

Aerosols in Dentistry: The Continuing Story of Respiratory Protection



Mary Govoni, MBA, CDA, RDH

Support for this program provided by:



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The State of the Pandemic

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OSHA and CDC Updates

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FDA Updates

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Current Research on Infectious Aerosols

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Why Mask and Respirator Standards Matter

COVID-19 Pandemic Update

CDC COVID Data Tracker

Reported Cases

The current 7-day moving average of daily new cases (35,442) decreased 23.6% compared with the previous 7-day moving average (46,390). Compared with the highest peak on January 8, 2021 (250,037), the current 7-day average decreased 85.8%. A total of 32,643,851 COVID-19 cases have been reported as of May 12.

32,643,851
Total Cases Reported

35,442
Current 7-Day
Average*

46,390
Prior 7-Day Average

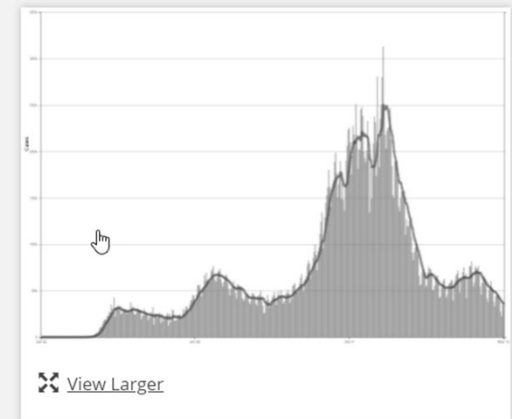
-23.6%
Change in 7-Day
Average since Prior
Week

*Historical cases are excluded from daily new cases and 7-day average calculations until they are incorporated into the dataset for the applicable date. Of 89,986 historical cases reported retroactively, 1,651 were reported in the current week and 1,649 were reported in the prior week.

Note: In the above table, historical data with missing report dates are excluded from current and prior 7-day averages, and the percent change in the 7-day average.

Daily Trends in COVID-19 Cases in the United States Reported to CDC

— 7-Day moving average



More Case Data

Source: CDC

COVID-19 Pandemic Update

State Profile Report

The State Profile Report (SPR) is generated by the Data Strategy and Execution Workgroup in the Joint Coordination Cell, in coordination with the White House. It is managed by an interagency team with representatives from multiple agencies and offices (including the United States Department of Health and Human Services, the Centers for Disease Control and Prevention, the Assistant Secretary for Preparedness and Response, and the Indian Health Service). The SPR provides easily interpretable information on key indicators for each state, down to the county level.

For each state, this report provides a weekly snapshot in time that:

- Focuses on recent outcomes in the last seven days and changes relative to the month prior
- Provides additional contextual information at the county level for each state, and includes national level information
- Supports rapid visual interpretation of results with color thresholds

[Click here to download the State Profile Report](#)

[View and Download COVID-19 Case Surveillance Publicly Available Data](#)

[CDC COVID Data Tracker](#)

Slide 5

M3

I will go to this website briefly during the webinar - just to give the viewers a taste of what info is available to them.


Mary, 4/21/2021

Updated CDC Guidance

Interim Public Health Recommendations for Fully Vaccinated People

Updated May 13, 2021 Languages ▾ Print

Summary of Recent Changes

Updates as of May 13, 2021 

- Update that fully vaccinated people no longer need to wear a mask or physically distance in any setting, except where required by federal, state, local, tribal, or territorial laws, rules, and regulations, including local business and workplace guidance
- Update that fully vaccinated people can refrain from testing following a known exposure unless they are residents or employees of a correctional or detention facility or a homeless shelter

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/fully-vaccinated-guidance.html>

Key Points

The following recommendations apply to non-healthcare settings. For related information for healthcare settings, visit [Updated Healthcare Infection Prevention and Control Recommendations in Response to COVID-19 Vaccination](#).

