

A Strong OSHA Emergency Temporary Standard is Essential to an Effective and Successful Pandemic Response

Since the Covid-19 pandemic began in the United States in January 2020, our country has been in crisis. Despite clear scientific and public health consensus on interventions that could slow the spread of the virus and reduce illness, suffering, and death, the Trump Administration failed to take the necessary steps to control the pandemic.

Over a year into the worst public health crisis in recent history, nurses and other health care workers continue to care for Covid-19 patients and other patients without access to optimal personal protective equipment (PPE), testing, safe staffing levels, and other sound infection control policies. The federal Occupational Safety and Health Administration (OSHA) has repeatedly failed to hold employers accountable to providing safe workplaces during the pandemic citing the agency's lack of a standard on Covid-19.¹

Up to January 2021, the federal government's response to the pandemic has been one of denial and abandonment. President Biden recommitted to a strong, science-based pandemic response.

We were hopeful after the inauguration that we would quickly see changes to the federal government's response. But we have been disappointed that critical improvements have not yet been made to strengthen recommendations for protecting nurses and health care workers and that the OSHA Emergency Temporary Standard (ETS) has been indefinitely delayed past the March 15, 2021 deadline that President Biden gave in his Executive Order.

In order to bring Covid-19 under control, OSHA needs to issue a strong, science-based ETS on Covid-19 immediately, which will then improve the pandemic response on the ground in hospitals, workplaces, and communities across the country.

On behalf of more than 170,000 registered nurses, National Nurses United, the largest labor union and professional association for registered nurses in the United States, urges the White House, the Office of Management and Budget, and the Office of Information and Regulatory Affairs to complete the review of the OSHA ETS as quickly as possible and to ensure that OSHA issues a strong ETS that fully recognizes the scientific evidence regarding SARS-CoV-2, including the significant role aerosol transmission plays in the spread of Covid-19.

The following is a detailed outline of what a strong, science-based OSHA ETS on Covid-19 should include, of the scientific evidence and consensus around aerosol transmission and asymptomatic/presymptomatic transmission of SARS-CoV-2.

¹ For example, see Attachment 2 of Testimony of Pascaline Muhindura, RN, on Behalf of National Nurses United Before the Subcommittee on Workforce Protections, Committee on Education and Labor, March 11, 2021, <https://edlabor.house.gov/imo/media/doc/MuhinduraPascalineTestimony03112021.pdf>.

OSHA COVID-19 ETS for Health Care and First Response
Drafted by the AFL-CIO and affiliated unions
December 21, 2020

NNU Addendum to AFL-CIO ETS Draft

Note that the AFL-CIO draft OSHA ETS for health care and first response was drafted prior to roll out and availability of Covid-19 vaccines. A protective OSHA ETS on Covid-19 would address Covid-19 vaccines in the following ways:

1. Workplace protections, including PPE and testing, should not be predicated upon worker vaccination status. Covid-19 vaccines are highly effective at preventing moderate to severe Covid-19 infections, but their efficacy in preventing mild and asymptomatic Covid-19 infections remains unclear. Because even mild and asymptomatic infections may result in long-term health impacts,² and because circulating variants of concern may be or may become vaccine resistant,³ and because vaccines should always be utilized as part of the hierarchy of controls, measures that prevent transmission of this virus must be maintained regardless of vaccination status.
2. Similar to OSHA's Bloodborne Pathogens Standard, employers should be required to provide access to Covid-19 vaccines, at a time and place convenient to an employee's work site and schedule and without cost to the employee. Vaccinations should not be a condition of employment.

OSHA Covid-19 ETS for Health Care and First Response, as drafted by the AFL-CIO and affiliated unions

Section (a): Scope

(1) Each of the following health care facilities, services, or operations:

- (a) Hospitals
- (b) Skilled nursing facilities
- (c) Clinics, medical offices, and other outpatient medical facilities
- (d) Home health care
- (e) Long term health care facilities and hospices
- (f) Health care services in correctional facilities
- (g) Psychiatric hospitals
- (h) Medical outreach services
- (i) Drug treatment and rehabilitation facilities
- (j) Paramedic and emergency medical services including these services when provided by firefighters and other emergency responders

² Al-Aly, Z., Xie, Y., and B. Bowe, "High-dimensional characterization of post-acute sequelae of COVID-19," Nature, April 22, 2021, <https://www.nature.com/articles/s41586-021-03553-9>.

³ Centers for Disease Control and Prevention, "SARS-CoV-2 Variant Classifications and Definitions," updated May 5, 2021, <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html>.

- (k) Medical transport
- (l) Phlebotomy and blood donation locations
- (2) Facilities, services, or operations that are designated to receive persons arriving from the scene of an uncontrolled release of hazardous substances involving biological agents, as defined in 1910.120, Hazardous Waste Operations and Emergency Response, of these orders.
- (3) Police services, provided during transport or detention of persons reasonably anticipated to be cases or suspected cases of aerosol transmissible diseases; and police services provided in conjunction with health care or public health operations.
- (4) Public health services, such as communicable disease contact tracing or screening programs that are reasonably anticipated to be provided to cases or suspected cases of aerosol transmissible diseases, and public health services rendered in health care facilities or in connection with the provision of health care.

Section (b): Definitions

“Administrative Control” means any procedure which significantly limits daily exposure to SARS-CoV-2 virus and COVID-19 hazards and job tasks by control or modification of the work schedule or manner in which work is performed. The use of personal protective equipment is not considered a means of administrative control.

“Airborne infection isolation room (AIIR)”, formerly a negative pressure isolation room, means a single-occupancy patient-care room used to isolate persons with a suspected or confirmed airborne infectious disease. Environmental factors are controlled in AIIRs to minimize the transmission of infectious agents that are usually transmitted from person to person by droplet nuclei associated with coughing or aerosolization of contaminated fluids. AIIRs provide negative pressure in the room (so that air flows under the door gap into the room); and an air flow rate of 6-12 ACH (6 ACH for existing structures, 12 ACH for new construction or renovation); and direct exhaust of air from the room to the outside of the building or recirculation of air through a HEPA filter before returning to circulation.

“Authorized employee representative” means a labor organization that has a collective bargaining relationship with the cited employer and that represents affected employees.

“COVID-19” means Coronavirus Disease 2019, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

“COVID-19 case” means a person who:

- (1) Has a positive “COVID-19 test” as defined in this section;
- (2) Has been diagnosed with COVID-19 by a PLHCP;
- (3) Is subject to COVID-19-related order to isolate issued by a local or state health official; or
- (4) Has died due to COVID-19, in the determination of a local health authority or per inclusion in the COVID-19 statistics of a county.

“COVID-19 exposure” means contact with a COVID-19 case or suspected COVID-19 case or an individual who becomes a suspected or confirmed COVID-19 case and the contact had occurred

during the case's potentially infectious period. This definition applies regardless of the use of face coverings.

"COVID-19 hazards" means a workplace condition that creates exposure or potential exposure to potentially infectious material that may contain SARS-CoV-2, the virus that causes COVID-19. Potentially infectious materials include airborne droplets, small particle aerosols, and airborne droplet nuclei, which most commonly result from a person or persons exhaling, talking or vocalizing, coughing, sneezing, or procedures performed on persons which may aerosolize saliva or respiratory tract fluids, among other things. This also includes objects or surfaces that may be contaminated with SARS-CoV-2.

"COVID-19 symptoms" means fever of 100.4 degrees Fahrenheit or higher, chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, or diarrhea.

"COVID-19 test" means a viral test for SARS-CoV-2 that is:

- (1) Approved by the United States Food and Drug Administration (FDA) or has an Emergency Use Authorization from the FDA to diagnose current infection with the SARS-CoV-2 virus; and
- (2) Administered in accordance with the FDA approval or the FDA Emergency Use Authorization as applicable.

"Employee" means a person employed in a business of his or her employer. Reference to the term "employee" in this standard also includes, but is not limited to, temporary employees and other joint employment relationships, persons in supervisory or management positions with the employer.

"Engineering control" means the use of substitution, isolation, ventilation, or work station or equipment modification or redesign to reduce exposure to SARS-CoV-2 virus and COVID-19 disease related workplace hazards and job tasks.

"Exposed workplace" means any work location (fixed or non-fixed/mobile), working area, field work area, or common area at work used or accessed by a COVID-19 case or suspected COVID-19 case, including bathrooms, walkways, hallways, aisles, break area, locker rooms or eating areas, waiting areas, and vehicles. The exposed workplace does not include buildings or facilities not entered by a COVID-19 case.

"Face covering" means a tightly woven fabric or non-woven material with no visible holes or openings, which covers the nose and mouth. A face covering is not intended to protect the wearer, but it may reduce the spread of virus from the wearer to others. A face covering is not a surgical/medical procedure mask and is not subject to testing and approval by a state or government agency, so it is not considered a form of personal protective equipment or respiratory protection equipment under OSHA laws, rules, regulations, and standards.

"Face shield" means a form of personal protective equipment made of transparent, impermeable materials intended to protect the entire face or portions of it from droplets or splashes. Face

shields are not a form of source control and do not protect the wearer from aerosolized particles of SARS-CoV-2 nor prevent aerosolized particles from the wearer getting into the air. Face shields are not an adequate form of protection when worn alone and must be worn in combination with respirators, surgical/medical procedure masks or face coverings.

“Field work” means work in the field, such as work in other businesses and client’s homes. Examples of employees performing work in the field include, but are not limited to, visiting nurses, home health workers, and workers going into other facilities or businesses not operated by the employer (e.g., temporary blood donation sites), etc.

“Filtering facepiece respirator” means a negative pressure air purifying particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium. These are certified for use by the National Institute for Occupational Safety and Health (NIOSH).

“Fixed facility” means an establishment that does not move out of a single geographic location for the duration of the worker's shift.

“Non-fixed/mobile setting” means a place of employment outside of the areas of an employer’s fixed facility, where workers perform job tasks or congregate, such as transportation (operation or required by the job), mobile units for COVID-19 testing, blood donation and other medical services, break areas and other common areas. This includes temporary settings and vehicles.

“Occupational exposure” means exposure to a COVID-19 hazard which occurs or potentially may occur while at the work location, while engaged in work activities at another location or in transit while on the job.

“Personal protective equipment” means equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, biological or other workplace hazards. Personal protective equipment may include, but is not limited to, items such as gloves, safety glasses, shoes, earplugs or muffs, hard hats, respirators, surgical/medical procedure masks, gowns, face shields, coveralls, vests, and full body suits.

Physician or other licensed health care professional (PLHCP)” means an individual whose legally permitted scope or practice (i.e., license, registration, or certification) allows him or her to independently provide, or be delegated the responsibility to provide, some or all of the health care services required by this section

“Potentially infectious materials” means materials that cause COVID-19 include airborne droplets, small particle aerosols, and airborne droplet nuclei, which most commonly result from a person or persons exhaling, talking or vocalizing, coughing, sneezing, or procedures performed on persons which may aerosolize saliva or respiratory tract fluids that can contain SARS-CoV-2, among other things. This also includes objects or surfaces that may be contaminated with SARS-CoV-2.

“Respirator” means a protective device that covers the nose and mouth or the entire face or head to guard the wearer against hazardous atmospheres. Respirators are certified for use by the National Institute for Occupational Safety and Health (NIOSH). Respirators may be:

- A) Tight-fitting, that is, half masks, which cover the mouth and nose, and full face pieces that cover the face from the hairline to below the chin; or
- B) Loose-fitting, such as hoods or helmets that cover the head completely. There are two major classes of respirators:
 - 1. Air-purifying, which remove contaminants from the air; and
 - 2. Atmosphere-supplying, which provide clean, breathable air from an uncontaminated source. As a general rule, atmosphere-supplying respirators are used for more hazardous exposures.

“SARS-CoV-2” means Severe Acute Respiratory Syndrome coronavirus-2, which is a betacoronavirus, like MERS-CoV and SARS-CoV-1. Coronaviruses are named for the crown-like spikes on their surfaces. SARS-CoV-2 causes Coronavirus Disease 2019 (COVID-19).

“Surgical/medical procedure mask” means a mask to be worn over the wearer’s nose and mouth that is fluid resistant and provides the wearer protection against large droplets, splashes, or sprays of bodily or other hazardous fluids, and prevents the wearer from exposing others in the same fashion by protecting others from the wearer’s respiratory emissions. It has a loose fitting face seal. It does not provide the wearer with a reliable level of protection from inhaling smaller airborne particles. It is considered a form of personal protective equipment, but is not considered respiratory protection equipment under OSHA laws, rules, regulations, and standards. Testing and approval is cleared by the U.S. Food and Drug Administration (FDA).

