Health care workers can be exposed to a variety of infectious agents during performance of their duties. Respirators are frequently used to provide protection from exposure these airborne infectious agents. This factsheet presents information about the use of respirators and ways to increase their effectiveness.

**USE A RESPIRATOR, NOT A SURGICAL MASK**

Although surgical masks (SM) and N95 filtering facepiece respirators (FFR) are both commonly found in health care settings, they serve very different roles.

**Surgical Masks (SM)**

A surgical mask can:

- Protect patients and surfaces from bacteria and other particles exhaled by health care workers.
- Protect health care workers from contact with sprays or splashes that may contain infectious organisms.

**A SM DOES NOT reduce inhalation of small airborne particles that may contain infectious organisms.**

**Disposable N95 Filtering Facepiece Respirators (FFR)**

N95 FFR are designed and tested to remove small airborne particles, like those that might carry infectious organisms.

In addition, they are designed to seal well with the user’s face, which further reduces the amount of infectious particles that enter the FFR.

N95 FFR have demonstrated superior filtration and fit characteristics compared to surgical masks in laboratory and workplace studies with inert (non-biological) and non-infectious biological particles. Many laboratory studies have confirmed that biological particles are filtered in the same manner and at the same efficiencies as inert particles.

However, limited attempts to study the relative efficacy of the two devices in reducing disease transmission have yielded inconclusive results. This is probably because no study has actually measured the biological particle filtering capability of either surgical masks or N95 FFR under working conditions.

Nonetheless, the previously noted laboratory and workplace studies indicate that N95 FFR will provide a higher level of protection against airborne transmission of disease than will surgical masks.

**A N95 FFR can reduce the number of infectious aerosols you inhale, which might reduce your chance of infection.**

**WEAR THE RESPIRATOR**

A significant shortcoming of studies to date is that the test subjects have not worn their assigned devices at all times of potential exposure. The investigators typically report estimated compliance with wearing the respirator of 50 to 75%.

**A respirator can offer appropriate protection from inhaled particles only if it is worn during all potential exposures.**

The graph below illustrates how rapidly protection is lost during periods of non-wear time:
As the graph shows, most of the advantage of wearing a more protective respirator (capable of a 500-fold exposure reduction, which is much higher than an N95 FFR is expected to provide) is lost if it is not worn for at least 90% of the exposure period. At 50% non-wear time, a twofold reduction of exposure is the best performance that any respirator can provide. This phenomenon occurs regardless of the respirator’s capabilities or how well the respirator fits the wearer. Inadequate wear time is the likely reason that some performance studies to date have not clearly shown the superior protection the N95 FFR offers. For example, simply taking the respirator off to talk when infectious particles are present in the air might allow enough exposure to cause infection.

The single best way to maximize the respiratory protection provided by an N95 FFR is to wear it properly during all potential exposure periods.

FOLLOW THE PROVISIONS OF YOUR EMPLOYER’S RESPIRATORY PROTECTION PROGRAM

Failure to wear the respirator at all potential exposure times is only one way N95 FFR can be misused, resulting in decreased protection. Respiratory protection programs are designed to prevent misuse and other poor practices, thereby maximizing performance.

Training in proper use and using individual qualitative or quantitative fit-testing are critical elements to ensure performance of N95 FFR. Only qualitative or quantitative fit-tests can be used to select a well-fitting respirator for each individual. User seal checks are not adequate for verifying the fit of a respirator.

RESPIRATORS ALONE WILL NOT PREVENT DISEASE TRANSMISSION

Diseases may be transmitted via:

- Small aerosols
- Droplets or sprays
- Hand to mucous membrane contact
- Direct surface contact
- Combinations of these mechanisms.

All routes of exposure should be minimized by engineering controls (e.g., ventilation) and by work practice controls. In addition, the use of gowns, gloves, eye shields can help to minimize transmission.

Frequent hand washing with soap and water can help minimize transmission through exposure routes other than inhalation.

The agents that cause disease are often prevalent in the community outside the health care workplace. Immunizations and hand washing can help to reduce disease transmission in both environments. It is not known if the use of N95 FFR or other protective equipment in non-occupational settings is helpful in reducing the spread of disease.

An annual seasonal flu vaccination is the best way to reduce the chances that you will get seasonal flu.

KEY FACTS

- Health care workers can receive protection from airborne infectious organisms by wearing disposable N95 Filtering Facepiece Respirators.
- The protection a respirator provides is quickly lost if it is not worn at all times.
- The best way to maximize respiratory protection is to wear a respirator properly all of the time.

FOR MORE INFORMATION CONTACT:

- American Industrial Hygiene Association: www.aiha.org
- Centers for Disease Control and Prevention: www.cdc.gov/flu/protect/preventing.htm
- National Personal Protective Technology Laboratory: www.cdc.gov/niosh/npptl
- Occupational Safety and Health Administration: www.osha.gov

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