Fully vaccinated people can:

- Resume activities without wearing masks or physically distancing, except where required by federal, state, local, tribal, or territorial laws, rules and regulations, including local business and workplace guidance
- Resume domestic travel and refrain from testing before or after travel or self-quarantine after travel
- Refrain from testing before leaving the United States for international travel (unless required by the destination) and refrain from self-quarantine after arriving back in the United States
- Refrain from testing following a known exposure, if asymptomatic, with some exceptions for specific settings
- Refrain from quarantine following a known exposure if asymptomatic
- Refrain from routine screening testing if feasible

For now, fully vaccinated people should continue to:

- Get tested if experiencing [COVID-19 symptoms](#)
- Follow CDC and health department travel requirements and recommendations

Choosing Safer Activities

Source: <https://www.cdc.gov/media/releases/2021/s210601-covid-19-vaccination.html>

	Unvaccinated People	Examples of Activities	Fully Vaccinated People
High Risk	Not allowed	Outdoor Walk, run, wheelbarrow, or hike outdoors with members of your household	Allowed
Medium Risk	Not allowed	Attend a small, outdoor gathering with fully vaccinated family and friends	Allowed
Low Risk	Not allowed	Attend a small, outdoor gathering with fully vaccinated and unvaccinated people	Allowed
Lowest Risk	Allowed	Dine at an outdoor restaurant with friends from multiple households	Allowed
		Attend a crowded, outdoor event, like a live performance, parade, or sports event	Allowed
		Indoor	
High Risk	Not allowed	Visit a barber or hair salon	Allowed
Medium Risk	Not allowed	Go to an uncrowded, indoor shopping center or museum	Allowed
Low Risk	Not allowed	Ride public transport with limited occupancy	Allowed
Lowest Risk	Allowed	Attend a small, indoor gathering of fully vaccinated and unvaccinated people from multiple households	Allowed
		Go to an indoor movie theater	Allowed
		Attend a full capacity worship service	Allowed
		Sing in an indoor chorus	Allowed
		Eat at an indoor restaurant or bar	Allowed
		Participate in an indoor, high-intensity exercise class	Allowed

Get a COVID-19 vaccine

Prevention measures not needed

Key messages:

- Safety levels assume the unvaccinated population remains unvaccinated and that the individual with the most exposures
- CDC cannot provide the specific risk levels for many settings in many communities. It is important to consider your own personal health and safety in your own community and your own setting.

INFOGRAPHIC

If you are fully vaccinated you can start doing many things that you had stopped doing because of the pandemic.

[Text Version](#)

[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

Updated Healthcare Infection Prevention and Control Recommendations in Response to COVID-19 Vaccination

Updated Apr. 27, 2021 [Print](#)

CDC guidance for SARS-CoV-2 infection may be adapted by state and local health departments to respond to rapidly changing local circumstances.

Summary of Recent Changes

Updates as of April 27, 2021 



- Updated SARS-CoV-2 testing recommendations
- Updated visitation guidance to include recommendations for acute care facilities and to describe circumstances when source control and physical distancing are not required during visitation
- Added guidance for communal activities and dining in healthcare settings

Key Points

- CDC has updated select healthcare infection prevention and control recommendations in response to COVID-19 vaccination, which are summarized in this guidance.
- Updated recommendations on SARS-CoV-2 testing
- Updated recommendations will be added to this page regularly as new information becomes available.

5. Use of Personal Protective Equipment

- Recommendations for use of personal protective equipment by HCP remain unchanged.

Current CDC Guidance for Dental Settings

Guidance for Dental Settings

Interim Infection Prevention and Control Guidance for Dental Settings During the Coronavirus Disease 2019 (COVID-19) Pandemic

Updated Dec. 4, 2020 Print

Key Points

- Recognize dental settings have unique characteristics that warrant specific infection control considerations.
- Prioritize the most critical dental services and provide care in a way that minimizes harm to patients from delaying care and harm to personnel and patients from potential exposure to SARS-CoV-2 infection.
- Proactively communicate to both personnel and patients the need for them to stay at home if sick.
- Know the steps to take if a patient with [COVID-19 symptoms](#) enters your facility.