“Source” means any person in a workplace including employees, vendors, contractors/subcontractors, clients, customers, or the public, that could be infected with and emit the SARS-CoV-2 virus. People infected with SARS-CoV-2 may not have any symptoms (presymptomatic or asymptomatic).

“Source control” means the use of protective equipment or other measures such as face coverings to prevent the spread of illness from a potentially infectious person to others. A typical example of source control for COVID-19 is to use a mask or face covering to limit the spread of respiratory droplets from the wearer to others. Respirators can be used as source control in addition to providing protection for the wearer.

“Suspected COVID-19 case” means a person that has COVID-19 symptoms but has not been tested for SARS-CoV-2, has not yet received a test result, or has received a negative test result and has signs and symptoms congruent with COVID-19 and history of exposure to a known case within the previous 14 days.

Section (c): COVID-19 Exposure and Infection Control Plan

- (1) The employer shall, with the participation of employees and their representatives, establish, implement, and maintain an effective, written COVID-19 Exposure Control

Plan (Plan) which is specific to the facility, and each unit, work area and operation(s), and which contains all of the elements in subsection (c)(3).

- (2) The employer shall designate a person as the administrator who will be responsible for the establishment, implementation, and maintenance of effective written infection control procedures to control the risk of transmission of SARS-CoV-2. The administrator shall have the authority to perform this function and shall be knowledgeable in infection control principles as they apply specifically to the facility, service, or operation. When the administrator is not on site, there shall be a designated person with full authority to act on his or her behalf.
- (3) The Plan shall contain all of the following elements:
 - (A) The name(s), job title(s), and contact information of the administration and designated person(s) responsible for administering the Plan.
 - (B) A list of all job classifications in which employees have occupational exposure to SARS-Cov-2 with the required personal protective equipment and respiratory protection.
 - (C) The methods of implementation of subsections (d), (e), (f), (g), (h), (i), (j), (k), (l) and (m) as they apply to that facility, service or work operation. Specific control measures shall be listed for each operation or work area in which occupational exposure occurs. These measures shall include applicable engineering and work practice controls, cleaning and disinfection procedures, and personal protective equipment and respiratory protection. .
 - (D) The procedures the employer will use to ensure that there is an adequate supply of personal protective equipment and other equipment necessary to minimize employee exposure
 - (E) The surge preparation and response procedures.
 - (F) Considerations for contingency plans for situations that may arise, such as:
 - i. Increased rates of employee absenteeism;
 - ii. Options for conducting essential operations with a reduced workforce, including cross-training employees across different jobs in order to continue operations or deliver surge services; and
 - iii. Interrupted supply chains or delayed deliveries.
- (4) The effectiveness of the Plan shall be reviewed in conjunction with employees and their representatives regarding the effectiveness of the program in their respective work areas. Deficiencies found shall be corrected. The review(s) shall be documented in writing, in accordance with subsection (c)(1).
 - (A) The Plan shall be reviewed:
 - i. At least every three (3) months;
 - ii. If a workplace outbreak is identified; and
 - iii. Whenever necessary to reflect new or modified tasks, procedures, or equipment supply which affect occupational exposure and to reflect new or revised employee positions with occupational exposure by the program administrator.
 - (B) The review and update of such plans shall also reflect:

- i. Changes in appropriate commercially available and effective control technologies that eliminate or reduce exposure to COVID-19 (i.e., engineering controls, NIOSH-approved respiratory protection) and document consideration and implementation of such available control technologies; and
 - ii. Updated federal, state, local, and other infection control guidelines, where they recommend a higher level of protection than this standard, or medical advances that prevent or minimize transmission of COVID-19.
- (5) The Plan shall address infectious disease preparedness and response with outside businesses, including, but not limited to, contractors, vendors, licensed independent practitioners with privileges, businesses that provide or contract or temporary employees to the employer, as well as other persons accessing the place of employment, to comply with the requirements of this standard and the employer's plan.
- (6) Exposure Determination:
 - (A) The employer shall conduct a workplace-specific identification of all interactions, areas, activities, processes, equipment, and materials that could potentially expose employees to COVID-19 hazards. Employers shall treat all patients and the public, regardless of symptoms or negative COVID-19 test results, as potentially infectious. These procedures shall include, but are not limited to:
 - i. Identification and evaluation of employees' potential occupational exposure to all persons at the workplace who may enter the workplace, including patients, customers or clients, coworkers, employees of other entities, members of the public, and independent contractors.
 - ii. Evaluation of the work environment (e.g. indoors or outdoors) regardless of whether employees are performing an assigned work task or not, for instance during meetings or trainings and including in and around entrances, bathrooms, hallways, aisles, walkways, elevators, break or eating areas, cool-down areas, waiting areas, loading/unloading and other transportation areas, and cooking and other communal areas; the known or suspected presence of the SARS-CoV-2 virus; the presence of a COVID-19 case or suspected COVID-19 case; the number of employees and/or other persons in relation to the size of the work area; the distance between employees and other employees or persons; the duration and frequency of employee exposure through contact with other employees or persons (e.g., including shift work exceeding 8 hours per day);
 - iii. Assessment of the type of hazards encountered, including exposure to the airborne transmission of SARS-CoV-2 virus; contact with contaminated surfaces or objects, such as tools, workstations, or break room tables, and shared spaces such as shared workstations, break rooms, locker rooms, and entrances/exits to the facility; travel through the workplace; shared work vehicles; industries or places of employment when employer

sponsored shared transportation is a common practice, such as ride-share vans or shuttle vehicles, car-pools, and public transportation, etc.

(B) The employer shall evaluate existing COVID-19 prevention controls at the workplace and the need for different or additional controls. This includes evaluation of controls in section (e).

(C) Field work. Employers shall develop methods for assessing the potential for exposure of employees to known or suspected sources of SARS-CoV-2 when employees perform work in the field, as well as methods to prevent exposure of employees performing field work according to subsection (e)(4).

- (i) Prior to any work at a field location the employer shall conduct a pre-job survey to evaluate the potential risk of exposure to SARS-CoV-2 which can include work in indoor locations with other persons in the vicinity of the work, close contact with other people, high density of people in or near the work area, contact with the general public, high-risk workplaces or a local area is experiencing either a sustained elevated community transmission or a resurgence in community transmission.
 - a. The pre-job survey shall be conducted prior to dispatch to the work location. Employees shall not be dispatched to locations with a risk of exposure to SARS-CoV-2 without adequate protections.
 - b. The pre-job survey should include a patient screening questionnaire regarding potential SARS-CoV-2 exposures and COVID-19 symptoms.
 - c. When the pre-job survey does not reveal enough information to determine the risk of exposure to SARS-CoV-2 at the work location, or if occupational exposure is identified, employers shall prioritize alternative ways to provide the work or service. If alternative ways to conduct the work or provide the service are not possible, respirators (e.g., N-95 filtering facepiece respirators) and other appropriate PPE shall be provided.
- (ii) During onsite work, including onsite inspections, each employer shall ensure employees conduct a pre-job assessment when at the worksite to determine if any of the conditions identified during the initial pre-job survey have changed or present a greater risk than identified during the initial pre-job-survey to determine additional control measures needed to minimize exposure to any COVID-19

hazards not previously identified and determine whether the site conditions are safe to perform their work..

Section (d): Employee Participation

- (1) Employers shall develop and implement a written plan of action regarding the implementation of the employee participation required by this section.
 - (a) Employers shall consult with employees and their authorized representatives, including soliciting and obtaining input identifying those situations in the workplace with occupational exposure, developing, implementing and reviewing the effectiveness of the exposure determination and COVID-19 infection control plan, ensuring employee participation is representative of the job tasks and COVID-19 hazards in the workplace.
 - (b) Employers shall provide to employees and their representatives access to hazard analyses, controls, and all other information required under this standard.
- (2) Employers shall make available to affected employees and their authorized representatives all information required to be developed by this standard, including the plan, upon request in electronic and hard copy. The plan must be available at the worksite for employees at all times.

Section (e): Operating Procedures (Control Measures)

- (1) The employer shall develop and implement a process for medical screening and surveillance according to section (f).
- (2) The employer shall establish and implement procedures for identifying and isolating COVID-19 cases and suspected COVID-19 cases among patients upon arrival. These procedures shall include the methods the employer will use to limit employee exposure to these persons during periods when they are not in airborne infection isolation rooms or areas.
 - (a) All patients shall be considered possible Covid-19 cases until confirmed or confidently ruled out.
 - (b) All exposure history from the previous 14 days (e.g., contact with a Covid-19 case, recent travel, or other possible exposure), clinical signs and symptoms, and diagnostic testing shall be considered when screening patients.
 - (c) All patients shall be tested prior to admission. A negative diagnostic test shall not be sufficient to rule out Covid-19.
 - (d) Patients for whom COVID-19 is suspected but not yet confirmed or ruled out should have the same precautions as confirmed Covid-19 patients.
 - (e) Isolation precautions for COVID-positive patients shall only be removed when the COVID-positive patient has been confirmed to be no longer actively shedding virus and no longer potentially infectious by having at least two negative tests 24 hours apart.

- (3) System for communicating. The employer shall do all of the following in a form readily understandable by employees:
- (a) Ask employees to report to the employer, without fear of reprisal, COVID-19 symptoms, possible COVID-19 exposures, and possible COVID-19 hazards at the workplace.
 - (b) Describe procedures or policies for accommodating employees with medical or other conditions that put them at increased risk of severe COVID-19 illness.
 - (c) Describe procedures the employer will use to communicate with its employees and other employers regarding the suspected or confirmed infectious disease status of persons to whom employees are exposed in the course of their duties.
 - (d) Describe procedures the employer will use to communicate with other employers regarding exposure incidents, including procedures for providing or receiving notification to and from health care providers about the disease status of referred or transferred patients.
 - (e) A description of the source control measures to be implemented in the facility, service or operation, and the method of informing people entering the work setting of the source control measures.
 - (f) Provide information about access to COVID-19 testing. If testing is required to be provided to an employee, the employer shall inform affected employees of the reason for the COVID-19 testing and the possible consequences of a positive test.
 - (g) In accordance with subsection (e)(3), communicate information about COVID-19 hazards and the employer's COVID-19 policies and procedures to employees and to other employers, persons, and entities within or in contact with the employer's workplace.
- (4) Workplace control measures.
- (a) Employers shall develop and implement procedures for the use of engineering, administrative and work practice controls in accordance with this section and in such a way that effectively addresses employee exposures to all routes of transmission causing COVID-19.
 - (b) Employers shall utilize engineering and work practice controls to minimize employee exposures to SARS-CoV-2. Where engineering and work practice controls do not provide sufficient protection (e.g., when an employee enters an AII room or area) the employer shall provide, and ensure that employees use, personal protective equipment, and shall provide respiratory protection in accordance with subsection (e)(4)(g).
 - (c) Employers shall implement the following engineering controls:

- (i) Establish dedicated and separate areas to prevent transmission, including three separate zones within fixed facilities:⁴
 - (1) COVID-19-positive zone for confirmed COVID-19 case patients.
 - (2) Potentially infectious zone for all patients who have not yet been confirmed as a COVID-19 case or ruled out as non-COVID-19 patients.
 - (3) Non-COVID-19 zone for patients who have been ruled out as non-COVID-19 patients using testing, symptom screening, and exposure history according to section (e)(2).
- (ii) Isolation rooms and ventilation: COVID-19 cases and suspected COVID-19 cases shall be placed in airborne infection isolation rooms or areas until determined no longer to be a COVID-19 case or suspected case. Facilities shall convert additional rooms, units, and floors to negative pressure as needed.⁵
 - (1) Comply with minimum American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 170-2017, which includes requirements for ventilation in health care facilities. Based on risk assessments or owner project requirements, designers of new and existing facilities can go beyond the minimum requirements of these standards.
 - (2) Negative pressure shall be maintained in AII rooms or areas. The ventilation rate shall be 12 or more air changes per hour (ACH). The required ventilation rate may be achieved in part by using in-room high efficiency particulate air (HEPA) filtration or other air cleaning technologies, but in no case shall the outdoor air supply ventilation rate be less than six ACH.
 - (3) Negative pressure shall be visually demonstrated by smoke trails or equally effective means daily while a room or area is in use for AII.
 - (4) Engineering controls shall be maintained, inspected and performance monitored for exhaust or recirculation filter loading and leakage at least annually, whenever filters are changed, and more often if necessary to maintain effectiveness. Where UVGI is

⁴ When patients who do not have Covid-19 are mixed with confirmed and possible Covid-19 patients, the potential for transmission of the virus to patients and staff increases significantly. Separate areas are necessary in all areas of the hospital, including inpatient units, emergency departments, labor and delivery, and procedural areas.

