VIVA eBook™

September 2021

AEROSOLS IN DENTISTRY: THE CONTINUING STORY OF RESPIRATORY PROTECTION

VIVA LEARNING™

AEROSOLS ARE A SERIOUS HEALTH HAZARD

The Risks are Significant

The COVID-19 pandemic shined a spotlight on something that should have been on your radar already: aerosols in dentistry.

Studies show that operating room personnel are struck in the face by fluids 45 to 51% of the time. You can assume these numbers are significantly higher in dentistry, which by its very nature creates a great deal of aerosols.

For example, recently a dentist used ultraviolet light to show where aerosol and saliva contamination went during a dental procedure. In addition to covering his hands and splattering on his shirt, about two-thirds of his mask was covered in contamination as well.

> You can count on being hit with aerosols and/or saliva during most dental procedures.

It's Not Just about COVID-19!

While COVID-19 put the issue of respiratory protection front and center on dental professionals' minds, the aerosols in your operatory can expose you and your patients to a wide variety of other infectious diseases as well.

In many cases you're literally working in a sea of infectious aerosol. A short list of the types of infectious diseases that you can be exposed to includes:

- SARS-CoV-2
- SARS
- Influenza
- Measles
- Rubella
- M. Tuberculosis
- Ebola
- Varicella (chicken pox)
- Pertussis
- Group A strep

Some studies have shown that hygienists typically have the highest rates of influenza not only among dental team members but among all healthcare providers. When you think about the amount of aerosol that hygienists were exposed to previous to COVID-19 when most did not wear N95 respirators or use High-Volume Evacuators, this statistic is not surprising.

UPDATES ON COVID-19-SPECIFIC REGULATIONS

Updates from the CDC

The widely reported May 13, 2021, CDC guidance stating that fully-vaccinated people no longer need to wear a mask or physically distance in any setting (except where required by other laws, rules and regulations) does not apply to healthcare settings. What's important for you to know is that the CDC's recommendations for the use of personal protective equipment (PPE) by healthcare professionals remains unchanged, regardless of vaccination status.

CENTERS FOR DISEASE™ CONTROL AND PREVENTION

At this point you should still screen your patients and unvaccinated employees for temperature and COVID-19 symptoms, ask vaccinated employees to self-monitor for any type of symptoms, wear PPE, etc.

Unfortunately, the last CDC guidance update regarding COVID-19 that was specifically directed at dentistry is from December 2020 (see https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html) . Therefore you should continue to use the same infection prevention and control procedures that you have been using. This also includes all of the recommended "engineering controls" related to ventilation, patient placement and patient volume.

Updates from OSHA

In March 2021 the U.S. Occupational Safety and Health Administration (OSHA) issued guidelines on respiratory protection for dentistry. As this chart shows, OSHA's guidance states that you need to look at three criteria to determine what type of PPE you should be wearing in any given situation:

1. The current rate of community transmission of COVID-19 in your local area. The CDC provides this information at https://covid.cdc.gov/covid-data-tracker/#datatracker-home.
2. The patient's COVID-19 disease status.
3. Whether the procedure will generate aerosols.

OSHA® Occupational Safety and Health Administration

To determine what type of PPE to wear, look at:

