

# Choosing the right mask

## A guide to ASTM barrier protection standards

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### Addressing today's risks

Choosing the right mask for each surgical and procedural situation has never been more important, for three key reasons:

1. The risk of facial exposure to blood, bodily fluids, secretions and excretions.
2. Today's clinical emphasis on reducing healthcare-associated infections.
3. The renewed focus on patient and staff safety, as well as quality initiatives. A catalyst for this effort has been the rise of new pathogens and antibiotic-resistant bacteria (the "super bugs").

To help address these challenges, the purpose of masks has evolved over time. Originally, they were developed to minimize the risk of patient wound infection due to microorganisms transmitted from clinicians via coughs, sneezes and droplets.

Today's masks are intended to protect both patients and clinicians from several risks, including:

- New and drug-resistant pathogens transmitted by patient blood or other bodily fluids.
- Smoke plume that can contain toxic chemicals and other irritants.
- Particulate contaminants that include dust expelled by high-speed devices.

In particular, one of the exposure risks is to blood borne pathogens, including HIV, HBV, HVC and others. This risk impacts 5.6 million healthcare workers,<sup>2</sup> and it's one of the top five causes of injury among them.<sup>3</sup>

In fact, blood or blood products are involved in 63 percent of exposure incidents.<sup>4</sup> Twenty-six percent of OR blood exposures are to the heads and necks of scrubbed personnel,<sup>5</sup> while 59 percent of blood and bodily fluid exposures are among experienced OR doctors.<sup>6</sup> Seventeen percent of blood exposures occur with circulating personnel outside the sterile field.<sup>7</sup> Yet, 76 percent of OR directors make procedure instead of surgical masks available for OR staff.<sup>8</sup>

### Three mask classifications

#### 1 Procedure masks

- Three or four layers of construction
- Two ear loops secure mask to face
- Not suitable for OR
- For hospital floors, isolation, sterile core and processing, labor and delivery, ER and ICU

#### 2 Surgical masks

- Three or four layers of construction
- Two straps secure mask to face
- Primarily used by OR staff
- Intended for a high risk of fluid exposure

#### 3 Surgical N95 respirator

- Evacuates surgical smoke from energy-generating devices during operative or other invasive procedures (ESUs, lasers, ultrasonic scalpels/dissectors)
- Secondary protection against residual surgical smoke
- Also for higher-risk, aerosol-generating procedures on patients with known or suspected aerosol transmittable diseases<sup>1</sup>

## How are masks typically selected today?

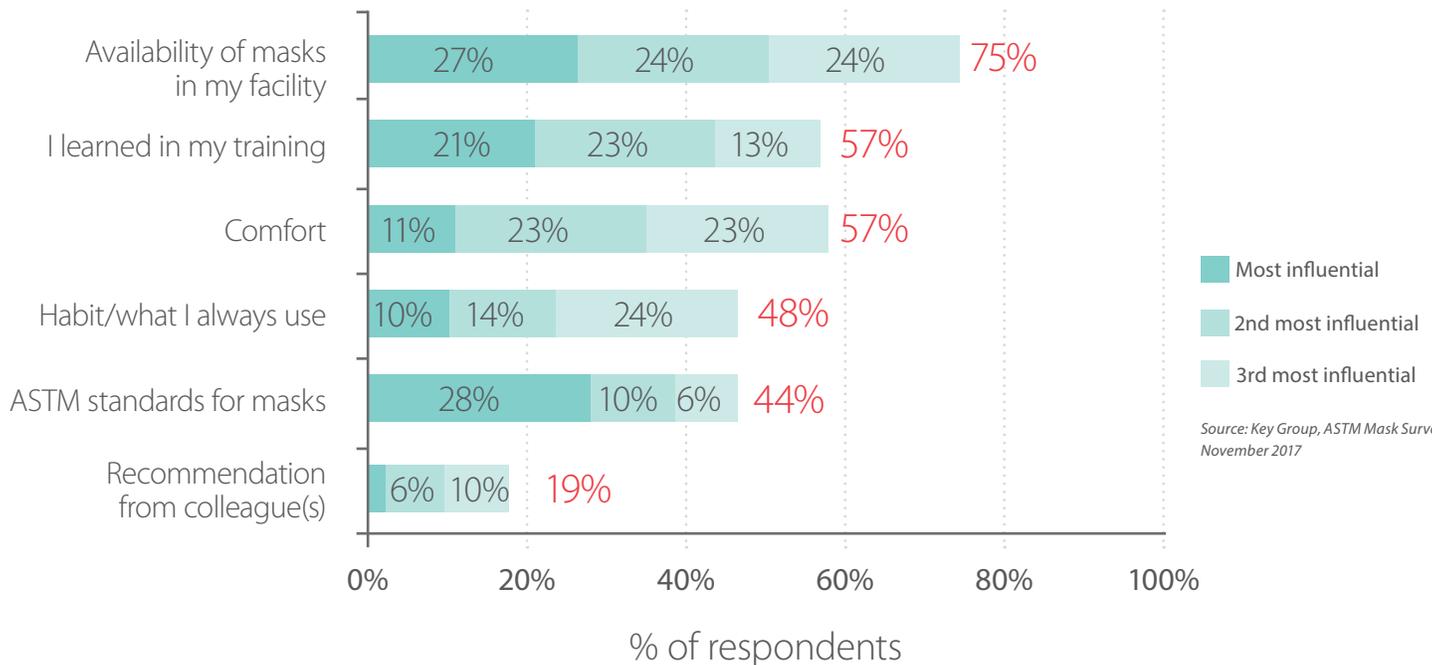
According to a recent survey conducted among hundreds of OR nurses, non-OR nurses, infection control practitioners and other clinicians, the most influential factor when selecting a mask is simply what's available at the facility. Following that are training, comfort and habit. Only 44 percent of survey respondents ranked ASTM standards as an influencer—and that leads to a significant safety issue.