⁵ Airborne infection isolation rooms reduce the possibility that infectious viral particles will be transported to other areas of the facility.

used, it shall be used, maintained, inspected and controlled in accordance with the manufacturer's instructions. Problems found shall be corrected in a reasonable period of time. If the problem(s) prevent the room from providing effective AII, then the room shall not be used for that purpose until the condition is corrected.

- (5) Air from AII rooms or areas, and areas that are connected via plenums or other shared air spaces shall be exhausted directly outside, away from intake vents, employees, and the general public. Air that cannot be exhausted in such a manner or that must be recirculated must pass through HEPA filters before discharge or recirculation.
 - (6) Ducts carrying air that may reasonably be anticipated to contain aerosolized SARS-CoV-2 shall be maintained under negative pressure for their entire length before in-duct HEPA filtration or until the ducts exit the building for discharge.
 - (7) Doors and windows of AII rooms or areas shall be kept closed while in use for airborne infection isolation, except when doors are opened for entering or exiting and when windows are part of the ventilation system being used to achieve negative pressure.
 - (8) When a COVID-19 case or suspected COVID-19 case vacates an AII room or area, the room or area shall be ventilated for a removal efficiency of 99.9% before permitting employees to enter without respiratory protection.
- (iii) Provide local exhaust ventilation, including hoods, headboards, booths, tents and other local exhaust control measures.
 - (iv) General ventilation. Ensure that air-handling systems where installed, with exception to AII rooms and areas which are subject to requirements under paragraphs (e)(4)(a)(ii), are appropriate to address the SARS-CoV-2 virus and COVID-19 disease related hazards and job tasks that occur at the workplace:
 - (a) Are assessed, maintained, adjusted and repaired by qualified HVAC technicians, in accordance with the manufacturer's instructions,
 - (b) Use the maximum MERV rating air filter appropriate for the system, that are maintained and replaced to ensure proper function of the system,
 - (c) All intake ports that provide outdoor or fresh air to the HVAC system are cleaned, maintained, and cleared of any debris that may affect the function and performance of the system, and

- (d) Comply with minimum American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standards 62.1 and 62.2 (ASHRAE 2019a, 2019b), which include requirements for outdoor air ventilation in most residential and nonresidential spaces, Standards 161-2018, which include requirements for air quality within commercial aircraft, and other relevant ANSI/ASHRAE standards. Based on risk assessments or owner project requirements, designers of new and existing facilities can go beyond the minimum requirements of these standards.
- (v) Provide standalone filtration units (e.g., high efficiency particulate air (HEPA) filtration units) when the HVAC system specifications are not sufficient to minimize recirculated air (non-fixed settings, where no HVAC is installed and where additional circulation and filtration are needed, such as break rooms, or in temporary spaces). Standalone units:
 - (a) Shall not create a hazard;
 - (b) Shall be of sufficient quantity and filtration ability to be effective in the space it is used.
- (vi) If applicable, monitor carbon dioxide levels as an indicator of air quality and changes in ventilation.
- (vii) Where UVGI is used, it shall be used, maintained, inspected and controlled in accordance with the manufacturer's instructions.
- (d) Employers shall implement the following administrative controls:
 - (i) Employers shall establish an opt-out process for employees at higher risk of complications from COVID-19 such as older adults, people who have serious chronic medical conditions, and pregnant workers.
 - (ii) Employers shall develop and implement effective measures to prevent introduction of the SARS-CoV-2 virus to the facility, in addition to screening all patients for SARS-CoV-2 infection (see paragraph (e)(2). These measures include visitor restrictions and visitor screening.
 - (iii) In first response settings, implement dispatch protocols warning providers of known or suspected COVID-19 patients and limiting the number of firefighters and EMS personnel having contact with each confirmed or suspected patient.
 - (iv) Employers shall ensure safe staffing levels at all times, including:
 - (1) The development and implementation of floating standards which ensure nurses are not assigned tasks in work areas which are not within their typical area of expertise without in-person and hands-on education.

- (2) Patient assignments that prevent the potential for transmission between patients and staff, including assignments that do not mix COVID-19 cases, suspected COVID-19 cases and non-COVID-19 patients.
- (3) Reduce shift hours in COVID-19 positive zones and infectious zones.⁶
- (v) Implement measures that reduce or eliminate contact between employees, such as flexible worksites (e.g., telework), flexible work hours (e.g., staggered shifts), flexible meeting and travel options (e.g., using telephone or video conferencing instead of in person meetings; postponing non-essential travel or events; etc.), providing services or products remotely (e.g. phone, video, internet, curbside pick-up, delivery, etc.).
- (vi) Frequent breaks to prevent respirator use fatigue and skin injuries (e.g., a 15-minute break every two hours.⁷
- (vii) Physical distancing. All employees shall be separated from other persons, at least six feet, except when performing direct patient care. Methods of physical distancing include: reducing the number of persons in an area at one time, including visitors; visual cues such as signs and floor markings to indicate where employees and others should be located or their direction and path of travel; staggered arrival, departure, work, and break times; and adjusted work processes or procedures to allow greater distance between other employees, patients, and the public.
- (viii) Implement measures that reduce occupancy, such as by staggering/altering shifts, work hours, and limiting the number of public customers, clients, and visitors. Physical distancing is not a substitute for reducing occupancy.
- (ix) Barriers.
 - (1) Install cleanable solid partitions that effectively reduce transmission between the employee and other persons, without inhibiting ventilation.
- (e) Environmental Cleaning and Disinfection. Employers shall develop and implement effective housekeeping and environmental cleaning and disinfection protocols and plans for work areas, including facilities, common areas, public areas, equipment and vehicles.

⁶ Internationally, shifts in dedicated Covid-19 units have been four hours long.

⁷ NIOSH-approved N95 filtering facepiece and other tight-fitting respirators, exerts pressure on the skin, which can lead to damage to the skin integrity and skin injuries.

- (1) Cleaning and disinfection of all potentially exposed work areas, common and public spaces must occur following identification of a suspected COVID-19 case or COVID-19 case.
- (2) Cleaning and disinfection must occur in all potentially exposed work areas, common and public spaces if a patient COVID-19 case or suspected COVID-19 case travels outside of an AII room or area.
- (3) For fixed facilities, employers shall provide temporary scrubs and facilities to shower and change before going off duty for employees who have occupational exposure.
- (4) Identifying and regularly cleaning and disinfecting frequently touched surfaces and objects, such as doorknobs, elevator buttons, equipment, tools, handrails, handles, controls, bathroom surfaces, common use pens, and steering wheels. The employer shall inform employees and authorized employee representatives of cleaning and disinfection protocols, including the planned frequency and scope of regular cleaning and disinfection.
- (5) Prohibiting the sharing between users of personal protective equipment and items that employees come in regular physical contact with such as phones, headsets, desks, keyboards, writing materials, instruments, and tools. When it is not feasible to prevent sharing, sharing shall be minimized and such items and equipment shall be disinfected between uses by different people. Sharing of vehicles shall be minimized, and high touch points (steering wheel, door handles, seatbelt buckles, armrests, shifter, etc.) shall be disinfected between users.
 - (a) Ensuring all used, disposable PPE and disinfection waste on site is disposed of immediately or bagged and disposed of later.
 - (b) Ensuring the use of only disinfecting chemicals and products indicated in the Environmental Protection Agency (EPA) List N for use against SARS-CoV-2.
 - (c) Ensuring that the manufacturer's instructions for use of all disinfecting chemicals and products are complied with (e.g., concentration, application method, contact time, PPE, etc.) and ensuring compliance with 1910.1200.

NOTE: Cleaning and disinfecting must be done in a manner that does not create a hazard to employees.

- (6) To protect employees from COVID-19 hazards, the employer shall evaluate its handwashing facilities, determine the need for additional facilities, encourage and allow time for employee handwashing, and provide employees with an effective hand sanitizer. Employers shall encourage employees to wash their hands for at least 20 seconds each time. Provision or use of hand sanitizers with methyl alcohol is prohibited.

- (f) Signage and labeling/color-coding. Employers shall develop procedures for the use of signage and labeling/color-coding to convey an appropriate COVID-19 hazard/zone warning to employees throughout the employer's work settings. The procedures must include a COVID-19 hazard warning to employees outside the employer's work setting, when such employees may be exposed to contaminated materials originating from the employer's work setting (e.g., specimens, equipment, laundry) during collection, handling, processing, storage, transport, shipping, and disposal activities.
- (g) Personal protective equipment:
 - (i) Employers shall select, provide, and make immediately accessible at all times personal protective equipment to all employees who have or are reasonably anticipated to have an occupational exposure. The personal protective equipment must provide protection from the SARS-CoV-2 virus and meets the requirements of §1910.132 (General requirements) and §1910.134 (Respiratory protection),⁸ including, but not limited to:⁹
 - (1) Coveralls that are fluid resistant and impervious to viral penetration (under ASTM F1671/ISO 16604);
 - (2) Isolation gowns;
 - (3) Eye protection (e.g., goggles, face shields);
 - (4) Medical grade gloves;
 - (5) Head coverings;
 - (6) Shoe coverings;
 - (7) Surgical/medical procedure masks; and
 - (8) Respiratory protection.
 - (a) Each employer who has an employee with potential occupational exposure shall establish, implement, and maintain an effective written respiratory protection program that meets the requirements of 29 CFR 1910.134,

⁸Health care workers who must respond to sudden emergencies such as cardiac or respiratory arrest in patients who are suspected or confirmed cases of COVID-19 need immediate access to PPE.

⁹ Optimal PPE standard: NIOSH-approved powered air-purifying respirator (PAPR), coveralls that are fluid resistant and impervious to viral penetration (meeting ASTM F1671/ISO 16604 standards) and incorporate head and shoe coverings, and medical-grade gloves.

Minimum PPE standard: NIOSH-approved N95 filtering facepiece respirator (single use), eye protection (goggles or face shield), and isolation gown that is at least fluid resistant, and medical-grade gloves. Under no circumstances should health care workers be provided less than the minimum PPE standard when interacting with suspected or confirmed Covid-19 patients or individuals who have not yet been screened for Covid-19

and shall provide NIOSH-approved respiratory protection to each employee with potential occupational exposure, including, but not limited to, employees who conduct work tasks involving:

- (i) Entering an airborne infection isolation room or area in use for airborne infection isolation;
 - (ii) Presence during the performance of procedures or services for a confirmed or suspected Covid-19 case;
 - (iii) Repairing, replacing, or maintaining air systems or equipment that may contain or generate aerosolized SARS-CoV-2;
 - (iv) Working in an area occupied by a confirmed or suspected Covid-19 case or during decontamination procedures after the person has left the area;
 - (v) Working in a residence where a confirmed or suspected Covid-19 case is known to be present;
 - (vi) Presence during the performance of aerosol generating procedures on cadavers that are suspected of, or confirmed as, being infected with SARS-CoV-2;
 - (vii) Performing a task for which the Plan requires the use of respirators; or
 - (viii) Transporting a confirmed or suspected Covid-19 case within the facility or in an enclosed vehicle (e.g., van, car, ambulance or helicopter).
 - (ix) Conducting screening for symptoms of COVID-19 of employees entering the workplace.
- (b) Respirators provided for compliance with this section shall be approved by NIOSH for the purpose for which they are used.
- (i) Disposable equipment (e.g., N-95s and other disposable PPE) that has been donned and doffed once and shall be disposed of and shall not be reused. Reuse of N-95s negates NIOSH-approval¹⁰

¹⁰ PPE becomes contaminated during use and repeated donning of contaminated PPE poses risk of exposure to staff. Single-use PPE can become damaged during reuse and may no longer provide protection.