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html>

Additional Key Resources

- [Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 \(COVID-19\) Pandemic](#)
- [Framework for Healthcare Systems Providing Non-COVID-19 Clinical Care During the COVID-19 Pandemic](#)
- [Information about managing school sealant programs during COVID-19 on CDC's Considerations for School Sealant Programs page.](#)

Recent Study on COVID-19 and Aerosols



FOR IMMEDIATE RELEASE
May 12, 2021



CONTACT:
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media@iadr.org

<https://www.iadr.org/Portals/69/Press%20Release%20-%20JDR%20-%20Sources%20of%20SARS-CoV-2.pdf>

Only 28 individuals in the study –
may not be statistically significant

Were patients COVID-19+

Sources of SARS-CoV-2 and Other Microorganisms in Dental Aerosols

Alexandria, Va., USA — COVID-19 was declared a global pandemic in March 2020 and given an incomplete understanding of the transmission of SARS-CoV-2 at that time, the American Dental Association recommended that dental offices refrain from providing non-emergency services. As a result, 198,000 dentists in the United States closed their doors to patients. The study “Sources of SARS-CoV-2 and Other Microorganisms in Dental Aerosols,” published in the *Journal of Dental Research* (JDR), sought to inform infection-control science by identifying the source of bacteria and viruses in aerosol generating dental procedures.

Researchers at The Ohio State University College of Dentistry, Division of Periodontology, Columbus, USA, tracked the origins of microbiota in aerosols generated during treatment of 28 patients undergoing ultrasonic scaling, implant osteotomy or restorative procedures by combining reverse transcriptase qPCR, to identify and quantify SARS-CoV-2, and 16S sequencing, to characterize the entire microbiome, with fine-scale enumeration and source-tracking. Thirty minutes following the procedure, condensate was collected from the operator and assistant’s face shield, the patient’s chest and an area 6-feet distant from the site of operation.

The results show that it is possible to trace the source of contamination through DNA microbiome analysis and that the major source of microbes in aerosols came from the dental irrigant. Saliva did not significantly contribute as infection control measures such as pre-operative mouthrinses and intra-oral high-volume evacuation were used. The authors conclude that the risk for transmission of SARS-CoV-2 and other respiratory pathogens from aerosolized saliva in dental operatories is moderately low and that current infection control practices are adequately robust to protect personnel and patients alike.

“Understanding the sources of microbial load in aerosols is important, not only for infection control in dental operatories during the COVID pandemic, but also to inform best practices in aerosol reduction, mitigation and abatement in the long term.” said JDR Editor-in-Chief Nicholas Jakubovics, Newcastle University, England. “While further studies are needed with larger sample sizes, this study sets the stage for future work on risk of microbial transmission in oral health care settings.”

About the *Journal of Dental Research*

The IADR/AADR *Journal of Dental Research* (JDR) is a multidisciplinary journal dedicated to the dissemination of new knowledge in all sciences relevant to dentistry and the oral cavity and associated structures in health and disease. The JDR ranks #3 in Impact Factor of 91 journals, #2 without self-

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Alexandria, VA 22314-3406, USA
www.iadr.org • www.aadr.org

Current Guidance from OSHA on Respiratory Protection

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	
<i>Dental procedures not involving aerosol-generating procedures</i>	<i>Dental procedures that may or are known to generate aerosols</i>	<i>Dental procedures not involving aerosol-generating procedures</i>	<i>Dental procedures that may or are known to generate aerosols</i>	<i>Dental procedures not involving aerosol-generating procedures</i>	<i>Dental procedures that may or are known to generate aerosols</i>
<ul style="list-style-type: none"> 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.) 	<ul style="list-style-type: none"> 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† 	<ul style="list-style-type: none"> 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† 	<ul style="list-style-type: none"> Gloves Gown Eye protection (e.g., goggles, face shield) NIOSH-certified, disposable N95 filtering facepiece respirator or better† 	<ul style="list-style-type: none"> Gloves Gown Eye protection (e.g., goggles, face shield) NIOSH-certified, disposable N95 filtering facepiece respirator or better† 	<ul style="list-style-type: none"> Gloves Gown Eye protection (e.g., goggles, face shield) NIOSH-certified, disposable N95 filtering facepiece respirator or better†

