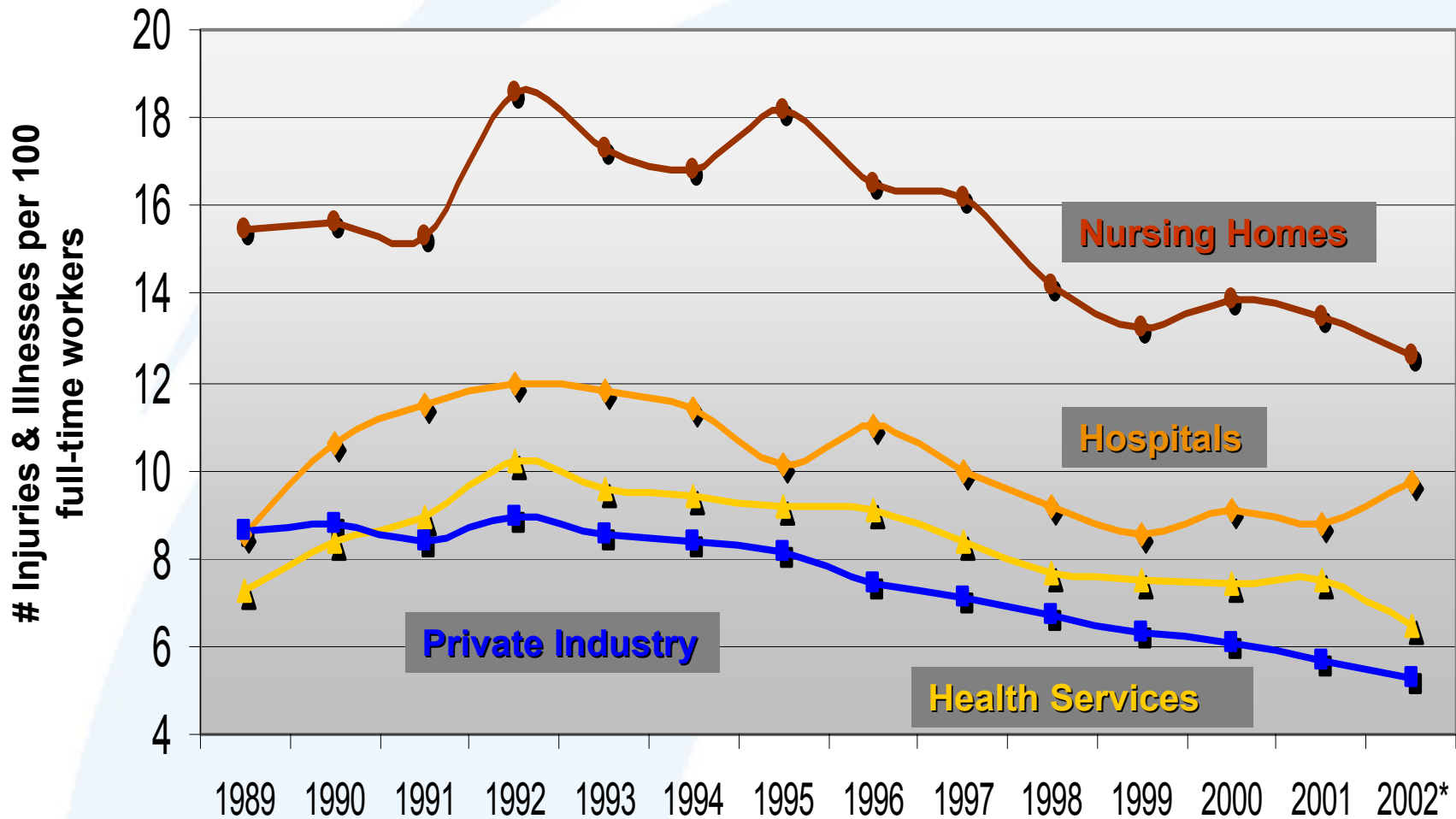
- **Report on the State of Occupational Safety and Health in the Healthcare Industry**
- **Respiratory Hazards in Healthcare**
- **Case Study: Model Practice in Hospital Respiratory Protection**

# Healthcare Workers: Workforce at Risk

- **US Healthcare industry employs approximately 10 million workers**
- **Healthcare workers compose 8% of workforce**
- **Healthcare industry illness and injury statistics are high**



# Work injury and illness rates in health services and all private industries, 1989-2002



Source: BLS survey of Occupational Injuries & Illnesses

2002\* - There is a break in series due to definitional changes to the injury and illness recordkeeping requirements