OSHA COVID-19 ETS for Health Care and First Response
Drafted by the AFL-CIO and affiliated unions
December 21, 2020

- (ii) Decontamination of disposable equipment, including N-95s and other disposable PPE, is prohibited and negates NIOSH-approval.¹¹
 - (iii) A surgical mask/medical procedure mask or face covering are not considered respiratory protection.
- (c) Employers shall implement the use of more protective respirators designed to be safely reused such as NIOSH-approved elastomeric respirators and PAPRs.
- (d) Medical evaluation: The employer shall provide a medical evaluation, in accordance with Section 1910.134(e) of these orders, to determine the employee's ability to use a respirator before the employee is fit tested or required to use the respirator.
- (e) Fit testing. The employer shall perform either quantitative or qualitative fit tests in accordance with the procedures outlined in Appendix A of 1910.134, Respiratory Protection, of these orders. The fit test shall be performed on the same size, make, model and style of respirator as the employee will use. When quantitative fit testing is performed, the employer shall not permit an employee to wear a filtering facepiece respirator or other half-facepiece respirator, unless a minimum fit factor of one hundred (100) is obtained. When fit testing single use respirators, a new respirator shall be used for each employee.
 - (i) The employer shall ensure that each employee who is assigned to use a filtering facepiece or other tight-fitting respirator passes a fit test:
 - (1) At the time of initial fitting;
 - (2) When a different size, make, model or style of respirator is used; and
 - (3) At least annually thereafter.
 - (ii) If, after passing a fit test, the employee subsequently notifies the employer, program administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable, the employee shall be

¹¹ No decontamination has been shown to be both safe and effective and there is evidence indicating that several methods are ineffective, damage N95s, or introduce a new hazard to wearers.

given a reasonable opportunity to select a different respirator facepiece and to be retested.

- (iii) The employer shall ensure that each respirator user is provided with initial and annual training in accordance with 1910.134, Respiratory Protection of these orders. Training shall include hands-on practice with procedures to properly don and doff respiratory protection to reduce the risk of cross-contamination and transmission, and will be conducted with make and model of the respirator that each worker has been assigned.
 - (iv) User seal checks shall be performed each time a respirator is donned.
 - (ii) Employers shall provide time to don and doff PPE during employees' working hours.
 - (iii) Employers shall provide frequent breaks to prevent respirator use fatigue and skin injuries (e.g., a 15-minute break every two hours).
- (5) Ensure that confidential psychological and behavioral support is available to address employee stress at no cost to the employee.
- (6) Employers shall provide sufficient access to common areas, break areas, and areas for eating to effectively reduce employee exposure to COVID-19 hazards.
- (a) Employers are responsible for ensuring the workplace controls in subsection (e)(4) are implemented in these spaces.
 - (b) Employers shall maximize the use of outdoor spaces for these activities where possible.
 - (c) If the nature of an employer's work or the work area does not allow employees to consume meals in the employee's workspace while observing physical distancing, an employer may designate, reconfigure, and alternate usage of spaces where employees congregate, including lunch and break rooms, locker rooms, time clocks, etc., with controlled access, provided the following conditions are met:
 - (i) At the entrance(s) of the designated common area or room the employer shall clearly post the policy in the language workers can understand, limiting the occupancy of the space, and requirements for physical distancing, hand washing/hand sanitizing, and cleaning and disinfecting of shared surfaces.
 - (ii) The employer shall limit occupancy of the designated common area or room so that occupants can maintain physical distancing from each other. The employer shall enforce the occupancy limit.
 - (iii) The employer shall schedule appropriately to enable employees to safely access the areas for the time allotted.

- (iv) The employer shall ensure ventilation requirements in subsection (e)(4)(b)(v)-(vii) are followed in these spaces.
 - (v) The employer shall provide for cleaning and disinfecting of the common area or room at regular intervals throughout the day, and between shifts of employees using the same common area or room or the employer shall ensure time for employees to clean and disinfect the immediate area in which they were located prior to leaving (i.e., where an employee or groups of employees have a designated lunch period and the common area or room can be cleaned in between occupancies).
 - (vi) Hand washing facilities and hand sanitizer are available to all employees.
- (7) Face coverings.
- (a) Employers shall ensure that all employees not otherwise required to be provided respiratory protection as determined by section (c) to wear face coverings.
 - (b) Employers shall ensure that all individuals who are not considered an employee (patients, patrons, customers, etc.) at the workplace or other premises subject to the employer's control wear a face covering.
 - (c) Face coverings are not personal protective equipment.
 - (d) Face shields are not a replacement for face coverings, although they may be worn together for additional protection.
- (8) Investigating and responding to patient and employee COVID-19 cases and suspected COVID-19 cases.
- (a) The employer shall develop and implement procedures the employer will use to identify patient and employee COVID-19 cases and suspected COVID-19 cases, evaluate each exposure incident to determine the cause, and to revise existing procedures to prevent future incidents.
 - (b) Employers shall develop policies and procedures to respond effectively and immediately to individuals at the workplace who are suspected or confirmed COVID-19 cases to prevent or reduce transmission of SARS-CoV-2 in the workplace and to investigate each patient and employee COVID-19 cases and suspected COVID-19 cases, including:
 - (i) Determining the day and time the COVID-19 case was last present and, to the extent possible, the date of the positive COVID-19 test(s) and/or diagnosis, and the date the COVID-19 case first had one or more COVID-19 symptoms, if any were experienced.
 - (ii) Determining who may have had an occupational exposure to a COVID-19 case.
 - (1) For patient COVID-19 cases, this requires an evaluation of all interactions with staff and evaluation of all locations at the workplace with potential exposure to the employee COVID-19 case, including transportation vehicles and common areas.

- (2) For employee COVID-19 cases, this requires an evaluation of activities of the COVID-19 case and all locations at the workplace with potential exposure to the employee COVID-19 case, including transportation vehicles and common areas. Note: See paragraph (g) for the medical removal requirements for employees with COVID-19 exposure.
- (c) Employers shall provide notice of exposure to a patient COVID-19 case or employee COVID-19 case immediately but no longer than 24 hours in a way that does not reveal personal identifying information of the COVID-19 case, to
 - (i) All employees who may have had exposure to the COVID-19 case and their authorized employee representatives, and
 - (ii) Contractors, vendors, licensed independent practitioners with privileges, businesses that provide or contract or temporary employees to the employer, as well as other persons who may have had occupational exposure to the COVID-19 case.
- (d) Employers shall investigate whether any workplace conditions could have contributed to the risk of COVID-19 hazards and what could be done to reduce COVID-19 exposures.
- (e) Personal identifying information of COVID-19 cases or suspected COVID-19 cases shall be kept confidential. All COVID-19 testing or related medical services provided by the employer under this section and sections (i) and (j) shall be provided in a manner that ensures the confidentiality of employees.
EXCEPTION to subsection: Unredacted information on COVID-19 cases shall be provided to the state or local health authority, CDC, OSHA, the National Institute for Occupational Safety and Health (NIOSH), or as otherwise required by law immediately upon request.
- (f) The employer shall ensure that all employee medical records required by this section and sections (f), (g) and (l) are kept confidential and are not disclosed or reported without the employee's express written consent to any person within or outside the workplace. See 1910.1020.
EXCEPTION 1 to subsection: Unredacted medical records shall be provided to the state or local health authority, CDC, OSHA, NIOSH, or as otherwise required by law immediately upon request.
EXCEPTION 2 to subsection: This provision does not apply to records that do not contain individually identifiable medical information or from which individually identifiable medical information has been removed.
- (9) Surge preparation and response.
 - (a) Employers shall create protocols and plans to respond to a surge of patients with Covid-19 or other infectious diseases (e.g., influenza), including, but not limited to:
 - (i) Expanding care supplies, such as bed capacity, ventilator capacity, PPE stockpile, and other medical equipment;
 - (ii) Ensure safe staffing as required under section (e)(4)(d)(iv);

- (iii) Preparing spaces such as separate waiting areas and surge tents;
and
 - (iv) Ensure the use of dedicated and separate areas of COVID-19 patient care as required under section (e)(4)(c)(i).
- (b) During a surge, employers shall implement their surge preparation protocols and plans. If employers are unable to effectively implement all necessary safety precautions to prevent transmission within the facility and to protect employees and patients from exposure, then the employer shall delay non-life threatening elective procedures.

Section (f): Medical screening and surveillance

- (1) The employer shall develop and implement a process for screening employees for and responding to employees with COVID-19 symptoms that reflects the attributes of the SARS-Cov-2 virus. The employer may ask employees to evaluate their own symptoms before reporting to work. If the employer conducts screening at the workplace, the employer shall ensure that personal protective equipment is used during screening by both screeners and employees.
- (2) To the extent permitted by law, including HIPAA, employers shall establish a system to receive reports of an employee COVID-19 case or suspected COVID-19 case by employees, subcontractors, contract employees, and temporary employees (excluding patients hospitalized on the basis of being known or suspected to be infected with SARS-CoV-2 virus) present at the place of employment within the previous 14 days from the date of positive test, and the employer shall notify:
 - a. Its own employees who may have been exposed, immediately but no longer than 24 hours of discovery of their possible exposure, while keeping confidential the identity of the known to be infected with SARS-CoV-2 virus person in accordance with the requirements of the Americans with Disabilities Act (ADA) and other applicable federal and Virginia laws and regulations; and
 - b. In the same manner as paragraph (f)(2)(a), other employers whose employees were present at the work site during the same time period;
 - c. In the same manner as paragraph (f)(2)(a) worker representatives; and
 - d. In the same manner as paragraph (f)(2)(a), the building/facility owner. The building/facility owner will require all employer tenants to notify them of the occurrence of a SARS-CoV-2-positive test for any employees or residents in the building. This will allow them to take the necessary steps to sanitize the common areas of the building. In addition, the building/facility owner will notify all employer tenants in the building that one or more cases have been discovered and the floor or work area where the case was located. The identity of the individual will be kept confidential in accordance with the requirements of the Americans

with Disabilities Act (ADA) and other applicable federal and Virginia laws and regulations.

- e. Medical follow-up services must be provided, free of charge, to all exposed employees.

(3) COVID-19 Testing.

- a. Employers shall offer access to COVID-19 testing to all employees who had potential COVID-19 occupational exposure or have reported COVID-19 symptoms.
- b. Employers shall offer access to COVID-19 testing at least once per week to all employees who are present at the workplace.
- c. Employers shall provide additional testing when deemed necessary by state or local health authorities or recommended by the CDC.
- d. COVID-19 testing shall be provided at no cost to employees and during employees' working hours.
- e. Employers shall provide employees offered testing with the information on benefits described in paragraph (g)(1)(c).

- (4) COVID-19 case log. The employer shall keep a record of and track all employee COVID-19 cases and fatalities with the employee's name, contact information, occupation, location where the employee worked, the date of the last day at the workplace, the date of a positive COVID-19 test, the dates the employee was not in the workplace due to COVID-19, and if applicable the date of death. Medical information shall be kept confidential in accordance with subsections (e)(7)(f). The information shall be made available to employees, authorized employee representatives, or as otherwise required by law, with personal identifying information removed.

Note: Subsection (f)(4) does not alter the right of employees or their representatives to request and obtain an employer's Log of Work-Related Injuries and Illnesses (Log 300), without redaction, or to request and obtain information as otherwise allowed by law.

Section (g): Medical removal and return to work criteria.

(1) Medical removal.

- (a) Employers shall ensure that employee COVID-19 cases, suspected cases and employees with a COVID-19 exposures are excluded from the workplace until the return to work requirements of subsection (g)(2) are met.
- (b) For employees excluded from work under subsection (g)(1) and otherwise able and available to work, employers shall continue and maintain an employee's earnings, seniority, and all other employee rights and benefits, including the employee's right to their former job status, as if the employee had not been removed from their job.

EXCEPTION 1: Subsection (g)(1) does not apply to any period of time during which the employee is unable to work for reasons other than protecting persons at the workplace from possible COVID-19 transmission.

- (c) Subsection (g)(1) does not limit any other applicable law, employer policy, or collective bargaining agreement that provides for greater protections.
 - (d) At the time of exclusion, the employer shall provide the employee the information on benefits described in subsections (g)(1)(b) and (f)(3).
- (2) Return to work criteria for employees.
- (a) COVID-19 cases shall not return to work until employee has received two negative test results, taken more than 24 hours apart, or the following conditions are met:
 - (i) At least 24 hours have passed since a fever of 100.4 or higher has resolved without the use of fever-reducing medications; and
 - (ii) COVID-19 respiratory symptoms have improved (e.g., cough, shortness of breath); and
 - (iii) At least 20 days have passed since the date their symptoms first appeared, their first positive COVID-19 test, or their known exposure.
 - (b) Suspected COVID-19 cases shall not return to work until they have received two negative results of COVID-19 tests at least 24 hours apart.
 - (c) Employees with COVID-19 exposures without wearing adequate respiratory protection as determined by subsection (4)(g) and according to 1910.134 and personal protective equipment according to 1910.132 shall not return to work until 14 days have passed since the employee was exposed to a COVID-19 case and the employee has remained asymptomatic during this time period.
 - (i) Employees should be advised that if any symptoms develop they should immediately report them to the employer and isolate, as per subsection (g)(2)(c).
 - (d) If an order to isolate or quarantine an employee is issued by a local, state or federal health official, the employee shall not return to work until the period of isolation or quarantine is completed or the order is lifted. If no period was specified, then the period shall be 10 days from the time the order to isolate was effective, or 14 days from the time the order to quarantine was effective.