- Community infection rates
- Disease status
- Type of procedure

Recommended PPE ensembles for dentistry

Care of patients in areas where community transmission of COVID-19 has subsided in the local area		Care of patients in areas where community transmission of COVID-19 continues in the local area		Care of patients with suspected or confirmed COVID-19, regardless of community transmission of COVID-19 in the local area	
Dental procedures not involving aerosol-generating procedures	*Dental procedures that may or are known to generate aerosols*	*Dental procedures not involving aerosol-generating procedures*	*Dental procedures that may or are known to generate aerosols*	*Dental procedures not involving aerosol-generating procedures*	*Dental procedures that may or are known to generate aerosols*
▪ Work clothing, such as scrubs, lab coat, and/or smock, or a gown ▪ Gloves ▪ Eye protection (e.g., goggles, face shield) ▪ Face mask (e.g., surgical mask,)	▪ Gloves ▪ Gown ▪ Eye protection (e.g., goggles, face shield) ▪ At a minimum, face mask (e.g., surgical mask,) with face shield ▪ NIOSH-certified, disposable N95 filtering facepiece respirator (or better) offers more protection to workers who may encounter asymptomatic or pre-symptomatic patients who can spread COVID-19 or other aerosolizable pathogens†	▪ Work clothing, such as scrubs, lab coat, and/or smock, or a gown ▪ Gloves ▪ Eye protection (e.g., goggles, face shield) ▪ At a minimum, face mask (e.g., surgical mask,)with face shield ▪ NIOSH-certified, disposable N95 filtering facepiece respirator (or better) offers more protection to workers who may encounter asymptomatic or pre-symptomatic patients who can spread COVID-19 or other aerosolizable pathogens†	▪ Gloves ▪ Gown ▪ Eye protection (e.g., goggles, face shield) ▪ NIOSH-certified, disposable N95 filtering facepiece respirator or better†	▪ Gloves ▪ Gown ▪ Eye protection (e.g., goggles, face shield) ▪ NIOSH-certified, disposable N95 filtering facepiece respirator or better†	▪ Gloves ▪ Gown ▪ Eye protection (e.g., goggles, face shield) ▪ NIOSH-certified, disposable N95 filtering facepiece respirator or better†

Updates from the FDA

Last year, when PPE was in short supply, the U.S. Food and Drug Administration (FDA) issued Emergency Use Authorizations for non-NIOSH-approved disposable respirators. This included decontamination and reuse of disposable respirators. As of July 6, 2021, these Emergency Use Authorizations have been revoked.

It is no longer permissible for you to use disposable respirators that have not been approved by NIOSH (National Institute for Occupational Safety and Health), such as KN95 respirators, or to reuse decontaminated or bioburden-reduced disposable respirators.

The Emergency Use Authorizations for non-NIOSH-approved disposable respirators has ended.

Why Following the Guidelines Matters

All of these guidelines have been developed to protect your safety and health as well as that of your staff members and patients.

To ensure that healthcare practices are following these guidelines, OSHA has instituted a National Emphasis Program featuring enhanced enforcement efforts. OSHA inspectors will be looking at the extent to which employers are following OSHA standards as well as the most current guidelines from both OSHA and the CDC. So while these may technically be "guidelines," you may want to act as though they are "rules."

WHAT YOU NEED TO KNOW ABOUT MASK AND RESPIRATOR STANDARDS

Understanding the Main Types of Masks & Respirators

Types of Masks:

1. Face masks
2. Procedure masks
3. Surgical masks
4. Respirators

1. **Face masks** – The basic face masks that are now widely available for use by the general public during the COVID-19 pandemic are not intended for medical purposes.

2. **Procedure masks*** –Commonly found in many dental practices, procedure masks are often confused with surgical masks, although they provide a lower level of protection. Procedure masks are easily distinguished by the fact that they have ear loops instead of ties.

3. **Surgical masks*** – A loose-fitting mask that covers the user's nose and mouth and provides a physical barrier to fluids and particulate materials. Surgical masks are meant to provide fluid resistance and protection from large droplets and splashes or sprays of bodily fluids. They have ties for a tighter fit and to allow them to be worn over surgical hair coverings. Those intended for medical purposes are considered medical devices and PPE.