# Occupational Hazards in Healthcare

- **Chemical – Solvents, Antineoplastic drugs, etc.**
- **Biologic – TB, HIV, SARS, HBV**
- **Physical – Ionizing Radiation, Noise**
- **Musculoskeletal – Patient handling**
- **Work Organization – Shift work, Stress, Workplace violence**

# Respiratory Hazards in Healthcare

- **Patient – Biologic**
  - **Tuberculosis**
  - **SARS**
  - **Pertussis**
  - **Varicella**
  - **Anthrax**
  - **Plague**
  - **Smallpox**



# Respiratory Hazards in Healthcare

- **Diagnosis - Treatment**
  - **Radiation**
  - **Pharmaceuticals**
  - **Disinfectants**
  - **Chemical Reagents**
  - **Anesthetic Gases**
  - **Formalin**



# Emerging Respiratory Hazards in Healthcare: Terrorism

- **Chemical Agents**
  - Nerve Agents – Sarin
  - Blister Agents - Mustard
- **Biologic Agents**
  - Anthrax
  - Smallpox
  - Plague
- **Radioactive Agents**
  - “Dirty Bomb”





# **Respiratory Protection in Healthcare: A Critical Need**

- **Hospital employees are potentially exposed to a wide variety of air contaminants**
  - **Chemical agents**
  - **Infectious agents**
  - **Terrorism agents**
- **Engineering controls may not be adequate or feasible**

# Model Practice: Hospital Respiratory Protection

Dartmouth-Hitchcock  
Medical Center (DHMC)



# Dartmouth-Hitchcock Medical Center



## DHMC

### Mary Hitchcock Hospital

- 396 Inpatient beds
- Tertiary Care Center,  
New Hampshire

### Dartmouth Hitchcock Clinic

- Physicians  
throughout  
NH & VT

### Dartmouth Medical School

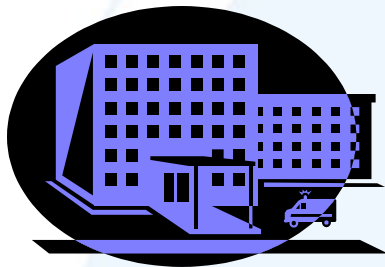
- 600 Students
- 16 Departments

**Total Employees = 6300**  
**4300 Direct Patient Care**

# DHMC Respiratory Protection Program

**Program Administrator  
Safety and Environmental Program Manager**

## Industrial RPP



## Clinical RPP



- **Written RPP**
- **Hazard Assessment**
- **Select Respirator**
- **Maintain Records**
- **Evaluate Program**
- **Fit Test – Champions**
- **Training – Champions**
- **Medical Certify – OM**

# Industrial Respiratory Program



- **75 certified for industrial respirator use**
- **Spill Response Team – Chemical Spills**
- **Engineering- Change HEPA filters**
- **Lab Workers– Formalin, Xylene, Biologic Agent**
- **Pharmacy – Antineoplastic Drugs**
- **Safety and Environmental Program Employees**

# Chemical Agents

<b>Hazard</b>	<b>Respirator</b>	<b>Filter</b>	<b>Activity</b>
<b>Particulates</b>	<b>N 95</b>	<b>White</b>	<b>Maintenance personnel when sweeping etc.</b>
<b>Acids (Muriatic/HF)</b>	<b>APR</b>	<b>White/ Magenta</b>	<b>Facilities maintenance</b>
<b>Formalin</b>	<b>APR</b>	<b>Olive</b>	<b>Path Lab activities/ spills</b>
<b>Org Vapors</b>	<b>APR/P100</b>	<b>Black</b>	<b>Spray painting application</b>
<b>Antineoplastic Drugs</b>	<b>APR N100</b>	<b>Magenta</b>	<b>Pharmacy – Cleaning of hoods and spills</b>

# Clinical Respiratory Protection Program: Patient Portals of Entry



**Identified 19 departments with “increased risk” of exposure to infectious aerosol patients**

- Emergency Dept.
- IV Team
- Occupational Medicine
- ICU
- Radiology
- Housekeeping
- Transportation
- General Med Clinic
- Fast Track
- Infectious Disease

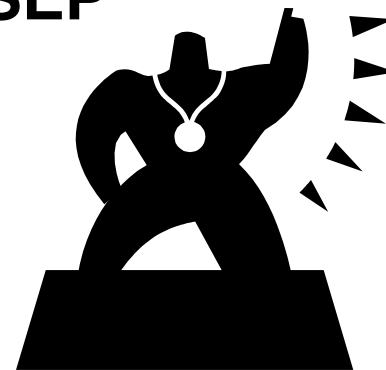
# Infectious Agents

<b>Infectious Agent</b>	<b>Respirator</b>	<b>Activity</b>
<b>TB/ SARS etc Routine Patient Care</b>	<b>N 95 Filtering Face Piece Respirator</b>	<b>Routine Patient Contact</b>
<b>TB/SARS Aerosol Generating Procedures</b>	<b>Powered Air Purifying Respirator</b>	<b>Aerosol Generating Procedures  Facial Hair</b>