Section (h): Training

- (1) The employer shall provide free, effective training and instruction to employees during working hours that includes the following:
 - (a) The requirements of this standard;
 - (b) The employer's COVID-19 Infection Control Plan, including the policies and procedures for reporting symptoms, cases and exposures, and to protect employees from COVID-19 hazards.
 - (c) Information regarding COVID-19-related benefits to which the employee may be entitled under applicable federal, state, or local laws. This includes any benefits available under workers' compensation law, the federal Families First

Coronavirus Response Act, local governmental requirements, the employer's own leave policies, and leave guaranteed by contract.

- (d) The characteristics and methods of transmission of the SARS-CoV-2 virus;
 - (i) The fact that COVID-19 is an infectious disease that can be spread through the air when an infectious person talks or vocalizes, sneezes, coughs, or exhales; that COVID-19 may be transmitted when a person touches a contaminated object and then touches their eyes, nose, or mouth, although that is less common; and that an infectious person may have no symptoms.
 - (ii) Awareness of the ability of pre-symptomatic and asymptomatic COVID-19 persons to transmit the SARS-CoV-2 virus;
- (e) The operations and activities in the workplace, including non-fixed and field settings, identified in the exposure determination that present risks of exposure to SARS-CoV-2 and COVID-19 and the procedures and measures for controlling them;
- (f) Safe and healthy work practices, including but not limited to:
 - (i) Physical distancing, disinfection procedures, disinfecting frequency, ventilation, non-contact methods of greeting, etc.
 - (ii) Methods of physical distancing of at least six feet and the importance of combining physical distancing with the wearing of face coverings.
 - (iii) The fact that particles containing the virus can travel more than six feet, especially indoors, so physical distancing must be combined with other controls, including face coverings and hand hygiene, to be effective.
 - (iv) The importance of frequent hand washing with soap and water for at least 20 seconds and using hand sanitizer when employees do not have immediate access to a sink or hand washing facility, and that hand sanitizer does not work if the hands are soiled.
 - (v) Proper use of face coverings and the fact that face coverings are not respiratory protective equipment.
- (g) COVID-19 symptoms, and the importance of not coming to work and of obtaining a COVID-19 test if the employee has COVID-19 symptoms.
- (h) Risk factors of severe COVID-19 illness with underlying health conditions;
- (i) PPE, including requirements under 29 CFR 1910.132 and 29 CFR 1910.134:
 - (i) When PPE is required;
 - (ii) What PPE is required;
 - (iii) How to properly don, doff, adjust, and wear PPE;
 - (iv) The limitations of PPE;
 - (v) The proper care, maintenance, useful life, and disposal of PPE; and
 - (vi) Heat-related illness prevention including the signs and symptoms of heat-related illness;

- (j) The anti-discrimination provisions of this standard in section k; and
 - (k) The employer's COVID-19 Infection Control Plan.
- (2) The person conducting the training shall be knowledgeable in the subject matter covered by the training program as it relates to the workplace. Training material appropriate in content and vocabulary to the educational level, literacy, and language of employees shall be used.
 - (3) The training must provide an opportunity for interactive questions and answers (within 24 hours if virtual) with a person who is knowledgeable in the subject matter as it relates to the workplace that the training addresses and who is also knowledgeable in the employer's COVID-19 control procedures.
 - (4) Employers shall verify compliance with subsection (h)(1) by preparing a written certification record. The written certification record shall contain the name or other unique identifier of the employee trained, the trained employee's physical or electronic signature, the date(s) of the training, and the name of the person who conducted the training, or for computer-based training, the name of the person or entity that prepared the training materials. If the employer relies on training conducted by another employer or completed prior to the effective date of this standard, the certification record shall indicate the date the employer determined the prior training was adequate rather than the date of actual training.
 - (5) The latest training certification shall be maintained.
 - (6) Additional Training. Circumstances where retraining is required include, but are not limited to, situations where:
 - (a) Changes in the workplace, job tasks, or SARS-CoV-2 virus or COVID-19 disease hazards render previous training obsolete;
 - (b) Changes are made to the employer's COVID-19 Exposure and Infection Control Plan; or
 - (c) Upon employee request.

Section (i): Outbreaks

- (1) Scope
 - (a) This section applies to a place of employment covered by the standard if it has been identified by a local or state health authority as the location of a COVID-19 outbreak or when there are two or more employee COVID-19 cases in an exposed workplace within a 14-day period.
 - (b) This section shall apply until there are no new COVID-19 cases detected in a workplace for a 14-day period.
- (2) COVID-19 testing.
 - (a) The employer shall offer COVID-19 testing to all employees with a known or suspected occupational exposure except for employees who were not present during the period of an outbreak identified by a local health authority or the

relevant 14-day period(s) under subsection (1), as applicable. COVID-19 testing shall be provided at no cost to employees and during employees' working hours.

- (b) COVID-19 testing shall consist of the following:
 - (i) Employees with a known or suspected occupational exposure shall be offered testing immediately upon being covered by this section.
 - (ii) Employees shall be offered testing again more than 24 hours after, but within three days of, testing performed as a result of subsection (i)(2)(b)(1).
 - (iii) After the first two COVID-19 tests required by (i)(2)(a), employers shall provide continuous COVID-19 testing at least twice per week for employees who remain at the workplace, or more frequently if recommended by the local health department, until this section no longer applies pursuant to subsection (i)(2)(b).
 - (iv) Negative COVID-19 test results of employees with COVID-19 exposure shall not impact the duration of any quarantine period required by, or orders issued by, the local or state health authority.
 - (v) Employers shall provide additional testing when deemed necessary by the state or local health authority.
- (3) Removal of employee COVID-19 cases and return to work according to paragraph (g)
- (4) Investigation of workplace COVID-19 illness. The employer shall immediately investigate and determine possible workplace related factors that contributed to the COVID-19 outbreak in accordance with paragraph (e)(3).
- (5) COVID-19 Investigation, review and hazard correction. In addition to the requirements of paragraph (e), the employer shall immediately perform a review of potentially relevant COVID-19 policies, procedures, and controls and implement changes as needed to prevent further spread of COVID-19. The investigation and review shall be documented and include:
 - (a) Investigation of new or unabated COVID-19 hazards including the employer's leave policies and practices and whether employees are discouraged from remaining home when sick; the employer's COVID-19 testing policies; insufficient outdoor air; insufficient air filtration; insufficient PPE; and lack of physical distancing.
 - (b) The review shall be updated every thirty days that the outbreak continues, in response to new information or to new or previously unrecognized COVID-19 hazards, or when otherwise necessary.
 - (c) The employer shall implement changes to reduce the transmission of COVID-19 based on the investigation and review required by subsections (i)(5)(A) and (i)(5)(B).
- (6) Notifications to OSHA and the local health authority.

- (a) The employer shall contact OSHA and the local health authority immediately but no longer than 24 hours after the employer knows, or with diligent inquiry would have known, of two or more employee COVID-19 cases for guidance on preventing the further spread of COVID-19 within the workplace.
- (b) The employer shall provide to the local health authority the total number of COVID-19 cases and for each employee COVID-19 case, the name, contact information, occupation, workplace location, business address, the hospitalization and/or fatality status, and North American Industry Classification System code of the workplace of the COVID-19 case, and any other information requested by the local health authority. The employer shall continue to give notice to the local health authority of any subsequent COVID-19 cases at the workplace.

Section (j). Major Outbreaks

(1) Scope

- (A) This section applies to a place of employment covered by the standard when there are 5% or more COVID-19 cases among employees present at the exposed workplace within a 30-day period.
- (B) This section shall apply until there are no new employee COVID-19 cases detected in a workplace for a 14-day period.

(2) COVID-19 testing according to section (i)(2).

(3) Removal of employee COVID-19 cases and return to work according to paragraph (g)

(4) Investigation of workplace COVID-19 illness. The employer shall immediately investigate and determine possible workplace related factors that contributed to the COVID-19 outbreak in accordance with paragraph (e)(3).

(5) COVID-19 Investigation, review and hazard correction. In addition to the requirements of paragraph (e), the employer shall immediately perform a review of potentially relevant COVID-19 policies, procedures, and controls and implement changes as needed to prevent further spread of COVID-19. The investigation and review shall be documented and include:

- (A) Investigation of new or unabated COVID-19 hazards including the employer's leave policies and practices and whether employees are discouraged from remaining home when sick; the employer's COVID-19 testing policies; insufficient outdoor air; insufficient air filtration; insufficient PPE; and lack of physical distancing.
- (B) The review shall be updated every fifteen days that the outbreak continues, in response to new information or to new or previously unrecognized COVID-19 hazards, or when otherwise necessary.
- (C) The employer shall implement changes to reduce the transmission of COVID-19 based on the investigation and review required by subsections (i)(5)(A) and (i)(5)(B).

(6) Notifications to OSHA and the local health authority.

- (A) The employer shall contact OSHA and the local health authority immediately but no longer than 24 hours after the employer knows, or with diligent inquiry would have known, of a major outbreak of employee COVID-19 cases for guidance on preventing the further spread of COVID-19 within the workplace.
- (B) The employer shall provide to the local health authority the total number of employee COVID-19 cases and for each COVID-19 case, the name, contact information, occupation, workplace location, business address, the hospitalization and/or fatality status, and North American Industry Classification System code of the workplace of the COVID-19 case, and any other information requested by the local health authority. The employer shall continue to give notice to the local health authority of any subsequent COVID-19 cases at the workplace.

Section (k). Discrimination against an employee for exercising rights under this standard is prohibited.

- (1) No person shall discharge or in any way discriminate against an employee because the employee has exercised rights under the safety and health provisions of this standard, and implementing regulations under [federal discrimination law] for themselves or others.
- (2) No person shall discharge or in any way discriminate against an employee who voluntarily provide and wears their own personal protective equipment, including but not limited to a respirator, face shield, or gloves, or face covering if such equipment is not provided by the employer, provided that the PPE does not create a greater hazard to the employee, or create a serious hazard for other employees.
- (3) No person shall discharge or in any way discriminate against an employee who raises a reasonable concern about infection control related to the SARS-CoV-2 virus and COVID-19 disease to the employer, the employer's agent, other employees, a government agency, or to the public such as through print, online, social, or any other media.
- (4) No person shall discharge, discipline or in any way discriminate against an employee who refuses an assigned task based upon a reasonable belief that it presents a real danger of serious injury or death due to exposure to SARS-CoV-2, as provided for under 29 CFR 1977.12.

Section (l). Recordkeeping and Reporting

- (1) For the purposes of 1904.39, an employer shall report to the U.S. Department of Labor Occupational Safety and Health Administration as follows:
 - (a) Each work-related death within eight (8) hours of when the employer learns of the death of an employee as a result of occupational exposure to SARS-CoV-2.
 - (b) Each work-related hospitalization within twenty-four (24) hours of when the employer learns of the in-patient hospitalization of one or more employees as a result of occupational exposure to SARS-CoV-2.

- (2) Employers covered by the rule shall ensure access by employees and their designated representative to SARS-CoV-2 virus and COVID-19 related exposure and medical records in accordance with 29 CFR 1910.1020, Access to Employee Exposure and Medical Records.

Section (m). Relationship to other Laws

- (1) Nothing in this standard shall: [or This standard is not intended to:]
- (a) curtail or limit authority of the Secretary under any other provision of the law, including the application of other safety and health requirements in health care facilities, services, and operations not covered by this Act;
 - (b)** preempt the application of any other statute, order or regulation of any State or local government related to the protection of the public and or employees from the SARS-COV-2 virus and COVID-19 disease, except to the extent that such provisions are inconsistent with this standard, and then only to the extent of the inconsistency. A provision of law, order or regulation of a State or local government is not inconsistent with this standard if such provision provides equal or greater protection to the public or workers than the protection provided under this standard.

Scientific Evidence on Aerosol Transmission of SARS-CoV-2

Scientific evidence regarding aerosol transmission of SARS-CoV-2 is overwhelming. We urge OSHA to leave behind the outdated “droplet vs airborne” framework and ensure that the Covid-19 ETS is based on the most up-to-date, science-based understanding of respiratory pathogen transmission (aerosol transmission).

This section outlines recent evidence underlining the significant and primary role aerosol transmission plays in the spread of SARS-CoV-2.

