Choosing the right mask

A guide to ASTM barrier protection standards

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Welcome

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Objectives

1. Outline the two mask classifications
2. Review the risks of improper mask use
3. Describe the purpose of ASTM and its mask selection standards
4. Overview the three ASTM barrier protection levels
5. Know the “4 Fs” of mask selection

About Cardinal Health

Recognized leader in healthcare supply chain transformation

- Top ranking for transforming the healthcare value chain to meet new challenges around costs, revenues and outcomes

Unparalleled understanding of healthcare value chain

- Supplier and leading manufacturer of med/surg products
- Leader in providing supply chain services with 40+ years experience

Expertise in PPE equipment for the OR

- 722 million units of surgical and medical products sold annually across the US[1]

Clinical support team ready to serve you

- 2,500 clinicians throughout Cardinal Health
- Dedicated clinical mask team to help you with staff education

Why is choosing the right mask important?

1. **Risk of facial exposure to blood and fluids**

2. **Clinical emphasis on reducing healthcare-associated infections (HAIs)**

3. **Renewed focus on patient and staff safety/quality initiatives**

Two mask classifications

1. **Procedure masks**
   - Three or four layers of construction
   - Two ear loops secure mask to face
   - Not suitable for OR
   - Used on 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

Surgical N95 respirator

- Evacuate all surgical smoke generated by energy-generating devices during operative or other invasive procedures:
  - ESUs, lasers, ultrasonic scalpels/dissectors
- Wear respiratory protective equipment as secondary protection against residual surgical smoke
- Also wear during higher-risk, aerosol-generating procedures on patients with known or suspected aerosol transmittable diseases
  - Tuberculosis
  - Varicella
  - Rubeola[2]


Cone Style


Flat Fold Style

Q1 - What masks are you using for ECU procedures today?

A. I don’t know
B. Surgical Masks with ties
C. Procedure Masks with loops
D. N95 Respirator

How has the purpose of masks evolved?

- **From protecting the patient…**
  - Originally developed to minimize the risk of patient wound infection due to microorganisms transmitted from clinicians (coughs, sneezes, droplets)

- **…to protecting both patient *and* clinicians.**
  - New and drug-resistant pathogens transmitted by patient blood or other bodily fluids
  - Smoke plume can contain toxic chemicals and other irritants
  - Particulate contaminants include dust dispelled by high-speed devices