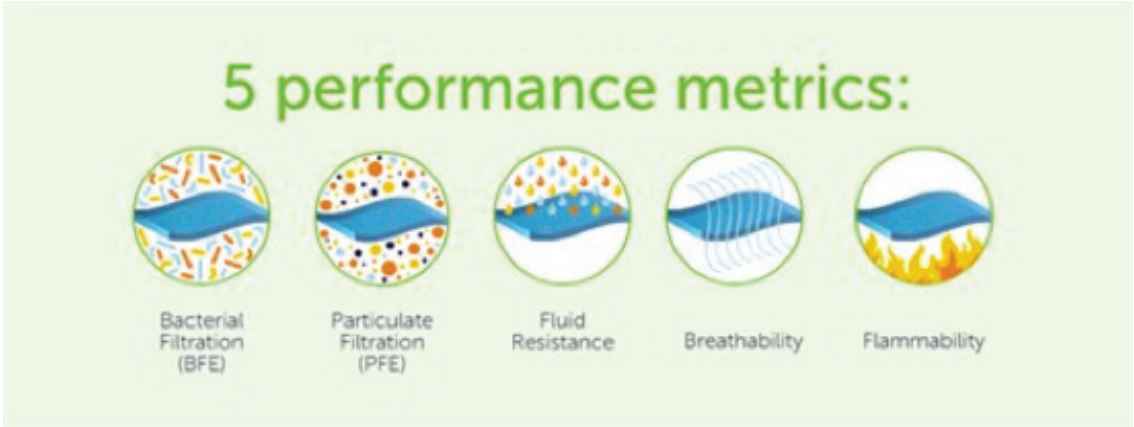
4. **Respirators*** – Also known as filtering facepiece respirators (FFRs), respirators—including N95s and surgical N95s—filter out at least 95% of airborne particles including both small particle aerosols and large droplets. They are PPE that tightly fits the face. When properly fit-tested, respirators provide a higher level of protection against viruses and bacteria.

* Be sure to read packaging labels to know you are getting the right protection. Refer to pages 8-12 of this eBook.

Masks are Measured on 5 Performance Metrics

In the U.S., NIOSH, the FDA and the American Society for Testing and Materials (ASTM) are all involved in setting standards for masks and respirators. ASTM provides ratings for masks based on ASTM Standard F2100-11, which is the recognized standard for medical face masks. This standard looks at five factors of respiratory protection:

1. **Fluid Resistance (FR)** – Does the mask's material and construction stop fluids from penetrating the mask?
2. **Bacterial Filtration Efficiency (BFE)** – What percentage of bacteria (i.e. live micro-organisms) larger than 3μ are filtered out by the mask? Note that SARS-CoV-2 (the COVID-19 virus) is 0.12 μ, which is smaller than what is measured by this metric.
3. **Particle Filtration Efficiency (PFE)** – What percentage of particles larger than 1 μ are filtered out by the mask?
4. **Breathability (Delta P – differential pressure)** – How great is the mask's resistance to air flow?
5. **Flammability** – Will the mask burn rapidly and spread flames?



In Dentistry, Fluid Resistance is Key

Blood seeping through the inside of face masks that are not ASTM rated.

Of the five mask performance metrics in the ASTM standard, fluid resistance is the most important one for dentistry. This is because fluid that penetrates the mask—such as blood, saliva and aerosols— can carry dangerous pathogens and infectious microbes. For example, just one milliliter of blood can contain viral counts of 1 million Hepatitis C particles or up to 1 *trillion* Hepatitis B particles.

This image illustrates how fluid that splatters on the outside of the mask or respirator can penetrate to the inside. Unfortunately, many of the masks frequently used in dental practices are not ASTM rated for fluid resistance.