1. Infected individuals emit infectious aerosol particles.

- a. Infectious SARS-CoV-2 virus was readily isolated from upper respiratory tract samples of patients hospitalized with Covid-19, even in the absence of a cough. High viral loads were also found to be more than 1,000 times higher for SARS-CoV-2 compared to SARS-CoV-1.¹²
- b. Researchers collected exhaled breath condensate from 57 Covid-19 patients, four hospitalized non-Covid-19 patients, and 15 healthy individuals in Beijing. Exhaled breath samples had the highest positive rate; Covid-19 patients emitted millions of SARS-CoV-2 particles into the air per hour.¹³
- c. Researchers recovered viable SARS-CoV-2 virus in the air from hospital rooms with Covid-19 patients, collected 6.5 to 15.7 feet away from the patients.¹⁴
- d. SARS-CoV-2 was detected in respired aerosols <5 µm in diameter around six patients, collected beyond 6 feet, produced through normal breathing, vocalization, and coughing. This study also showed infectious, replicating virions in aerosol samples <1 µm in diameter.¹⁵
- e. Researchers detected SARS-CoV-2 in air samples taken greater than 6 feet from isolated Covid-19 patients and in air samples worn by sampling personnel, in the absence of a cough.¹⁶
- f. Researchers detected viral presence in exhaled breath, even without cough, for seasonal coronaviruses, influenza viruses, and rhinoviruses in both respiratory droplet (>5 µm) and aerosol (<5 µm) particles.¹⁷

¹² Wölfel, R., V.M. Corman, et al., “Virological assessment of hospitalized patients with COVID-2019,” *Nature*, April 1, 2020, <https://www.nature.com/articles/s41586-020-2196-x>.

¹³ Ma, J., X. Qi, et al., “COVID-19 patients in earlier stages exhaled millions of SARS-CoV-2 per hour,” *Clinical Infectious Diseases*, Aug 28, 2020, <https://pubmed.ncbi.nlm.nih.gov/32857833/>.

¹⁴ Lednicky, J.A., M. Lazuardo, et al., “Viable SARS-CoV-2 in the air of a hospital room with COVID-19 patients,” *International Journal of Infectious Diseases*, Sept 15, 2020, [https://www.ijidonline.com/article/S1201-9712\(20\)30739-6/fulltext](https://www.ijidonline.com/article/S1201-9712(20)30739-6/fulltext).

¹⁵ Santarpia, J.L., V.L. Herrera, et al., “The Infectious Nature of Patient-Generated SARS-CoV-2 Aerosol,” *medRxiv*, July 21, 2020, (preprint) <https://www.medrxiv.org/content/10.1101/2020.07.13.20041632v2>.

¹⁶ Santarpia, J.L., D.N. Rivera, et al., “Aerosol and surface contamination of SARS-CoV-2 observed in quarantine and isolation care,” *Scientific Reports*, July 29, 2020, <https://www.nature.com/articles/s41598-020-69286-3>.

¹⁷ Leung, N.H.L., D.K.W. Chu, et al., “Respiratory virus shedding in exhaled breath and efficacy of face masks,” *Nature Medicine*, April 3, 2020, <https://www.nature.com/articles/s41591-020-0843-2>.

- g. Researchers found that recovering Covid-19 patients still exhaled thousands of SARS-CoV-2 per minute. The virus was also detected in hospital air samples, and surface swabs.¹⁸
- 2. SARS-CoV-2 virus has been found in a range of aerosol particle sizes, including less than 5 microns and less than 1 micron.**
- a. Air sampling of two Covid-19 patients detected SARS-CoV-2 aerosol particles in $>4\ \mu\text{m}$ and $1 - 4\ \mu\text{m}$ in diameter.¹⁹
 - b. SARS-CoV-2 was detected in respired aerosols $<5\ \mu\text{m}$ in diameter around six patients, collected beyond 6 feet, produced through normal breathing, vocalization, and coughing. This study also showed infectious, replicating virions in aerosol samples $<1\ \mu\text{m}$ in diameter.²⁰
 - c. SARS-CoV-2 was recovered in air samples from a hospital setting, including in size-fractionated samples 2.5 microns or less, 2.5 to 10 microns, and greater than 10 microns.²¹
- 3. SARS-CoV-2 can survive and remain infectious when suspended in aerosol particles.**
- a. Researchers found that SARS-CoV-2 can remain infectious for up to 16 hours suspended in aerosols.²²
 - b. Researchers found that SARS-CoV-2 can survive in aerosols suspended in the air for at least 3 hours and on surfaces for several days.²³
- 4. When infected individuals breathe, cough, sneeze, or vocalize, they emit aerosol particles in a wide range of sizes. These particles can travel through the air to distances farther than six feet and can remain suspended in the air for long periods of time.**

¹⁸ Zhou, L., M. Yao, et al., “Breath-, air- and surface-borne SARS-CoV-2 in hospitals,” *Journal of Aerosol Science*, Feb 2021, Vol 152: 105693, <https://www.sciencedirect.com/science/article/abs/pii/S0021850220301786?via%3Dihub>.

¹⁹ Chia, P.Y., K.K. Coleman, et al., “Detection of air and surface contamination by SARS-CoV-2 in hospital rooms of infected patients,” *Nature Communications*, May 29, 2020, <https://www.nature.com/articles/s41467-020-16670-2>.

²⁰ Santarpia, J.L., et al. medRxiv, July 21, 2020.

²¹ Stern, Koutrakis, et al., “Characterization of hospital airborne SARS-CoV-2,” *Respiratory Research*, Feb 26, 2021, <https://respiratory-research.biomedcentral.com/articles/10.1186/s12931-021-01637-8>.

²² Fears, A.C., W.B. Klimstra, et al., “Persistence of Severe Acute Respiratory Syndrome Coronavirus 2 in Aerosol Suspensions,” *Emerging Infectious Diseases*, Sept 2020, Vol 26, No 9, https://wwwnc.cdc.gov/eid/article/26/9/20-1806_article.

²³ van Doremalen, N., D.H. Morris, et al., “Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1,” *New England Journal of Medicine*, April 16, 2020, <https://www.nejm.org/doi/full/10.1056/nejmc2004973>.

- a. Pathogen-carrying gas clouds emitted when people breath, cough, and sneeze can travel up to 23 – 27 feet.²⁴
 - b. Researchers found that a diner (index case) in South Korea infected two other people after five minutes of exposure from a distance of 4.8 meters (15 feet) and 6.5 meters (21 feet). Interviews, credit card records, cell phone location data, CCTV footage and PCR testing were collected.²⁵
 - c. Researchers found that normal conversations can create a turbulent, jet-like airflow that can transport exhaled breath over two meters (6.5 feet) in front of the speaker, potentially further, within 30 seconds.²⁶
 - d. Researchers found that the time-of-flight to reach 6.5 feet is only a few seconds resulting in a viral dose above the minimum required for Covid-19 infection, implying that physical distance alone in the absence of ventilation and respiratory protection is insufficient to provide safety for long exposure times.²⁷
- 5. Multiple outbreak investigations have found that aerosol transmission is the only explanation for the outbreak.**
- a. An epidemiological investigation determined that a correctional officer in Vermont contracted SARS-CoV-2 after multiple brief encounters with six asymptomatic incarcerated individuals. Each interaction lasted about one minute, totaling 17 minutes of exposure over an eight-hour shift. The officer wore a microfiber cloth mask, gown, goggles, and gloves, and maintained six feet from the infected inmates the entire time. The officer had no known contact with anyone else with Covid-19 and coronavirus cases were low in his home county and in the rest of the correctional facility at the time, leading researchers to conclude that his exposure most likely came from the brief encounters.²⁸
 - b. An outbreak investigation in an Israeli pediatric hospital identified six health care worker nosocomial infections from an asymptomatic patient that tested negative for Covid-19 upon admission. All six health care workers became infected despite wearing surgical masks at all times after providing routine patient care, which

²⁴ Bourouiba, L., “Turbulent Gas Clouds and Respiratory Pathogen Emissions: Potential Implications for Reducing Transmission of COVID-19,” JAMA, March 26, 2020, <https://jamanetwork.com/journals/jama/fullarticle/2763852>.

²⁵ Kwon, K.S., J.I. Park, et al., “Evidence of Long-Distance Droplet Transmission of SARS-CoV-2 by Direct Air Flow in a Restaurant in Korea,” Journal of Korean Medical Science, Nov 30, 2020, <https://jkms.org/DOIx.php?id=10.3346/jkms.2020.35.e415>.

²⁶ Abkarian, M., S. Mendez, et al., “Speech can produce jet-like transport relevant to asymptomatic spreading of virus,” Proceedings of the National Academy of Sciences, Sept 25, 2020, <https://www.pnas.org/content/117/41/25237/tab-article-info>.

²⁷ de Oliveira, P.M., L.C.C. Mesquita, et al., “Evolution of spray and aerosol from respiratory releases: theoretical estimates for insight on viral transmission,” Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, Jan 20, 2021, <https://royalsocietypublishing.org/doi/10.1098/rspa.2020.0584>.

²⁸ Pringle, J.C., J. Leikauskas, et al., “COVID-19 in a Correctional Facility Employee Following Multiple Brief Exposures to Persons with COVID-19 — Vermont, July–August 2020,” MMWR Early Release, Oct 30, 2020, <https://www.cdc.gov/mmwr/volumes/69/wr/mm6943e1.htm>.

lasted less than 10 minutes. Three of the six health care workers had no contact with the patient and maintained physical distance.²⁹

- i. Note that this study underlines the faultiness of CDC's focus on "droplet" transmission. CDC says droplet transmission occurs when large droplets are emitted by infected individuals and those droplets are inhaled by someone close to the infected individual.³⁰ CDC's droplet precautions include wearing a surgical mask.³¹ Surgical masks in combination with physical distancing did not stop transmission in this outbreak.
- c. Detailed investigation of the Skagit Valley Chorale outbreak found that SARS-CoV-2 transmission was dominated by inhalation of respiratory aerosols generated by one index case. After evaluating several influential factors such as ventilation rate, duration of event, and deposition onto surfaces, researchers determined that aerosol transmission was the only explanation for the outbreak.³²
- d. A SARS-CoV-2 outbreak investigation of a large meat processing complex in Germany found that a single index case led to 1,500 worker infections. SARS-CoV-2 virus was transmitted between workers more than 26 feet away from each other who had no other points of contact.³³
- e. A cluster investigation from Brigham and Women's Hospital found that 15 patients and 42 health care workers became infected with Covid-19 from a patient whose isolation was removed after testing negative for the virus. Whole-genome sequencing confirmed that some health care workers were infected despite wearing surgical masks and eye protection.³⁴
 - i. Note that this study underlines the faultiness of CDC's focus on "droplet" transmission. CDC says droplet transmission occurs when large droplets are emitted by infected individuals and those droplets are inhaled by

²⁹ Goldberg, L., Y. Levinsky, et al., "SARS-CoV-2 Infection Among Health Care Workers Despite the Use of Surgical Masks and Physical Distancing—the Role of Airborne Transmission," *Open Forum Infectious Diseases*, Jan 27, 2021, <https://academic.oup.com/ofid/advance-article/doi/10.1093/ofid/ofab036/6121257>.

³⁰ U.S. Centers for Disease Control and Prevention, "Science Brief: SARS-CoV-2 and Potential Airborne Transmission," updated Oct 5, 2020, <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/scientific-brief-sars-cov-2.html>.

³¹ U.S. Centers for Disease Control and Prevention, "Transmission-Based Precautions," page last reviewed Jan 7, 2016, <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>.

³² Miller, S.L., W.W. Nazaroff, et al., "Transmission of SARS-CoV-2 by inhalation of respiratory aerosol in the Skagit Valley Chorale superspreading event," *Indoor Air*, Sept 26, 2020, <https://onlinelibrary.wiley.com/doi/full/10.1111/ina.12751>.

³³ Günther, T., M. Czech-Sioli, et al., "SARS-CoV-2 outbreak investigation in a German meat processing plant," *EMBO Molecular Medicine*, Oct 27, 2020, <https://www.embopress.org/doi/full/10.15252/emmm.202013296>.

³⁴ Klompas, M., M.A. Baker, et al., "A SARS-CoV-2 Cluster in an Acute Care Hospital," *Annals of Internal Medicine*, Feb 9, 2021, <https://www.acpjournals.org/doi/full/10.7326/M20-7567>.

someone close to the infected individual.³⁵ CDC's droplet precautions include wearing a surgical mask.³⁶ Surgical masks in combination with physical distancing did not stop transmission in this outbreak.