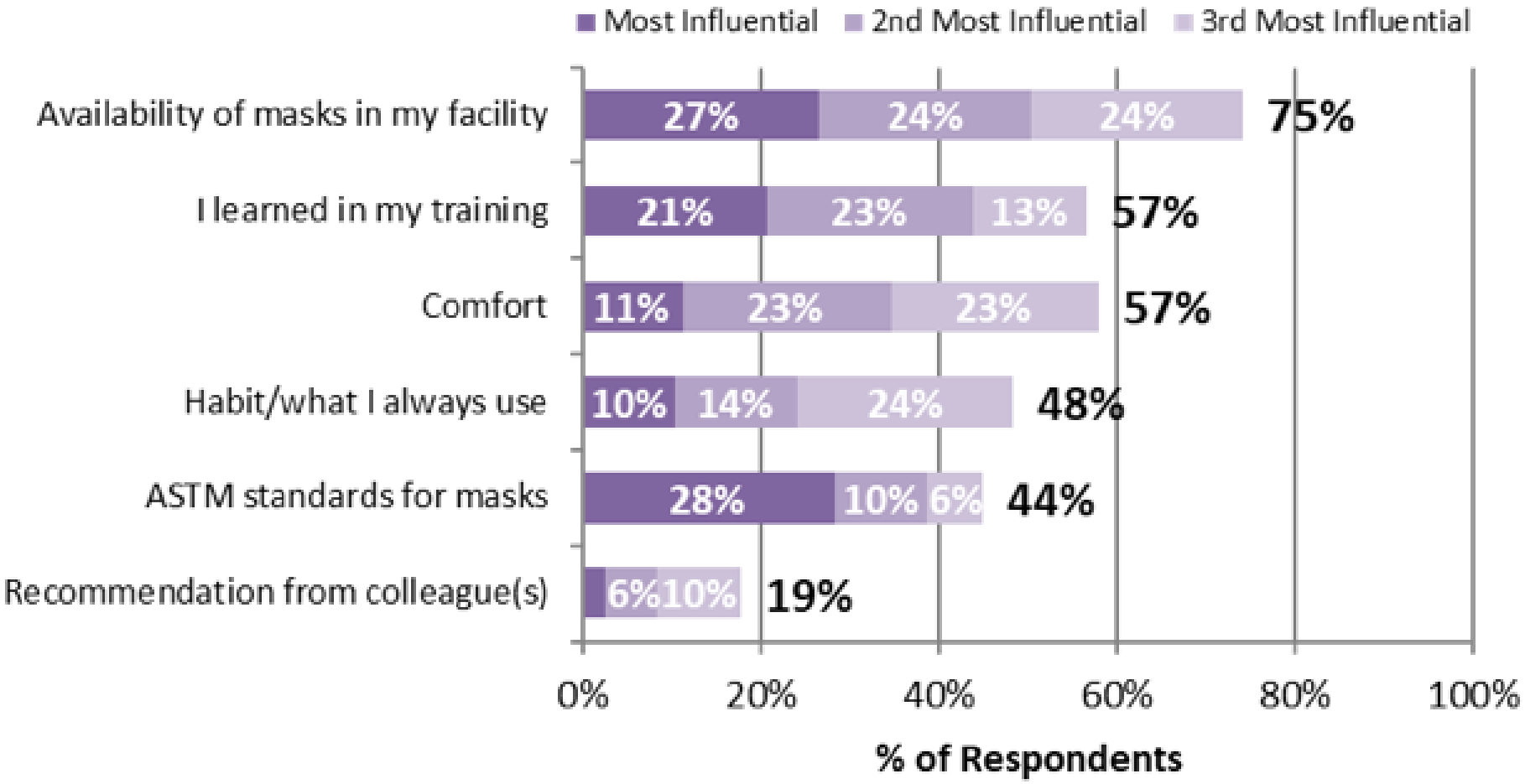
The risks are real

- **One of the exposure risks is to blood borne pathogens, including HIV, HBV, HVC and others[3]**
- **One of the top five causes of injury among healthcare workers[4]**
- **Blood or blood products involved in 63% of exposure incidents[5]**
  - 26% of OR blood exposures are to the heads and necks of scrubbed personnel[6]
  - 59% of blood and bodily fluid exposures among experienced OR doctors[7]
  - 17% of blood exposures occur with circulating personnel outside the sterile field[8]
- **Yet, 76% of OR directors make *procedure* masks available for OR staff[9]**

Q2 – How aware are you of the costs associated with exposure incidences or citations from staff related injuries?

A. Very aware
B. Somewhat aware
C. Not at all aware

How are masks typically selected?[10]



Q3 – How are you selecting your masks?

A. What is provided to me
B. What I learned in training
C. Comfort
D. Habit/what I always have used
E. Leverage the ASTM standards

Most people choose the wrong mask

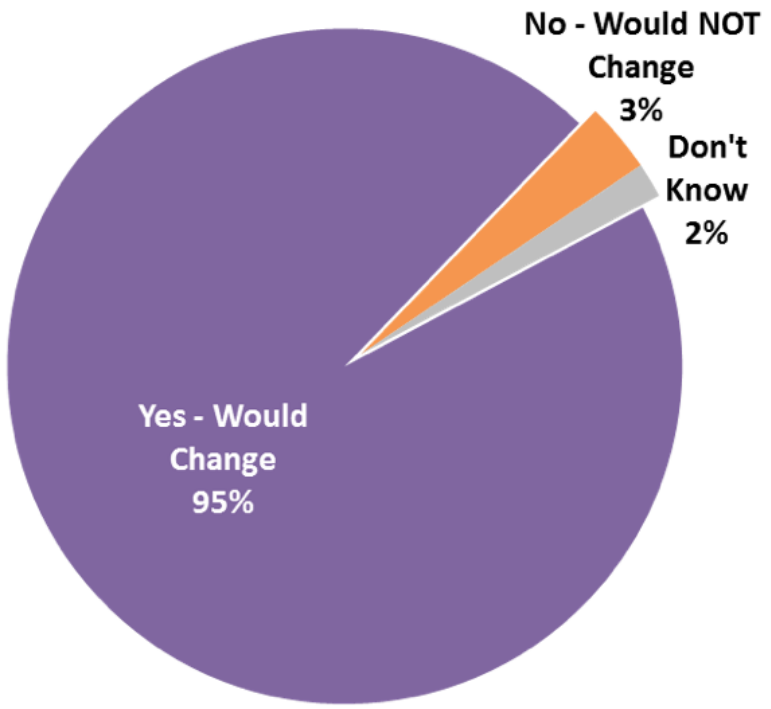
- **75% use the incorrect PPE for the procedure or setting[11]**
- **May lead not only to staff and patient health risks, but also regulatory citations and fines**
- **Following ASTM standards would help solve the problem, but awareness of them is low:**
  - 48% of OR staff unaware of ASTM standards and different levels of protection[12]
  - 57% of face mask units sold in 2016 did not have or claim an ASTM rating[13]