[COVID-19 - Control and Prevention - Dentistry Workers and Employers | Occupational Safety and Health Administration \(osha.gov\)](https://www.osha-slc.gov/COVID-19-Control-and-Prevention-Dentistry-Workers-and-Employers-Occupational-Safety-and-Health-Administration-082020)

OSHA and the CDC



UNITED STATES
DEPARTMENT OF LABOR



Occupational Safety and Health Administration

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[Enforcement Memos](#) / [Updated Interim Enforcement Response Plan for Coronavirus Disease 2019 \(COVID-19\)](#)

U.S. Department of Labor

Occupational Safety and Health Administration
Washington, D.C. 20210
Reply to the attention of:



March 12, 2021

MEMORANDUM FOR: REGIONAL ADMINISTRATORS
STATE PLAN DESIGNEES

THROUGH AMANDA EDENS
Deputy Assistant Secretary

FROM: PATRICK J. KAPUST, Acting Director
Directorate of Enforcement Programs

SUBJECT: Updated Interim Enforcement Response Plan for Coronavirus Disease 2019 (COVID-19)

OSHA and the CDC

{Correction 3/30/2021}

Attachment 1

Specific Guidance for COVID-19 Enforcement

1. **Workplace Risk Levels:** To prioritize OSHA enforcement activities during the Coronavirus Disease 2019 (COVID-19) pandemic, the following guidance is provided to help CSHOs identify workplaces and job tasks with a risk-based potential for COVID-19 exposures. The risk of worker exposures to SARS-CoV-2, the virus that causes COVID-19, depends on numerous factors, including: the extent of community transmission; the type of work activity; the ability of workers to wear face coverings and appropriate personal protective equipment (PPE); the extent to which the employer follows OSHA standards and current guidelines from OSHA and the Centers for Disease Control and Prevention (CDC); and the need to work in close contact with other people, hereafter defined as within 6 feet for a total of 15 minutes or more over a 24-hour period, per the CDC.[3] Potential for worker exposures could also depend on medical or other measures present to control the impact of the virus and the implementation of those measures. For example, vaccinations are becoming increasingly available to certain groups of workers and others in the general population. Information on classifying risk of worker exposure is available on the Hazard Recognition page on OSHA's COVID-19 website. OSHA has also prepared guidance that employers should use for planning purposes - *Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace*.



COVID-19 / Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace

Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace

OSHA will update this guidance over time to reflect developments in science, best practices, and standards.

Guidance posted **January 29, 2021**

On this Page

- [Executive Summary](#)
- [Purpose](#)
- [About COVID-19](#)
- [What Workers Need To Know about COVID-19 Protections in the Workplace](#)
- [The Roles of Employers and Workers in Responding to COVID-19](#)
- [Additional Detail on Key Measures for Limiting the Spread](#)

<https://www.osha.gov/coronavirus/safework>

Small Entity Compliance Guide for the Respiratory Protection Standard



OSHA 3384 09 2011



OSHA DIRECTION

U.S. DEPARTMENT OF LABOR Occupational Safety and Health Administration

DIRECTIVE NUMBER: DIR 2021-01 (CPL-03) **EFFECTIVE DATE:** March 12, 2021
SUBJECT: National Emphasis Program – Coronavirus Disease 2019 (COVID-19)

ABSTRACT

Purpose:

