ATTACHMENT 1

National Nurses United letter to the CDC (February 19, 2020)

National Nurses United
The National Voice for Direct-Care RNs

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February 19, 2020

Mr. Mark Pallansch, Director
Division of Viral Diseases
National Center for Immunization and Respiratory Diseases (NCIRD)
1600 Clifton Road NE
Atlanta, GA 30329

Subject: **CDC's Interim Infection Prevention and Control Recommendations for Patients with Confirmed 2019 Novel Coronavirus (2019-nCoV) or Persons Under Investigation for 2019-nCoV in Healthcare Settings**

Dear Director Pallansch:

National Nurses United (NNU), representing more than 150,000 members, is the largest union of registered nurses in the United States. As such, we are concerned that our members are afforded their right to a safe and healthful workplace and are fully protected by their employers from hazardous exposures that may occur in the course of providing patient care.

While the novel coronavirus, provisionally 2019-nCoV, now SARS-CoV-2, is a newly identified virus, this is not a novel situation. Unfortunately, the world has seen several similar infectious disease events in recent decades—Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS), H1N1 influenza, Ebola, Zika, and others—and this is unlikely to be the last. Each successive event has underlined the importance of a strong public health infrastructure and the need for our healthcare facilities to be prepared.

NNU's members provide patient care in a variety of settings, including clinics and hospitals, which are most likely to see patients who may have a 2019-nCoV infection, now called COVID-19. Healthcare facilities must maintain protective infection control and prevention plans to prevent occupational exposure to staff and to stop the spread of this novel coronavirus. The Centers for Disease Control and Prevention (CDC) often serves as a resource to healthcare facilities on infectious diseases and we appreciate the CDC's publication of interim guidance for infection control and prevention in healthcare facilities on the novel coronavirus.

While the CDC addresses many important elements in their guidance, there are significant issues that will put nurses and other healthcare workers, their patients, and ultimately our communities at increased risk of exposure. We are writing to urge the CDC to strengthen their Interim Infection Prevention and Control Recommendations for Patients with Confirmed 2019 Novel Coronavirus (2019-nCoV) or Persons Under Investigation for 2019-nCoV in Healthcare Settings immediately in the following ways:

1. **CDC should remove all references to the outdated "six foot rule."**

Section 1 of the interim guidance addresses measures to screen and isolate patients to prevent the spread of novel coronavirus in healthcare facilities. Prompt recognition and isolation of possible COVID-19 cases is a significant element in preventing further spread. CDC's guidance rightly recommends that source control procedures be implemented and that patients with symptoms of respiratory infection should not be allowed to wait with other patients.

Instead, CDC states that patients who have symptoms of any respiratory infection should be placed in a "separate, well-ventilated space that allows waiting patients to be separated by 6 or more feet...." Recent advancements have allowed much more thorough characterization of respiratory droplet size, mass, settling and evaporation time, and other factors that influence particulate behavior. This research indicates that with respiratory symptoms such as sneezing or coughing a wide range of aerosols are created, some of which travel through and remain in the air for some time.[1]

During flu season there are many patients presenting to healthcare facilities with respiratory symptoms. CDC's guidance would have these patients waiting in the same space as patients with possible COVID-19 cases, effectively exposing them to this novel virus and encouraging its continued spread. The "six foot rule" is archaic and the CDC should strike all reference to it from their infection control and prevention guidance. The CDC should instead recommend that patients identified as possible COVID-19 cases be placed in an isolation room immediately, preferably one with negative pressure.

2. **CDC should rectify their definition of "hand hygiene," which currently violates OSHA's Bloodborne Pathogens Standard.**

Section 2 addresses isolation precautions, including personal protective equipment (PPE), and other work practice controls. Under "Hand Hygiene," the CDC explicitly recommends that healthcare workers should perform "hand hygiene using ABHS [alcohol-based hand sanitizer] before and after all patient contact, contact with potentially infectious materials, and before putting on and upon removal of PPE, including gloves." The CDC adds handwashing with soap and water as an afterthought, "Hand hygiene in healthcare settings also can be performed by washing with soap and water for at least 20 seconds...." Especially when dealing with a novel virus about which little is known, this is an irresponsible recommendation. Hand sanitizer only removes some—not all—of certain kinds of bacteria and viruses whereas handwashing with soap and water is significantly more protective.