According to the same study, 75 percent of participants use the incorrect PPE for the procedure or setting.<sup>9</sup> That may lead not only to staff and patient health risks, but also regulatory citations and fines. Following ASTM standards would help solve the problem, but awareness of them is low:

- 48 percent of OR staff are unaware of ASTM standards and the different levels of protection.<sup>10</sup>
- 57 percent of face mask units sold in 2016 did not have or claim an ASTM rating.<sup>11</sup>

While 84 percent of facilities surveyed have a mask selection protocol, more than half of clinicians said they use their medical judgment when selecting a mask—even if that falls outside the protocol. The encouraging news is that 95 percent of those surveyed said they would change their selection if they had higher awareness of ASTM standards.

### How masks are selected



## How ASTM sets the standard

ASTM defines more than 12,500 international standards for safety and quality across a wide variety of industries and services. Healthcare organizations globally adopt ASTM recommendations to implement best practices.

For masks, ASTM sets three levels of barrier protection:

1. Level 1: low barrier protection: general use for short procedures and exams that don't involve aerosols, spray or fluids.
2. Level 2: moderate barrier protection: for low to moderate levels of aerosols, spray and/or fluids.
3. Level 3: maximum barrier protection: for heavy levels of aerosols, spray and/or fluids.

To determine if a mask is Level 1, 2 or 3, ASTM evaluates several characteristics, including bacterial filtration efficiency, sub-micron particulate filtration, differential pressure and flame spread. The greatest difference between the three levels is in the mask's resistance to penetration by synthetic blood. The minimum resistance pressure in a Level 3 mask is double that of a Level 1 mask.

## The "4 Fs" of selecting the right mask

For both safety and comfort, follow these four best practices for mask selection:

### Filtration

When smoke is present or interacting with a patient with a known or suspected aerosol transmittable disease, use a high filtration mask (N95 respirator).

### Fluid resistance

Wear a fluid resistant mask if there's any chance of blood and/or bodily fluid splatter. ASTM Level 3 surgical masks are recommended for the OR.

### Features

Depending on the setting, choose ear loops or ties to secure your mask (ear loops are not recommended for the OR). To reduce distractions from fogging issues, consider anti-fog film, foam and tapes. And to keep eyes clear of blood and splash, wear shields and protective eyewear.

### Fit

Even the right mask incorrectly worn could put you at risk. Be sure to cover your nose and mouth completely, creating a seal around the face to prevent gaps that increase the risk of inhalation exposure.

A fifth best practice is **feel**, the right mask should also be comfortable and promote breathability.

## Choosing your next mask

The goal is to always keep safety top of mind. Are you selecting the right mask to protect yourself, based on ASTM standards? Above all, you should always follow your hospital protocol for mask selection. Cardinal Health uses the "4 Fs" and ASTM standards as general guidelines:

- ASTM Level 3 masks provide maximum protection—without compromising comfort and breathability.
- ASTM Level 1 masks are the general standard for both surgical and procedural uses.
- In addition, N95 respirators protect when lasers or cautery tools are used.

For training assistance with Cardinal Health brand products, contact the Cardinal Health clinical mask team. Ask about additional resources as well, including a CE course and mask selection guide.

- 1 AORN Guideline for Perioperative Practice, 2017 edition, Guideline for Surgical Smoke Safety, I.SMK20.
- 2 <https://www.osha.gov/SLTC/bloodbornepathogens/recognition.html>
- 3 [https://www.osha.gov/dsg/hospitals/documents/1.1\\_Data\\_highlights\\_508.pdf](https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf)
- 4 [https://www.osha.gov/dsg/hospitals/documents/1.1\\_Data\\_highlights\\_508.pdf](https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf)
- 5 AORN Guideline for Surgical Attire, Page 113 section I.h., 2017
- 6 <https://www.ncbi.nlm.nih.gov/pubmed/19122191>
- 7 AORN Guideline for Surgical Attire, Page 113 section I.h., 2017
- 8 Key Group, ASTM Mask Survey, November 2017
- 9 Key Group, ASTM Mask Survey, November 2017
- 10 Key Group, ASTM Mask Survey, November 2017
- 11 GHX Data Analysis, Q4FY16 pulled 10/19/17, 8 quarters summarized, Acute Class included