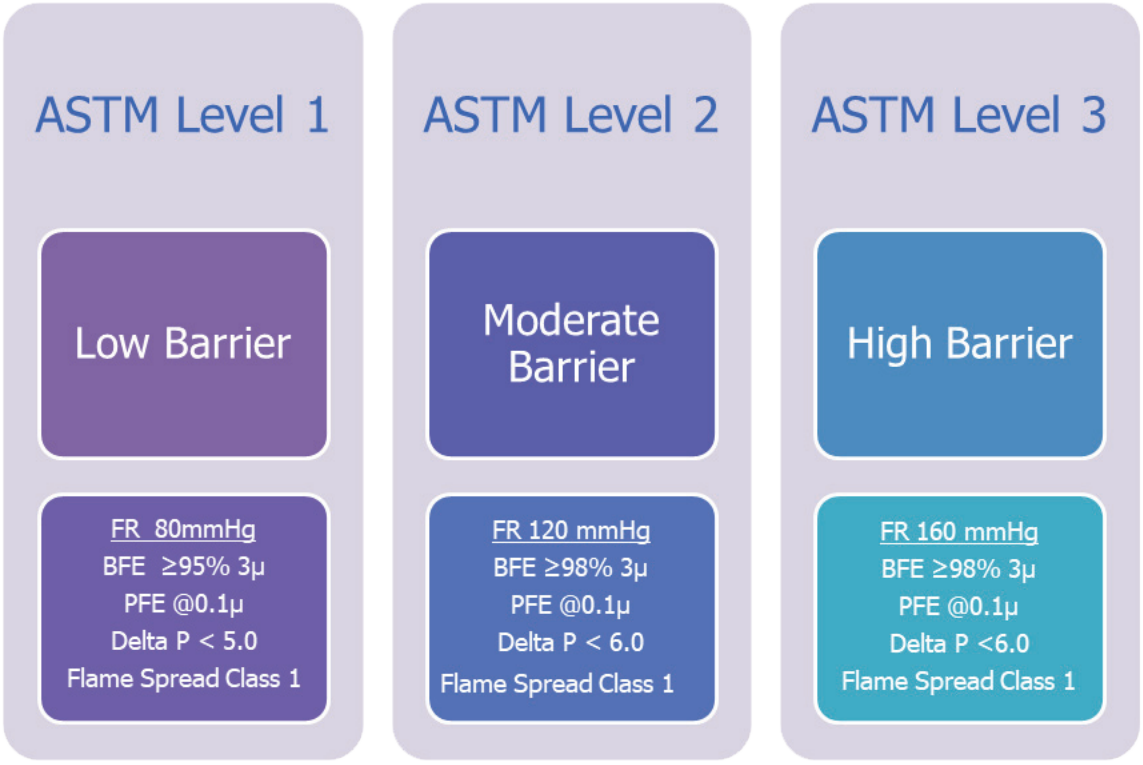
If fluid resistance is key, what about the other four factors? The bacterial filtration standards are looking for particles that are bigger than many of the things we are most concerned about. Particle filtration, which is more about dust and other larger, non-living particles, is more relevant for manufacturing environments. While breathability is certainly important, this is something you *can* get used to. As for flammability, there are not many reasons in dentistry to be putting your face near an open flame!

> Fluid that penetrates your mask can carry dangerous pathogens and infectious microbes.

Check the Package for the ASTM Rating

Once the ASTM evaluates how a mask does on the five performance metrics previously discussed, it then categorizes the mask as being Level 1, 2 or 3. The highest level of protection is provided by a Level 3 mask.

Naturally, lots of people strongly prefer the Level 1 masks, as their breathability (the lower Delta P in the chart below) and comfort is higher. Unfortunately, the reality is that Level 1 masks no longer have a place in a dental practice unless, perhaps, you're just protecting yourself from dust when working in the dental lab. Otherwise a Level 3 mask is what is most appropriate.



> The days of wearing ASTM Level 1 masks in dentistry are over.

HALYARD

HALYARD* LEADS THE WAY IN ASTM-RATED PROTECTION

HALYARD*, a world leader in face masks offers products that meet the ASTM F2100-11 standard at all levels. This helps you make sure you're protected appropriately for the fluid risk that may be present.

SOFTNESS & PROTECTION COME FACE TO FACE

Our FLUIDSHIELD* face masks feature our super soft SO SOFT* inner lining for more comfort.

MADE IN THE AMERICAS, FROM FABRIC TO FINISH

Unlike suppliers who rely on sources from Asia, all FLUIDSHIELD* Surgical N95s are manufactured here in the Americas for reliable supply every day.

THE NEW STANDARD

ASTM F2100-11 is the recognized consensus standard for medical face masks.

