The '4 Fs' of medical mask selection

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As hospitals look to combat hospital-acquired infections amid the rise of antibiotic resistance, it is important for providers to be equipped with the proper facial protection for each clinical situation in surgical and procedural settings.

In a June 22 webinar hosted by *Becker's Hospital Review* and sponsored by Cardinal Health, Angela Maxwell, RN, senior consultant for clinical operations at Cardinal Health, and Tricia L. Boring, RN, assistant nurse manager of the operating room at Fredericksburg, Va.-based Mary Washington Hospital, discussed American Society for Testing and Materials medical mask protection standards and how to select the right mask.

The right mask can help reduce the risk of facial exposure to blood and other bodily fluids. This protective apparatus is especially important in today's healthcare environment as hospitals and health systems are placing an added emphasis on HAI reduction, improving patient safety and protecting staff. At the same time, the prevalence of pathogens known as "superbugs" — such as methicillin-resistant *Staphylococcus aureus* — is on the rise.

While selecting a medical mask may seem like a simple enough task, there are nuances in design and protection standards that should be considered prior to selection.

Mask classifications

Procedure masks are easily identifiable by the presence of two ear loops to secure the mask to the face and are used on hospital floors, isolation units, and labor and delivery units, among other areas of the hospital. Additionally, these masks may be used in the emergency department and the intensive care unit for bedside procedures. However, they are not suitable for use in the operating room.

Surgical masks are primarily used by OR staff and have two straps that secure the mask to the face instead of loops. They are intended to protect against a high risk of fluid exposure.

"Another way to think about it," Ms. Boring said, "is that surgical masks are designed for sterile environments and procedure masks are designed for clean environments."

A third type of mask is the **surgical N95 respirator**, which is used to filter surgical smoke created by energy-generating devices such as electrosurgical units, lasers and ultrasonic scalpels or dissectors during invasive procedures. The N95 is recommended whenever there is a need to wear respiratory protective equipment as secondary protection against residual surgical smoke. It should also be worn during higher-risk aerosol-generating procedures on patients with known or suspected aerosol-transmittable diseases such as tuberculosis, varicella and rubella. Standard surgical masks with ties should not be used during these procedures.

Exposure risks

Originally developed to minimize the risk of patient wound infection due to microorganisms transmitted from clinicians, today's masks are intended to protect both

the patient and clinician from new and drug-resistant pathogens transmitted by blood or other body fluids. Additionally, smoke plumes created by high-speed devices can contain toxic chemicals as well as other irritants and particulate contaminants, including dust.

Exposure to bloodborne pathogens is one of the top five causes of injury among healthcare workers, Ms. Maxwell said. Blood or blood products are involved in 63 percent of exposure incidents, yet 76 percent of OR directors incorrectly provide their staff with procedure masks instead of surgical masks.

The risks are not only physical: organizations and staff cited for improper use of personal protective equipment can be fined over $25,000 for each infraction, according to Ms. Boring.

Three levels of ASTM barrier protection

ASTM International tests products to improve quality and safety. It defines more than 12,500 international standards across a wide variety of services and industries, including barrier protection standards for medical masks. Here are the three levels of ASTM barrier protection:

Level 1: low barrier protection for general use for low-risk, nonsurgical procedures and exams that do not involve aerosols, sprays and fluids. An ear loop mask is a level 1 mask. ASTM level 1 masks are the general standard for both surgical and procedural use.

Level 2: moderate barrier protection for low-to-moderate levels of aerosols, sprays and fluids.

Level 3: maximum barrier protection for any situation that has the potential for exposure to heavy levels of aerosols, sprays and fluids. Cardinal Health recommends this level as a best practice for supporting OR safety initiatives.

"When choosing the right mask, always look to the level of protection that is recommended by ASTM," Ms. Maxwell said.

The "4 Fs" of mask selection

During the webinar, Ms Maxwell outlined four considerations for mask selection.

1. Filtration: When smoke is present or when interacting with a tuberculosis-infected patient, use a high filtration mask (N95 respirator).

2. Fluid resistance: Choose a fluid-resistant mask when there is any chance of blood or other bodily fluid splatter. ASTM level 3 surgical masks are recommended.

3. Features: Always use a level 3 surgical mask with ties in surgical settings. Anti-fog film, foam and tapes reduce fogging issue distractions, and shields and protective eyewear keep eyes clear of blood and splash.

4. Fit: Even the correct mask could put clinicians at risk if it is not worn correctly. The nose and mouth must be completely covered and create a seal around the face to prevent gaps that increase the risk of inhalation exposure.

Listen to the webinar recording here. View the webinar slides here.