This Direction describes policies and procedures for implementing a National Emphasis Program (NEP) to ensure that employees in high-hazard industries or work tasks are protected from the hazard of contracting SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), the cause of Coronavirus Disease 2019 (COVID-19). The NEP augments OSHA's efforts addressing unprogrammed COVID-19-related activities, e.g., complaints, referrals, and severe incident reports, by adding a component to target specific high-hazard industries or activities where this hazard is prevalent. The NEP targets establishments that have workers with increased potential exposure to this hazard, and that puts the largest number of workers at serious risk. In addition, this NEP includes an added focus to ensure that workers are protected from retaliation, and are accomplishing this by preventing retaliation where possible, distributing anti-retaliation information during inspections, and outreach opportunities, as well as promptly referring allegations of retaliation to the Whistleblower Protection Program.

Scope:

This Direction applies OSHA-wide.

References:

Presidential Executive Order on Protecting Worker Health and Safety, January 21, 2021.
Section 5(a)(1) of the Occupational Safety and Health Act (OSH Act), 29 U.S.C. § 654.
OSHA Instruction, CPL 02-00-164, Field Operations Manual (FOM), April 14, 2020.
OSHA Instruction, CPL 02-03-007, Whistleblower Investigations Manual, January 28, 2016.
OSHA Guidance, Protecting Workers: Guidance on Mitigating and Preventing the Spread of COVID-19 in the Workplace, January 29, 2021.
(See Section III for additional references.)

Cancellations:

None.

National Emphasis Program

Mar. 12, 2021 • Volume 20, Issue 6 • A twice monthly newsletter with information about workplace safety and health.

QuickTakes

50SHA
Protecting the American Workforce



National Emphasis Program

OSHA launched a national emphasis program to protect high-risk workers from COVID-19 hazards. The program also prioritizes employers that retaliate against workers who complain about unsafe or unhealthful conditions.



Photo: USDA

OSHA launches program to protect high-risk workers from coronavirus, focuses on employers that retaliate against workers with safety concerns | Occupational Safety and Health Administration

Important Dates for the COVID-19 National Emphasis Program

- Federal OSHA
- State Plans

MARCH 12, 2021

- NEP becomes effective
- Complaints/referrals and follow-up inspections begin

MARCH 26, 2021
(2 weeks after NEP)

- NEP targeting/programmed inspections begins

MAY 12, 2021
(60 days after NEP)

- State Plans inform OSHA of their intent

**AFTER
MAY 12, 2021**
(open-ended)

- If a State Plan adopts the NEP, they must submit documentation of their policy to OSHA within 60 days of adoption

**FDA Emergency Use
Authorizations
for Disposable Respirators**

N95 Respirators, Surgical Masks, and Face Masks



Recommendations

The FDA recommends that health care personnel and facilities:

- Limit decontamination of disposable respirators. Decontaminated respirators and respirators that have undergone bioburden reduction should be used only when there are insufficient supplies of new FFRs or if you are unable to obtain any new respirators.
- Transition away from a crisis capacity strategy for respirators, such as decontamination of N95 and other FFRs.
- Increase inventory of available NIOSH-approved respirators—including N95s and other FFRs, elastomeric respirators, including new elastomeric respirators without an exhalation valve that can be used in the operating room, and powered air-purifying respirators (PAPRs). Even if you are unable to obtain the respirator model that you would prefer, the FDA recommends that you obtain and use a new respirator before decontaminating or bioburden reducing a preferred disposable respirator.

[FDA Recommends Transition from Use of Decontaminated Disposable Respirators - Letter to Health Care Personnel and Facilities | FDA](#)

FDA Recommends Transition from Use of Decontaminated Disposable Respirators - Letter to Health Care Personnel and Facilities

Recommendations

The FDA recommends that health care personnel and facilities:

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- Increase inventory of available NIOSH-approved respirators—including N95s and other FFRs, elastomeric respirators, including new elastomeric respirators without an exhalation valve that can be used in the operating room, and powered air-purifying respirators (PAPRs). Even if you are unable to obtain the respirator model that you would prefer, the FDA recommends that you obtain and use a new respirator before decontaminating or bioburden reducing a preferred disposable respirator.