Masks are measured on
5 performance metrics:

MASKS ARE RATED ACCORDING TO PERFORMANCE LEVELS:

1	2	3
80 mm Hg	120 mm Hg	160 mm Hg
LOW	MODERATE	HIGH

Fluid Resistance

SOLUTION

HALYARD

All HALYARD* FLUIDSHIELD* Surgical and Procedure Masks are available in Levels 1, 2, and 3 and are fluid-resistant.

QUESTION YOUR PROTECTION

Get the full story and see the demo video at HalyardHealth.com/ASTMFaceMasks

Product Code	Description	Masks/ Box	Boxes/ Case
46727	**FLUIDSHIELD* N95 RESPIRATOR** Level 3 Splash-Resistant, NIOSH & FDA 510k Approved, Latex-Free, Regular Size	35	6
46827	**FLUIDSHIELD* N95 RESPIRATOR** Level 3 Splash-Resistant, NIOSH & FDA 510k Approved, Latex-Free, Small Size	35	6
47107	**LEVEL 3 FLUIDSHIELD* PROCEDURE MASK,** Fog-Free Procedure Mask with SO SOFT* Lining, Orange	40	10
47147	**LEVEL 3 FLUIDSHIELD* PROCEDURE MASK,** Fog-Free Procedure Mask with SO SOFT* Lining, Anti-Glare WrapAround Visor, Orange	25	4
25867	**LEVEL 1 FLUIDSHIELD* PROCEDURE MASK** Procedure Mask with SO SOFT* Lining, Yellow	50	10
41204	**GUARDALL SHIELD*,** Full Length Visor	40	1
41205	**GUARDALL SHIELD*,** 3/4 Length Visor	40	1

Contact your distributor rep today!
Visit www.products.halyardhealth.com

Things to Keep in Mind with Respirators

In many situations you should be using respirators. In this case there are a few things to be aware of:

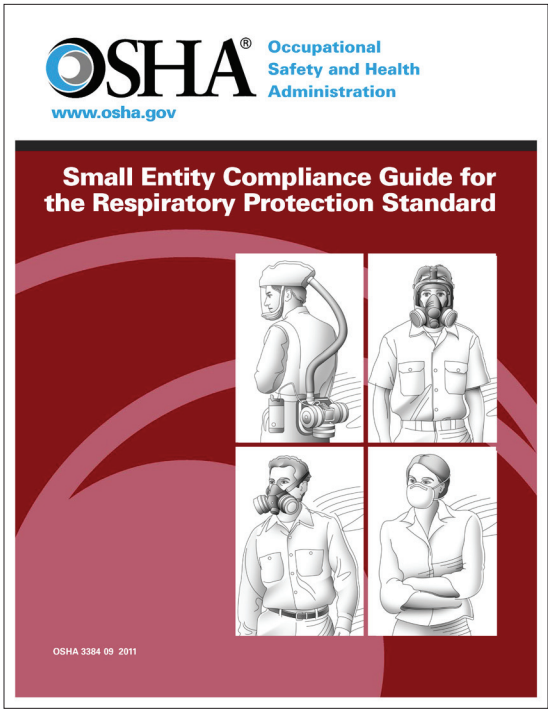
1. **Be sure to purchase medical grade or surgical N95 respirators.** Do not purchase manufacturing grade respirators. Surgical respirators are Class II devices regulated by the FDA and certified by CDC/NIOSH.

2. **Avoid respirators with exhalation valves.** These are not appropriate for use in any healthcare setting.

3. **Comply with OSHA's Respiratory Protection Standard.** Be aware that you must have a written compliance program for your practice and follow all of the guidance for medical evaluations, training, fit testing and so forth (see https://www.osha.gov/sites/default/files/publications/3384small-entity-for-respiratory-protection-standard-rev.pdf).

When using respirators:

- Look for medical or surgical grade
- Avoid exhalation valves
- Comply with OSHA Standards



Related Webinar
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