- f. An epidemiological investigation in a department store in China identified 43 Covid-19 cases. After analyzing interviews and surveillance footage, researchers found that 12 out of 43 patients were infected at distances beyond reach of droplet, making aerosol transmission likely.³⁷
- g. Investigation into an outbreak in a church in Sidney. Case patient sang in the choir, had no close physical contact with other attendees, 12 of whom became infected. Secondary cases were 1-15 meters away from the case patient, and in a section below the case patient (who was in the choir loft). Case patient was facing away from this section, indicating aerosol transmission was at play.³⁸
- h. This study documents transmission from gym instructor to class participants in an indoor cycling class and kickboxing class in Hawaii. Ventilation was poor; this is a case of aerosol transmission. Only a few class participants wore masks (instructors did not), but they were infected even with mask wearing.³⁹
- i. Researchers detected SARS-CoV-2 in central ventilation systems of three Covid-19 wards in a Swedish hospital. Viral SARS-CoV-2 RNA was detected in ventilation exhaust filters located at least 50 meters (164 feet) from patient room vent openings within wards, indicating long-distance aerosol transmission.⁴⁰
- j. Mathematical modelling using case data from the Diamond Princess cruise ship outbreak found: "Our results show that airborne transmission by small aerosols containing SARS-CoV-2 was most likely the dominant mode of COVID-19 transmission aboard the ship, even with assumptions of a very high ventilation rate (9 to 12 air changes per hour) and no air recirculation, which are both

³⁵ U.S. Centers for Disease Control and Prevention, "Science Brief: SARS-CoV-2 and Potential Airborne Transmission," updated Oct 5, 2020, <https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/scientific-brief-sars-cov-2.html>.

³⁶ U.S. Centers for Disease Control and Prevention, "Transmission-Based Precautions," page last reviewed Jan 7, 2016, <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>.

³⁷ Jiang, G., C. Wang, et al., "Aerosol transmission, an indispensable route of COVID-19 spread: case study of a department-store cluster," *Frontiers of Environmental Science & Engineering*, Dec 25, 2020, <https://pubmed.ncbi.nlm.nih.gov/33391845/>.

³⁸ Katelaris, Wells, et al., "Epidemiologic Evidence for Airborne Transmission of SARS-CoV-2 during Church Singing, Australia, 2020," *Emerging Infectious Diseases*, April 5, 2021, https://wwwnc.cdc.gov/eid/article/27/6/21-0465_article.

³⁹ Groves, Usagawa, "Community Transmission of SARS-CoV-2 at Three Fitness Facilities — Hawaii, June–July 2020," *MMWR*, March 5, 2021, <https://www.cdc.gov/mmwr/volumes/70/wr/mm7009e1.htm>.

⁴⁰ Nissen, K., J. Krambrich, et al., "Long-distance airborne dispersal of SARS-CoV-2 in COVID-19 wards," *Scientific Reports*, Nov 11, 2020, <https://www.nature.com/articles/s41598-020-76442-2>.

conservative assumptions that favor against long-range airborne transmission. The long range and short-range transmission routes had similar contributions to the total number of infected cases. However, aerosol transmission across both short- and long-range distances accounted for >50 percent of disease transmission overall, which is contrary to the prevailing positions on how COVID-19 is spread held by organizations like WHO and CDC, but is consistent with emerging evidence for airborne transmission.”⁴¹

Wide Scientific Consensus Regarding the Need to Recognize Aerosol Transmission of SARS-CoV-2

- 1. Experts, professional associations, and other organizations have urged the CDC and the rest of the U.S. government to fully recognize aerosol transmission of SARS-CoV-2.**
 - a. A group of experts sent a letter on Feb 15, 2021 urging the White House, CDC, and National Institutes of Health (NIH) to take immediate action to address SARS-CoV-2 inhalation exposure.⁴²
 - b. National Nurses United and 44 allied unions and organizations sent a petition urging the CDC to update its Covid-19 guidance to fully reflect the latest scientific evidence regarding SARS-CoV-2 transmission through aerosols that infected people emit when they breathe, speak, cough, sneeze, or sing.⁴³ Over 12,000 individuals signed this petition.
 - c. The American Industrial Hygiene Association published a joint consensus statement⁴⁴ to call on the CDC and the Occupational Safety and Health Administration (OSHA) to issue guidance preventing occupational exposures due to aerosol transmission of SARS-CoV-2. Below are co-sponsors of the statement.
 - i. American Conference of Governmental Industrial Hygienists

⁴¹ Azimi, P., Z. Keshavarz, et al., “Mechanistic transmission modeling of COVID-19 on the Diamond Princess cruise ship demonstrates the importance of aerosol transmission,” PNAS, Feb 23, 2021, <https://www.pnas.org/content/118/8/e2015482118>.

⁴² Bright, R., L.M. Brosseau, L.R. Goldman, C. Gounder, J. Jimenez, Y. Kawaoka, L. Marr, D. Michaels, D.K. Milton, M. Osterholm, K. Prather, R.T. Schooley, and P. Seminario to J. Zients, R.P. Walensky, and A.S. Fauci, “Re: Immediate Action is Needed to Address SARS-CoV-2 Inhalation Exposure,” Feb 15, 2021, https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/uploads/PressReleases/Immediate-Action-to-Address-Inhalation-Exposure-to-SARS-CoV-2_2142021.pdf.

⁴³ National Nurses United, “Nurses, Unions, Allies Urge CDC to Acknowledge Covid-19 Aerosol Transmission to Help Bring Virus Under Control,” Feb 23, 2021, <https://www.nationalnursesunited.org/press/nurses-unions-allies-urge-cdc-to-acknowledge-covid-19-aerosol-transmission>.

⁴⁴ Brosseau, L.M., A.H. Mitchell, and J. Rosen, “Joint Consensus Statement on Addressing the Aerosol Transmission of SARS CoV-2 and Recommendations for Preventing Occupational Exposures,” American Industrial Hygiene Association, Feb 1, 2021, <https://aiha-assets.sfo2.digitaloceanspaces.com/AIHA/resources/Fact-Sheets/Joint-Consensus-Statement-on-Addressing-the-Aerosol-Transmission-of-SARS-CoV-2-Fact-Sheet.pdf>.

- ii. American Association of Aerosol Research
 - iii. Association of Occupational Health Professionals in Healthcare
 - iv. American Thoracic Society
 - v. Association of Schools & Programs of Public Health
 - vi. National Association of Occupational Health Professionals
 - vii. Occupational Health Clinics for Ontario Workers, Inc.
 - viii. Organization for Safety Asepsis and Prevention
 - ix. Society of Critical Care Medicine
- d. The American Society of Heating, Refrigerating and Air-Conditioning Engineering (ASHRAE) released new guidance on January 6, 2021 to address control of airborne infectious aerosol exposure.⁴⁵
- e. Representatives Robert C. “Bobby” Scott, Rosa L. DeLauro, Frank Pallone, Jr., James E. Clyburn, and Alma S. Adams sent a letter on March 1, 2021 to the White House, CDC, and the Department of Labor commending the Biden Administration’s strong, science-based action and expressing “serious questions about the adequacy of the current Centers for Disease Control and Prevention (CDC) Guidance regarding protections from aerosol transmission of the virus.”⁴⁶
- f. The House Education and Labor Committee, Workforce Protections Subcommittee held a hearing on March 11, 2021 titled: “Clearing the Air: Science-Based Strategies to Protect Workers from COVID-19 Infections.” At this hearing, experts testified to the importance and necessity of recognizing aerosol transmission of the coronavirus to ensuring an effective pandemic response, including the importance of the CDC updating its guidance and OSHA issuing strong, enforceable standards.⁴⁷
- g. Chairman Bobby Scott released a statement on March 10, 2021 urging the CDC “to follow the evidence and research and direct its energies into improving protections for health care workers, not into eroding them.”⁴⁸ Chairman Scott also emphasized the “there is no evidence that surgical masks are adequate to prevent exposure of frontline health workers to the virus that causes Covid-19.”

⁴⁵ ASHRAE Epidemic Task Force, “Core Recommendations for Reducing Airborne Infectious Aerosol Exposure,” Jan 6, 2021, <https://www.ashrae.org/file%20library/technical%20resources/covid-19/core-recommendations-for-reducing-airborne-infectious-aerosol-exposure.pdf>.

⁴⁶ Scott, R.C., R.L. DeLauro, F. Pallone, Jr., J.E. Clyburn, and A.S. Adams to J. Zients, R.P. Walensky, and A. Stewart, March 1, 2021.

⁴⁷ House Education & Labor Committee, Workforce Protections Subcommittee, “Clearing the Air: Science-Based Strategies to Protect Workers from COVID-19 Infections,” March 11, 2021, <https://edlabor.house.gov/hearings/clearing-the-air-science-based-strategies-to-protect-workers-from-covid-19-infections>.

⁴⁸ Scott, B., “Scott Statement on CDC Decision to Weakening Coronavirus Protections for Frontline Health Care Workers,” House Education & Labor Committee, March 10, 2020, <https://edlabor.house.gov/media/press-releases/scott-statement-on-cdc-decision-to-weakening-coronavirus-protections-for-frontline-health-care-workers>.

- h. The American Public Health Association (APHA) sent a letter to the U.S. Subcommittee on Workforce Protections on March 10, 2021 urging the CDC to update its guidelines that are consistent with the scientific evidence of inhalation risk. “The best scientific evidence indicates that inhalation is the primary route of transmission of SARS-CoV-2. OSHA standards and CDC guidelines must be updated to fully recognize the significant risk of exposure to the virus through inhalation.”
 - i. Senator Alex Padilla sent a letter to the U.S. Department of Labor, the White House, and the CDC on March 27, 2021, urging the CDC “to take additional steps regarding protections from aerosol transmission of the virus.”
 - j. Similar communications have been sent to governments around the world. Dr. Lisa Brosseau has collected selected letters and posted them here:
<https://drive.google.com/drive/u/0/folders/16gIPk7UXTu6onIXggM96D5iqI07U0wMY>
- 2. Literature reviews and editorials regarding the importance of recognizing aerosol transmission of SARS-CoV-2 have been published by experts.**
- a. Greenhalgh, T., Jimenez, J.L., et al., “Ten scientific reasons in support of airborne transmission of SARS-CoV-2,” *The Lancet*, April 15, 2021, [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(21\)00869-2/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00869-2/fulltext).
 - b. Samet, J.M., K. Prather, et al., “Airborne Transmission of SARS-CoV-2: What We Know,” *Clinical Infectious Diseases*, Jan 18, 2021, <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab039/6103221>
 - c. Tang, J.W., W.P. Bahnfleth, et al., “Dismantling myths on the airborne transmission of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2),” *J Hosp Infection*, Jan 12, 2021, [https://www.journalofhospitalinfection.com/article/S0195-6701\(21\)00007-4/fulltext](https://www.journalofhospitalinfection.com/article/S0195-6701(21)00007-4/fulltext)
 - d. Jones, R., “Droplets, aerosols and COVID-19: updating the disease transmission paradigm,” OUPblog, Jan 11, 2021, <https://blog.oup.com/2021/01/droplets-aerosols-and-covid-19-updating-the-disease-transmission-paradigm/>.
 - e. Jarvis, M.C., “Aerosol Transmission of SARS-CoV-2: Physical Principles and Implications,” *Front Public Health*, Nov 23, 2020, <https://www.frontiersin.org/articles/10.3389/fpubh.2020.590041/full>
 - f. Prather, K., L.C. Marr, et al., “Airborne transmission of SARS-CoV-2,” *Science*, Oct 16, 2020, <https://science.sciencemag.org/content/370/6514/303.2.full>
 - g. Tang, S., Y. Mao, et al., “Aerosol transmission of SARS-CoV-2? Evidence, prevention and control,” *Environ Int*, Aug 7, 2020 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7413047/>

- h. Milton, D. “A Rosetta Stone for Understanding Infectious Drops and Aerosols,” J Pediatric Infectious Diseases Society, July 24, 2020
<https://academic.oup.com/jpids/article/9/4/413/5875939>
- i. Morawska, L. and D.K. Milton, “It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19),” Clinical Infectious Diseases, July 6, 2020, <https://academic.oup.com/cid/article/71/9/2311/5867798?login=true>
- j. Zhang, R., Y. Li, et al., “Identifying airborne transmission as the dominant route for the spread of COVID-19,” Proceedings of the National Academy of Sciences, June 30, 2020, <https://www.pnas.org/content/117/26/14857>
- k. Dancer, S.J., J.W. Tang, et al., “Putting a balance on the aerosolization debate around SARS-CoV-2,” J Hospital Infection,” May 13, 2020,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7219351/>
- l. Marr, L. and J. Jimenez, “Bibliography on Transmission of COVID-19,” (unpublished), July 3, 2020,
https://docs.google.com/document/d/13s6QyHyF6Pqfr2_R_4ilmzmjYHRmrWE0EzwHvxvyRL4/edit?usp=sharing.