Clinical Insights: Incorrect usage

- **Proper mask usage is an important part of nurse training**
- **Yet, even nurses wear the wrong mask for the level of risk**
- **Mary Washington Hospital focuses on proper mask selection, to help avoid HAIs**
  - **Extensive staff training**

Medical judgement vs. ASTM industry standards

- **84% of facilities have a mask selection protocol**
- **56% of the time clinicians use medical judgement—even if *outside* of protocol**
- **95% would change their selection if awareness of ASTM standards was increased—including OR nurses, non-OR nurses and managers[14]**



Q4 – Does your institution have current protocol based on ASTM guidelines?

A. Yes
B. No
C. I am not aware

What is ASTM International?

- Defines more than 12,500 international standards across a wide variety of industries and services
- Healthcare organizations globally adopt ASTM recommendations to implement best practices
- In 2001, ASTM created protocol F 2100 to define three standardized mask levels; updated in 2012

Three levels of ASTM barrier protection

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

How ASTM levels are determined

CHARACTERISTICS	LEVEL 3	LEVEL 2	LEVEL 1
Bacterial filtration efficiency	≥98%	≥98%	≥95%
Sub-micron particulates filtration efficient at 0.1 micron	≥98%	≥98%	≥95%
Differential pressure, mm H20/cm2 (Breathability)	<5.0	<5.0	<4.0
Resistance to penetration by synthetic blood, minimum pressure in mm Hg for pass result	160 mm Hg	120 mm Hg	80 mm Hg
Flame spread	Class 1	Class 1	Class 1

The “4 Fs” of selecting the right mask

Protection over preference – keeping safety top of mind

**Use ASTM standards to support choices around filtrations and fluid resistance*

1. Filtration

- When smoke is present or interacting with TB infected patient, use a high filtration mask (N95 respirator)

2. 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 as an OR best practice

3. Features

- Securement – loops or ties (*Mask with ear loops are not recommended for the OR)*
- Anti-fog film, foam and tapes reduce distractions from fogging issues
- Shields and protective eyewear keep eyes clear of blood and splash

4. Fit

- Even the right mask not worn correctly could put you at risk
- Nose and mouth must be covered completely
- Create a seal around the face to prevent gaps that increase the risk of inhalation exposure

Filtration

Fluid Resistance

Features

Fit

Bonus: Feel

- Comfort & breathability

Clinical Insights: Correct usage

- **Nursing leaders expected to do what's right to keep OR staff safe**
- **Mary Washington Hospital provides OR options for fit and feel—all while meeting Level 3 safety requirements**

Choose right every time

- **The heath hazards are real—3 out of 4 mask decisions are incorrect[15]**
- **Follow your hospital protocol for mask selection**
- **Cardinal Health uses the "4 Fs" and ASTM standards for 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 use
  - In addition, N95 respirators protect when lasers or electrocautery tools are used
- **We can assist with training on Cardinal Health brand products**

Q&A

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References

[1]Cardinal Health internal sales data. Analysis completed July 2017.

[2]AORN Guideline for Perioperative Practice, 2017 edition, Guideline for Surgical Smoke Safety, I.SMK20.

[3]https://www.osha.gov/SLTC/bloodbornepathogens/recognition.html

[4] https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf

[5] https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf

[6] AORN Guideline for Surgical Attire, Page 113 section I.h., 2017

[7] https://www.ncbi.nlm.nih.gov/pubmed/19122191

[8] AORN Guideline for Surgical Attire, Page 113 section I.h., 2017

[9] Key Group, ASTM Mask Survey, November 2017

[10]Data: Key Group, ASTM Mask Survey, November 2017

[11]Data: Key Group, ASTM Mask Survey, November 2017

[12]Data: Key Group, ASTM Mask Survey, November 2017

[13]GHX Data Analysis, Q4FY16 pulled 10/19/17, 8 quarters summarized, Acute Class included

[14]All data on this slide: Key Group, ASTM Mask Survey, November 2017

[15]Data: Key Group, ASTM Mask Survey, November 2017