Further, the CDC's promotion of hand sanitizer does not meet the level of protection required by the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogens Standard (29 CFR 1910.1030), which mandates that hand hygiene be performed with soap and water after removal of gloves or other PPE and after contact with blood or other potentially infectious materials. Hand sanitizer is allowed as a backup for situations when handwashing with soap and

[1] For example, see: Lee, J., D. Yoo, et al. (2019). Quantity, Size Distribution, and Characteristics of Cough-generated Aerosol Produced by Patients with an Upper Respiratory Tract Infection. *Aerosol and Air Quality Research*, 19: 840-853.
Xiao, S., Y. Li, et al. A study of the probable transmission routes of MERS-CoV during the first hospital outbreak in the Republic of Korea. *Indoor Air*, 28(1): 51-63.

water is not feasible, but OSHA still requires that hands be washed with soap and water as soon as feasible (29 CFR 1910.1030(d)(2)(iv)).

In addition, CDC should note the recent letter the U.S. Food and Drug Administration (FDA) sent to GOJO Industries Inc., maker of PURELL hand sanitizer products. FDA took issue with several claims made in marketing materials about the efficacy of PURELL against bacteria, viruses, and preventing the spread of infectious diseases:[2]

> FDA is currently not aware of any adequate and well-controlled studies demonstrating that killing or decreasing the number of bacteria or viruses on the skin by a certain magnitude produces a corresponding clinical reduction in infection or disease caused by such bacteria or virus.

The CDC's promotion of hand sanitizer use for COVID-19 is irresponsible and should be remedied immediately.

3. CDC should strengthen their PPE recommendations for healthcare workers providing care to known or suspected COVID-19 cases.

Section 2 and the Appendix address the PPE to be worn by healthcare workers providing care to patients with confirmed or suspected COVID-19. It is important that the CDC has recognized the need for respiratory and eye protection, among other elements, to prevent healthcare worker exposure to this novel virus. However, there are several issues with CDC's recommendations on PPE.

First, the CDC guidance does not address the compatibility issues posed by wearing goggles with an N95 filtering facepiece respirator. Goggles can disrupt the seal of the facepiece respirator, undermining the protection that must be provided. OSHA's Technical Manual strongly recommends that "full-facepiece respirators be worn where either corrective glasses or eye protection is required…."[3] OSHA also notes that the full-facepiece respirator may be more comfortable and less cumbersome than the combination of a half-facepiece respirator and goggles. In hospitals and other healthcare settings, powered air-purifying respirators (PAPRs) and other full facepiece respirators are better options in these situations when both eye and respiratory protection are needed. CDC should remedy their guidance to recommend PAPRs or other full-facepiece respirators when both respiratory and eye protection are needed.

Second, the CDC's recommendation for simple isolation gowns may be inadequate. Since the current outbreak began, our knowledge of SARS-2/COVID-19 has evolved rapidly; but there is still much we do not know including how long this novel coronavirus may persist on surfaces. A recent review of the literature on the persistence of coronaviruses on inanimate surfaces found that several human coronaviruses can persist on inanimate surfaces for up to nine days.[4] The CDC's recommended PPE ensemble leaves healthcare workers' necks, heads, lower legs, and shoes

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[2] U.S. Food and Drug Administration, Division of Pharmaceutical Quality Operations III (January 17, 2020). *Warning Letter: Case # 599132*. Retrieved from https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/warning-letters/gojo-industries-inc-599132-01172020.

[3] U.S. Occupational Safety and Health Administration. *OSHA Technical Manual, Section VIII: Chapter 2, Respiratory Protection*. Retrieved from https://www.osha.gov/dts/osta/otm/otm_viii/otm_viii_2.html.

[4] Kampf, G., D. Todt, et al. Persistence of coronaviruses on inanimate surfaces and its inactivation with biocidal agents. *Journal of Hospital Infection*, In press.

uncovered. This may be insufficient to protect healthcare workers from exposure and may not effectively prevent the spread of novel coronavirus.

4. **CDC should improve recommendations on staffing to protect nurses, other healthcare workers, and patients.**

Section 2 addresses considerations for patient placement. While the CDC outlines several important recommendations, including limiting the personnel and visitors who enter an isolation room, they neglect an important consideration that nurses assigned to care known or suspected COVID-19 cases should not have other patient assignments. As noted above, this is a novel virus about which little is known, including the potential role in transmission of contaminated objects or surfaces. Ensuring that the nurse assigned to a known or suspected COVID-19 case has a one-to-one assignment prevents possible exposure to other patients via contaminated objects or surfaces. Additionally, the one-to-one assignment recognizes the significant time required to safely don and doff PPE, thus providing a higher level of protection for the nurse as well.