[FDA Recommends
Transition from Use of
Decontaminated
Disposable Respirators -
Letter to Health Care
Personnel and Facilities |
FDA](#)

**CONCERNS ABOUT INFECTIOUS
AEROSOLS ARE NOT LIMITED TO
COVID-19!**

Aerosol Transmitted Disease Risks in Dentistry

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

Jones RM, Brosseau LM. Aerosol transmission of infectious disease. *J Occup Environ Med.* 2015 May;57(5):501-8. doi: 10.1097/JOM.0000000000000448. PMID: 25816216.

California Code of Regulations, Title 8, Section 5199 Appendix A.

Kumar, S., & Lee, H. P. (2020). The perspective of fluid flow behavior of respiratory droplets and aerosols through the facemasks in context of SARS-CoV-2. *Physics of fluids (Woodbury, N.Y. : 1994)*, 32(11), 111301. <https://doi.org/10.1063/5.0029767>

The Basics on Face Masks, Surgical Masks, and Respirators

Q: Is there a difference between a face mask, a surgical mask, and a respirator? ^

A: Face masks, surgical masks, and respirators all cover a wearer's nose and mouth, but they differ in several aspects.

- **Face masks:** A mask, with or without a face shield, that covers the user's nose and mouth and may or may not meet fluid barrier or filtration efficiency levels. Face masks that are not intended for a medical purpose are not considered medical devices. Face masks may be used by the general public and health care personnel as source control in accordance with CDC recommendations on Interim Infection Prevention and Control.
- **Surgical masks:** A mask that covers the user's nose and mouth and provides a physical barrier to fluids and particulate materials. Surgical masks intended for medical purposes are considered medical devices. The mask meets certain fluid barrier protection standards and Class I or Class II flammability tests. Surgical masks are also tested for biocompatibility and are considered personal protective equipment (PPE). While a surgical mask may be effective in blocking splashes and large-particle droplets, they do not provide complete protection from germs and other contaminants because of the loose fit between the surface of the mask and your face. Surgical masks are not respiratory protective devices such as respirators.
- **Respirators, known as filtering facepiece respirators (FFRs),** including N95s and surgical N95s, filter at least 95 percent of airborne particles. They are PPE that tightly fit the face and provide certain filtration efficiency levels to help reduce wearer exposure to pathogenic airborne particles in a health care setting. They provide a higher level of protection against viruses and bacteria when properly fit-tested.

This CDC infographic (PDF - 227KB) explains the differences between surgical masks and N95 respirators.

[Face Masks, Including Surgical Masks, and Respirators for COVID-19 | FDA](#)

Understanding the Difference



Surgical Mask



N95 Respirator

Testing and Approval	Cleared by the U.S. Food and Drug Administration (FDA)	Evaluated, tested, and approved by NIOSH as per the requirements in 42 CFR Part 84
Intended Use and Purpose	Fluid resistant and provides the wearer protection against large droplets, splashes, or sprays of bodily or other hazardous fluids. Protects the patient from the wearer's respiratory emissions.	Reduces wearer's exposure to particles including small particle aerosols and large droplets (only non-oil aerosols).
Face Seal Fit	Loose-fitting	Tight-fitting
Fit Testing Requirement	No	Yes
User Seal Check Requirement	No	Yes. Required each time the respirator is donned (put on)
Filtration	Does NOT provide the wearer with a reliable level of protection from inhaling smaller airborne particles and is not considered respiratory protection	Filters out at least 95% of airborne particles including large and small particles
Leakage	Leakage occurs around the edge of the mask when user inhales	When properly fitted and donned, minimal leakage occurs around edges of the respirator when user inhales
Use Limitations	Disposable. Discard after each patient encounter.	Ideally should be discarded after each patient encounter and after aerosol-generating procedures. It should also be discarded when it becomes damaged or deformed; no longer forms an effective seal to the face; becomes wet or visibly dirty; breathing becomes difficult; or if it becomes contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients.



Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

Infographic - Understanding the Difference, Surgical Mask, N95 Respirator (cdc.gov)

Standards for Masks and Respirators

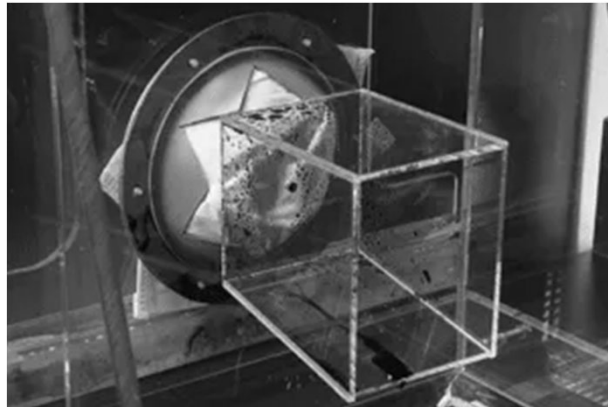
- NIOSH – National Institute for Occupational Safety and Health
– www.cdc.gov/niosh
- FDA – Food and Drug Administration
– www.fda.gov
- ASTM – American Society for Testing and Materials
– www.astm.org

Medical Masks – Procedure or Surgical

- Cleared by FDA for medical use – indicated on packaging
- May be procedure mask vs. surgical mask
 - Surgical masks have ties, not earloops
 - for tighter fit
 - to fit over hair coverings
- ASTM levels should be indicated on packaging

5 Factors in respiratory protection ASTM Standard F2100-11

- Fluid Resistance (FR) – measures the ability of mask's material and construction to minimize fluids from traveling through (penetrating) the material measured in mmHg



Source: Nelson Labs

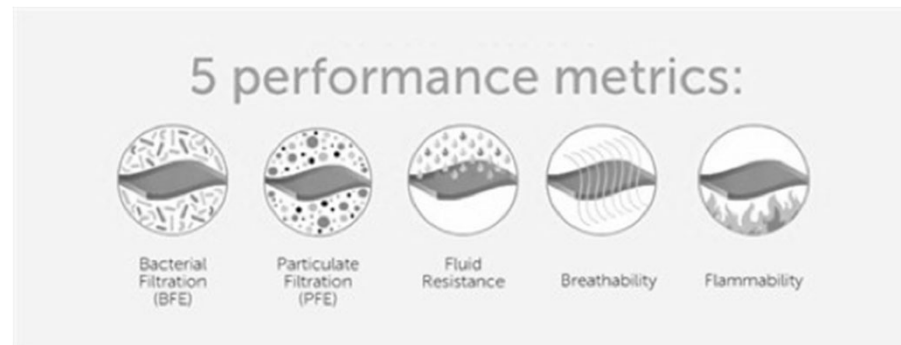
M9 Need to insert measurement for fluid resistance pressure/time
Mary, 5/14/2021

5 Factors in respiratory protection ASTM Standard F2100-11

- Bacterial Filtration Efficiency (BFE) – measures the percentage of bacteria larger than 3μ filtered out by the mask.
 - SARS-CoV2 is much smaller - $\sim .12\mu$
- Particle Filtration Efficiency (PFE) – measures the percentage of particles larger than 1μ

5 Factors in respiratory protection F2100-11

- Delta P (Differential Pressure) – resistance to air flow - breathability
- Flame spread – measure of the material's ability to burn rapidly and spread flames.