Scientific Evidence on Asymptomatic and Presymptomatic Transmission of SARS-CoV-2 and Timeframes for Transmission

Infected individuals emit infectious aerosol particles and can transmit the virus even when they are asymptomatic or pre-symptomatic, in addition to when they are symptomatic. Some individuals may shed virus for long periods of time. We urge OSHA to ensure a Covid-19 ETS fully recognizes the role that asymptomatic and presymptomatic transmission plays in the rapid spread of SARS-COV-2 and to take a precautionary approach to implementing and removing precautions for confirmed and potential Covid patients.

This section outlines recent evidence underlining the significant role asymptomatic and presymptomatic transmission plays in the spread of SARS-CoV-2.

1. Asymptomatic and presymptomatic infected individuals can shed infectious virus and transmit SARS-CoV-2.

- a. Xiao, T., Wang, Y., et al., “Early Viral Clearance and Antibody Kinetics of COVID-19 Among Asymptomatic Carriers ,” *Frontiers in Medicine*, March 15, 2021, <https://www.frontiersin.org/articles/10.3389/fmed.2021.595773/full>.
 - i. Study looked at asymptomatic, presymptomatic, and symptomatic patients from Shenzhen, China. There were no significant differences in viral load between asymptomatic, presymptomatic, or symptomatic patients.
- b. Rothe C., Schunk M., Sothmann P., et al., “Transmission of 2019-nCoV Infection from an Asymptomatic Contact in Germany.” *NEJM*, Jan 30, 2021, https://www.nejm.org/doi/full/10.1056/NEJMc2001468?query=featured_home.
- c. Lu S, Lin J, Zhang Z, et al. “Case Report of Familial Cluster With Three Asymptomatic COVID-19 Patients,” *Journal of Medical Virology*, March 19, 2020, <https://onlinelibrary.wiley.com/doi/10.1002/jmv.25776>.
- d. Zou, L., Ruan, F., et al. “SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients” *NEJM*, March 19, 2020, <https://www.nejm.org/doi/full/10.1056/NEJMc2001737?query=TOC>.
- e. Du, Z., Xu, X., et al. “Serial Interval of COVID-19 among Publicly Reported Confirmed Cases,” *Emerging Infectious Diseases*, March 19, 2020, https://wwwnc.cdc.gov/eid/article/26/6/20-0357_article.
- f. Li C, Ji F, Wang L, et al. 2020. “Asymptomatic and Human-to-Human Transmission of SARS-CoV-2 in a 2-Family Cluster, Xuzhou, China,” *Emerging Infectious Diseases*, July 2020, https://wwwnc.cdc.gov/eid/article/26/7/20-0718_article.
- g. Guoqing Q., Yang, N., et al., “COVID-19 Transmission within a family cluster by presymptomatic infectors in China,” *Clinical Infectious Diseases*, March 23, 2020, <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciaa316/5810900?searchresult=1>.

- h. Wei, W.E., Li, Z., et al., “Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020,” *MMWR*, April 10, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6914e1.htm?s_cid=mm6914e1_e&deliveryName=USCDC_921-DM24694.
- i. Kimball A, Hatfield KM, et al., “Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility — King County, Washington, March 2020.” *MMWR*, March 27, 2020, https://www.cdc.gov/mmwr/volumes/69/wr/mm6913e1.htm?s_cid=mm6913e1_w
- j. Baggett TP, Keyes H, et al., “Prevalence of SARS-CoV-2 Infection in Residents of a Large Homeless Shelter in Boston,” *JAMA*, April 27, 2020, <https://jamanetwork.com/journals/jama/fullarticle/2765378>.
- k. Kim GU, Kim MJ, Ra SH, et al. “Clinical characteristics of asymptomatic and symptomatic patients with mild COVID-19,” *Clinical Microbiology and Infection*, May 1, 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7252018/>.
- l. Yin, G., & JIN, H., “Comparison of transmissibility of coronavirus between symptomatic and asymptomatic patients: Reanalysis of the Ningbo COVID-19 data (Preprint),” *JMIR Public Health and Surveillance*, April 18, 2020, <https://publichealth.jmir.org/2020/2/e19464/>.
- m. Zhang, W., Cheng, W., et al., “Secondary Transmission of Coronavirus Disease from Presymptomatic Persons, China,” *Emerging Infectious Diseases*, August 2020, https://wwwnc.cdc.gov/eid/article/26/8/20-1142_article.

2. Approximately half of transmission events are due to asymptomatic and presymptomatic transmission.

- a. Ng, Cheng, et al., “Comparison of Estimated Effectiveness of Case-Based and Population-Based Interventions on COVID-19 Containment in Taiwan,” *JAMA Internal Medicine*, April 6, 2021, <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2778395>.
 - i. Study looked at 158 Covid cases in Taiwan. Estimated 55% of transmission occurred during presymptomatic stage.
- b. He X, Eric HY, Wu P, et al., “Temporal dynamics in viral shedding and transmissibility of COVID-19,” *Nature Medicine*, April 15, 2020, <https://www.nature.com/articles/s41591-020-0869-5>.
 - i. “We report temporal patterns of viral shedding in 94 patients with laboratory-confirmed COVID-19 and modeled COVID-19 infectiousness profiles from a separate sample of 77 infector–infectee transmission pairs. We observed the highest viral load in throat swabs at the time of symptom onset, and inferred that infectiousness peaked on or before symptom onset. We estimated that 44% (95% confidence interval, 25–69%) of secondary cases were infected during the index cases’ presymptomatic stage, in

settings with substantial household clustering, active case finding and quarantine outside the home.”

- c. Meher, K.P., “Quantitative COVID-19 infectiousness estimate correlating with viral shedding and culturability suggests 68% pre-symptomatic transmissions,” medRxiv, May 12, 2020, <https://www.medrxiv.org/content/10.1101/2020.05.07.20094789v1>.
- d. Wu, Liu, et al., “Assessing asymptomatic, pre-symptomatic and symptomatic transmission risk of SARS-CoV-2,” Clinical Infectious Diseases, March 27, 2021, <https://academic.oup.com/cid/advance-article/doi/10.1093/cid/ciab271/6193430>.

3. Post-exposure isolation period should reflect the available scientific evidence and be based on the precautionary principle.

- a. After exposure to SARS-CoV-2/Covid-19, an employee should be placed on paid precautionary leave for fourteen (14) days. The incubation period—the time after an exposure that it can take for an infection to develop—for SARS-CoV-2 is fourteen (14) days, based on the available data, including:
 - i. Contact tracing data from Hubei province, China showed a median incubation period of 5.4 days and the 2.5th and 97.5th percentiles at one and 15 days, respectively.⁴⁹
 - ii. Analysis of epidemiological data from 164 Covid-19 cases in Singapore found a median incubation period of five days with a range of one to 12 days.⁵⁰
 - iii. Literature review and meta-analysis looked at 42 studies that looked at incubation periods. They found that the mean incubation period was max 8 days, median 12 days. 95th percentile was in the range of 10.3 to 16 days. Highest 99th percentile was 20.4 days. “This work provides additional evidence of incubation period for COVID-19 and showed that it is prudent not to dismiss the possibility of incubation periods up to 14 days at this stage of the epidemic.”⁵¹
- b. While the median and mean incubation periods are approximately four to five days, these are not appropriate measures to use to determine the post-exposure isolation period. The median represents simply the middle number in a set and the mean represents the average. If the mean incubation period is used to establish post-exposure isolation time periods, a large proportion of cases will become

⁴⁹ Yan, Lin, Jingyi Dai, et al., “Estimation of incubation period and serial interval of COVID-19: analysis of 178 cases and 131 transmission chains in Hubei province, China,” *Epidem & Infect*, June 19, 2020.

⁵⁰ Tan, W.Y.T., L.Y. Wong, et al., “Does incubation period of COVID-19 vary with age? A study of epidemiologically linked cases in Singapore,” *Epidem & Infect*, Sept 2, 2020.

⁵¹ Dhouib, Maatoug, et al., “The incubation period during the pandemic of COVID-19: a systematic review and meta-analysis,” *Systematic Reviews*, April 8, 2021, <https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-021-01648-y>.

infectious after that timeframe. For public health and occupational health protection, it is necessary to use the range of incubation periods to ensure the timeframe effectively includes the majority of individuals. That timeframe is 14 days post-exposure.

4. Removal of precautions after a positive Covid test should be based on testing and done in a precautionary manner.

- a. Early in the pandemic it became clear that some individuals continue to shed SARS-CoV-2 virus for long periods of time, even after symptoms (if any) have resolved. While many people assert that after a certain timeframe this is “dead virus,” there has not been clear evidence to support this claim. The available scientific evidence indicates that some individuals remain infectious for potentially long periods:
 - i. Literature review reported that, based on 77 studies, viral RNA was detected up to 92 days after symptom onset and viable (infectious) SARS-CoV-2 virus was isolated from six to 20 days after symptom onset.⁵²
 - ii. Case report of a patient with mild Covid-19 symptoms showed replication-competent SARS-CoV-2 virus recovered from sputum samples through 18 days after symptom onset.⁵³
 - iii. Study recovered viable (infectious) SARS-CoV-2 virus from Covid-19 patients’ nasopharyngeal (NP) and saliva samples up to days 11 to 15 of the clinical course. Virus recovered from patients’ urine and stool samples were used to intranasally inoculate ferrets. Viable (infectious) virus was recovered from ferrets’ nasal washes. Patients shed infectious virus longer than 10 days.⁵⁴
 - iv. Study reported on patient data from Mayo Clinic Florida and led authors to “propose following more cautious guidelines,” specifically “recommend[ing] discontinuing self-isolation no sooner than 21 days after onset of symptoms.”⁵⁵
 - v. A case study found infectious SARS-CoV-2 virus up to 70 days after first positive test in an immunocompromised patient’s nasopharyngeal swabs, significantly longer than the CDC’s guidance. This patient remained asymptomatic throughout.⁵⁶

⁵² Fontana, Lauren M., Angela Holly Villamagna, et al., “Understanding viral shedding of severe acute respiratory coronavirus virus 2 (SARS-CoV-2): Review of current literature,” *Infect Control & Hosp Epidemiol*, Oct 20, 2020.

⁵³ Liu, Wang-Da, Sui-Yuan Chang, et al., “Prolonged virus shedding even after seroconversion in a patient with COVID-19,” *J Infect*. 2020 Aug; 81(2): 318-356.

⁵⁴ Jeong, Hye Won, Se-Mi Kim, et al., “Viable SARS-CoV-2 in various specimens from COVID-19 patients,” *Clinical Microbio & Infect*, Nov 2020; 26(11): 1520-24.

⁵⁵ Woodruff, Amelita, Katherine L. Walsh et al., “COVID-19 infection: Strategies on when to discontinue isolation, a retrospective study,” *AJIC*, Sept 2020; 48(9): 1032-36.

⁵⁶ Avanzato, Victoria A., M. Jeremiah Matson, et al., “Case Study: Prolonged Infectious SARS-CoV-2 Shedding from an Asymptomatic Immunocompromised Individual with Cancer,” *Cell*, Nov 4, 2020.

- vi. Viable virus was recovered from nasopharyngeal swabs from three patients in Italy with hematologic malignancies at 238, 37, and 40 days after first PCR positive test.⁵⁷
- b. The CDC distinguishes between people without severe disease and people with severe disease in their timeframes for return-to-work following a positive Covid-19 test.⁵⁸ We do not think this is well supported by scientific evidence. We propose a more protective return-to-work timeframe:
 - i. Any employee with a positive Covid-19 test should remain on paid precautionary leave until:
 - 1. At least 24 hours have passed since a fever of 100.4°F or higher has resolved without the use of fever-reducing medications, Covid-19 respiratory symptoms have improved, and at least 20 days have passed since symptom onset or their first positive Covid-19 test, if no symptoms, OR
 - 2. The employee has received two negative tests, taken at least 24 hours apart.
 - ii. These return-to-work protocols would be more protective for patients and health care workers and better reflect the available scientific evidence regarding infectiousness.

For more information contact Jane Thomason, jthomason@nationalnursesunited.org.

⁵⁷ Taramasso, Sepulcri, et al., “Duration of isolation and precautions in immunocompromised patients with COVID-19,” *J Hospital Infection*, Feb 22, 2021, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7898969/>.

⁵⁸ U.S. Centers for Disease Control and Prevention, “Criteria for Return to Work for Healthcare Personnel with SARS-CoV-2 Infection (Interim Guidance),” Aug 10, 2020, <https://www.cdc.gov/coronavirus/2019-ncov/hcp/return-to-work.html>.