We request that CDC act promptly to clarify and update their guidance to reflect the concerns outlined above. If you have questions regarding these matters or would like to arrange a meeting, please contact Jane Thomason at 510-433-2771 or jthomason@nationalnursesunited.org.

Sincerely,

Bonnie Castillo

Bonnie Castillo, RN
Executive Director

cc: Mr. Robert Redfield, MD, Director, Centers for Disease Control and Prevention

Members of the U.S. Senate Committee on Health, Education, Labor, and Pensions

Members of the U.S. Senate Homeland Security and Governmental Affairs Committee

Members of the U.S. House Committee on Education and Labor

Members of the U.S. House Committee on Oversight and Government Reform

Mr. Richard Trumka, President, AFL-CIO

ATTACHMENT 2

National Nurses United Letter to White House, Congress on COVID-19 preparations and response (March 2, 2020)

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March 2nd, 2020

Vice-President Mike Pence
The White House, Office of the Vice-President
1600 Pennsylvania Ave NW
Washington, DC 20500

Ambassador Deborah Birx
The White House, Coronavirus Response Coordinator
1600 Pennsylvania Ave NW
Washington DC 20500

Members of the United States Senate
Washington, D.C. 20510

Members of the House of Representatives
Washington, D.C. 20515

Dear Mr. Vice President, Ambassador Birx, and Members of Congress,

As the nation braces to confront the novel coronavirus (COVID-19) that is quickly spreading across the world, National Nurses United, the largest union for registered nurses in the United States, has been closely monitoring the situation in our hospitals. As of the writing of this letter, 89,527 cases have been identified in 67 countries, and 3,056 people have died of the virus. In the United States, there are now 62 confirmed cases, including multiple cases of possible community transmission.

This week, NNU nurse members working at UC Davis Medical Center in California have been responding to a confirmed coronavirus case due to possible community transmission. As of this writing, 36 registered nurses and 88 other health care workers from that hospital have been quarantined due to possible exposure to the virus. This level of exposure from one patient at one hospital clearly demonstrates that the time to put the strongest protections in place is now. The failure to do so will severely inhibit our nation's ability to respond to this outbreak. Our union is working closely with our nurse members across the country to help keep workers and patients safe.

Over the past few weeks, we've been surveying our members and nurses across the country about preparedness in their hospitals, including access to personal protective equipment (PPE). As of February 28th, we had surveyed more than 6,000 nurses from 48 states, the District of Columbia, and the Virgin Islands. The findings of this survey indicate that the majority of US healthcare facilities are *completely unprepared* to safely contain COVID-19:

- Only 29% of respondents report that their facilities have a plan to isolate patients with possible coronavirus infection.

- Only 27% report having access to powered air-purifying respirators (PAPRs), the higher level of protection nurses need, in their unit, and only 63% of respondents report having access to N95 respirators in their unit.
- Only 30% report that their employer has sufficient PPE stock on hand to protect staff if there is a rapid surge in patients with COVID-19 infection.

As you can see, the survey shows that as of February 28th, a majority of facilities were clearly not prepared to safely respond to increasing COVID-19 cases. Nurses across the country report that basic communication from their employers about possible/confirmed cases and preparedness plans is missing. National Nurses United has also been submitting information requests to all the hospitals where we represent health care workers, to help ensure that they do have plans in place to protect workers.

It is critical that the federal government take quick and meaningful steps to urgently protect the public from this outbreak. National Nurses United urges the Administration and Congress to adopt the following policy recommendations in light of this outbreak:

1. **All registered nurses and other health care workers must receive the highest level of protection in their workplaces, as determined by the precautionary principle.** Nurses and other healthcare workers want to provide care that patients with COVID-19 need, but they need protections from their employers to be able to do so safely.

   The full protection of healthcare workers is a fundamental and necessary part of limiting the spread of viruses--this has been proven time and again with SARS, MERS, H1N1, Ebola, and others. It is critical that our nursing workforce is kept safe not only to provide critical care for patients with potential COVID-19 infection, but also to continue caring for other patients. Healthcare employers should have in place not only the proper screening protocols, isolation procedures, and PPE to protect healthcare workers caring for possible or confirmed COVID-19 cases, but also must begin preparing to safely respond to a possible surge in patients with COVID-19.