Source: Halyard Health

ASTM Level 1

Low Barrier

FR 80mmHg
BFE $\geq 95\%$ 3μ
PFE @ 0.1μ
Delta P < 4.0
Flame Spread Class 1

ASTM Level 2

Moderate
Barrier

FR 120 mmHg
BFE $\geq 98\%$ 3μ
PFE @ 0.1μ
Delta P < 5.0
Flame Spread Class 1

ASTM Level 3

High Barrier

FR 160 mmHg
BFE $\geq 98\%$ 3μ
PFE @ 0.1μ
Delta P < 5.0
Flame Spread Class 1

KNOW YOUR RISKS

PROBLEM

Studies show fluid strikes the face area of OR staff on average **45-51%** of the time¹



Over **70%** of masks are not ASTM F2100-11 rated for fluid resistance at all²

There is a **high cost** associated with infections which may include:



chronic disabilities



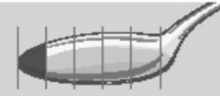
emotional stress



loss of income and/or employment



facility cost

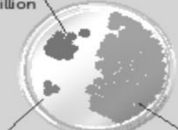


1 milliliter of blood = 5th of a teaspoon

Just **1 milliliter** of blood can contain virus counts that range from:³

HEPATITIS C

1 Million



HIV
10 - 1,000

HEPATITIS B
1 Million - 10 Trillion

THE NEW STANDARD

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

Masks are measured on **5 performance metrics:**



Bacterial Filtration (BFE)



Particulate Filtration (PFE)



Fluid Resistance



Breathability



Flammability

MASKS ARE RATED ACCORDING TO PERFORMANCE LEVELS:

1

80 mm Hg

LOW

2

120 mm Hg

MODERATE

3

160 mm Hg

HIGH

Fluid Resistance

SOLUTION



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

¹ CG Davies et al, Ann R Coll Surg Engl. 2007 89(8): 770-772; S Endo et al, Jour Hospital Infection 2007 65(1): 56-60; OC Berdy et al, Br J Surg 2005 80(11): 1376-80.
² CNR News 2004
³ Hesper, Journal of Biological Safety Assoc, 2000, 52(4): 53
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 P07A15505

What is the critical difference? Why should I care?

- Greatest difference is Fluid Resistance
 - 80mmHg (Level 1)
 - 160mmHg (Level 3)
 - Fluid penetrating the mask can carry infectious microbes



Source: Microsoft Creative Commons

Respirators

- N95 Filtering Facepiece Respirators (FFRs)
 - Commonly referred to as N95s
 - Medical grade vs. manufacturing grade
- Differ from masks in both fit, seal and particle filtration size
 - Some brands come in multiple sizes for better fit
- Designed for single use
 - Reuse allowed (temporarily) under FDA EUA
- Respirators with exhalation valves not appropriate for use in health care settings.

[N95 Respirators, Surgical Masks, and Face Masks | FDA](#)



Source: Halyard Health

Respirators in health care settings

- Surgical respirators are Class II devices regulated by the FDA
 - 21CFR 878.4040
- Certified by CDC/NIOSH
 - 42 CFR Part 84
- Manufactured in the Americas vs. overseas
 - Less wait time to replenish inventory
 - Not all respirators are created equal...

Buyer Beware!

Summary of the current state of respiratory protection requirements for dentistry

- OSHA bases respiratory protection guidance on:
 - The incidence of disease in your area
 - Type of procedure being performed
 - Aerosol generating vs. non-aerosol generating
- OSHA has cited practices for not utilizing N95s and not fit testing those respirators prior to use.
- OSHA is reviewing current guidance for update and has stated that aerosol-transmitted hazards are not addressed in the BBPS.

Summary of the current state of respiratory protection requirements for dentistry

- CDC has not updated guidance for dental settings since 12/20.
- CDC has updated guidance for health care settings on 4/27/21
 - Vaccination of HCW is not an indicator for discontinuing use of recommended respiratory protection
 - Vaccinated HCW's do not need to quarantine if exposed to COVID-19
 - Vaccinated HCW's do not need to be screened daily for COVID-19
 - Unvaccinated workers do need to quarantine and require daily screening

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