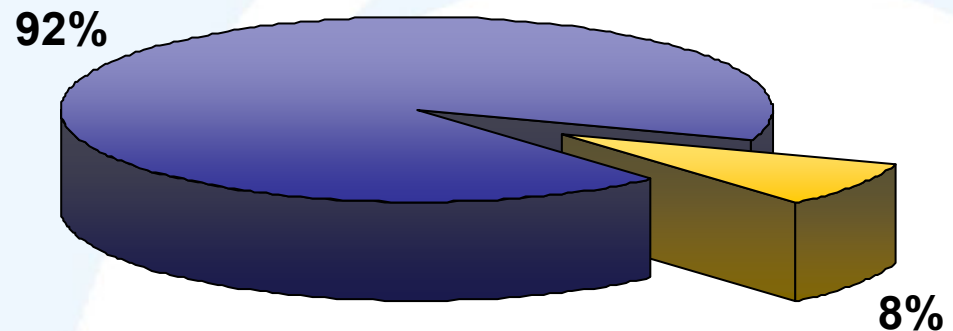
# Departmental program champions manage the respiratory protection program.

- **One Champion per shift in “high risk” departments**
- **Champions: manage departments RPP**
- **Receive comprehensive “ Train the Trainer” training**
- **Fit Test and Educate Personnel**
- **Track Departments Respirator Qualified Personnel**
- **Ensure 24/7 coverage of “infectious aerosol” patient**
- **Departments receive periodic audits from SEP**



# Departmental program champions are an efficient utilization of resources.

- **Approximately 350 employees certified (8% of staff)**
- **Approximately 4 cases of TB per year**
- **Have treated other airborne infectious diseases, such as Pertussis**



# Terrorism and Respiratory Response

- **Trauma Decontamination Team**

- **Supplied Air Respirators (SAR)**
- **Reevaluating use of SAR (tripping hazard)**



- **Ambulatory Decontamination Team**
  - **PAPR with Protective Clothing**

# **DHMC: Preparing for the Infectious Crisis**

- **Program Champions can rapidly certify additional users if situation demands**
- **ID Readiness Committee ( SARS group)**
- **Contingency Plan to convert wing to Respiratory Isolation if demand requires**
- **Field Hospital – Off-Site Location Identified**
- **Testing the Plan: Table Top Exercise**

# **“Protective” Code Blue**

- **Response to “real time” incident**
- **Large numbers of staff respond to Code Blue**
- **“Protective” Code Blue limit responders**
- **Six responders– MD, Nurse, RT, CPR Team**
- **Pre-positioned Respiratory Response Cart**
  - **2 PAPR on top**
  - **6 Tag Locked PAPR in drawer**
  - **All CPR supplies**

# Tabletop Exercise

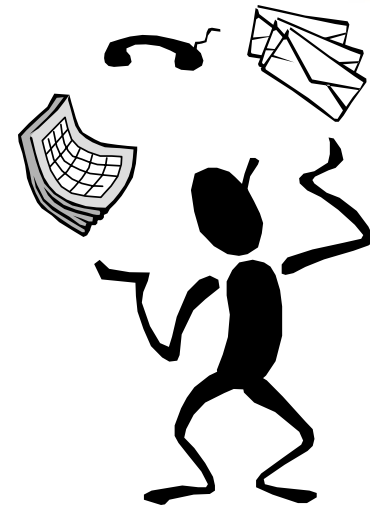


# Lessons Learned

- **Form ID Disaster Work Group**
- **General audit system (supplies/training)**
- **Proactive work by Public Affairs**
- **Improve method of staff notification**
- **Clarify facilities covered by lockdown**
- **Adopt color system for restricting access**
- **Drill operations and decision making**

# Program Challenges

- **Employee Turnover**
- **Communication and Education with Units**
- **Availability of Clinical Staff**
- **Management “Buy In”**
- **Decontamination of PAPR**
- **Audit Process**





# Take Home Message

- **Injury/Illness rates in healthcare are high**
- **Hospitals have numerous and varied respiratory hazards**
- **Hospital need a comprehensive RPP**
- **Respiratory protection programs can be both comprehensive and preserve valuable financial resources.**