   Specifically, the federal government should mandate that healthcare employers do the following:

   - Communicate clearly with nurses and other staff regarding COVID-19 preparation, protocols, and any confirmed or suspected cases in the facility. When employers do not communicate clearly with staff it opens the door to misinformation and confusion which creates additional risk of transmission.

   - Implement screening protocols to promptly identify and isolate patients with respiratory symptoms. During flu season, healthcare employers should already have a separate waiting area for any patients or visitors with respiratory symptoms. This will be especially important in response to COVID-19. Given several recent reports of community transmission (without travel or exposure history originally used as screening criteria), screening

protocols must be updated to consider any patient with respiratory symptoms as a possible COVID-19 case.

- Ensure prompt isolation of patients with possible COVID-19 infection. These patients should be placed in airborne infection isolation rooms until COVID-19 or other infectious disease has been ruled out. These airborne infection isolation rooms must be maintained so that they provide protection to staff and patients.

- Provide the highest level of PPE to nurses and other health care workers who are providing care to patients with possible COVID-19 infections. Based on the precautionary principle, the highest level of PPE includes a powered air-purifying respirator (PAPR), coveralls that are impervious to viral penetration (meeting ASTM F1671/ISO 16604 standards), and gloves. Healthcare employers should have in-person, hands-on training and education for all nurses and other healthcare workers regarding PPE and safe donning and doffing practices.

- Make staffing assignments to ensure that nurses and other healthcare workers caring for patients with possible or confirmed COVID-19 infections are able to do so safely. When patients are on isolation, additional time is often needed to safely don and doff PPE. Wearing PPE can be extremely physically taxing; nurses who need to wear PPE ensembles for long periods of time should be given breaks and relief when needed. Additional staff may be necessary to assist nurses and other healthcare workers in donning and doffing PPE safely. Ensuring that nurses providing care to patients with possible or confirmed COVID-19 infections are, at minimum, on 1:1 assignments can help prevent unintentional spread of the virus via contaminated objects or surfaces.

- Implement effective procedures to identify any possible occupational exposure and to follow up immediately with affected staff. If a nurse or other healthcare worker is placed on precautionary leave, that leave must last for a minimum of fourteen days and the employer must maintain all pay, seniority, and benefits for the entire length of the leave.

- Maintain sufficient PPE stock and supply to protect nurses and other healthcare workers. Healthcare employers should have sufficient PPE stock on hand to protect healthcare workers during surge events. In the context of worldwide and regional PPE shortages, rationing or reuse of PPE should be implemented only after all other avenues have been exhausted, and nurses' professional judgment on when it is safe to reuse or conserve respirators must be heeded.

- Begin preparation immediately for a potential surge of patients with respiratory symptoms, which should include at least preparing separate

waiting areas such as surge tents, preparing plans to deal with significant numbers of patients such as overflow areas, ensuring staff are aware of surge plans before implementation, establishing plans to respond if significant numbers of healthcare workers are exposed or sick and unable to work.

2. **The CDC must improve screening criteria and testing capacity to ensure prompt recognition of and response to COVID-19 cases.** With several reports of community transmission, it is of the utmost importance that public health agencies and healthcare facilities adapt their screening criteria to enable a prompt and effective response to all possible COVID-19 infections. While the CDC updated their screening criteria on Feb 27 to reflect some considerations important to community transmission, the CDC's criteria are still limited to only test patients with serious respiratory illness requiring hospitalization and patients with symptoms plus known travel history or close contact with a confirmed COVID-19 case. These screening criteria are inadequate; COVID-19 should be considered for all patients with respiratory symptoms.

3. **The Occupational Safety and Health Administration must promulgate an Emergency Temporary Standard to protect healthcare workers from emerging infectious diseases like COVID-19 as soon as possible.** Such a standard would require healthcare employers to protect employees from exposure to COVID-19. After issuing the emergency temporary standard to immediately protect workers from exposure to COVID-19, OSHA must move forward to promulgate a final standard on infectious diseases.

4. **Congress and the Administration must ensure that any vaccine or treatment for COVID-19 that is developed with U.S. taxpayer dollars is provided to the American public when needed for free**. The only way to ensure that a vaccine or treatment for this novel virus is fully accessible and available, is for it to be provided to patients without any cost-sharing. Pharmaceutical companies must not be granted exclusive monopoly rights for the sale of any such technology that has been funded through grants from the U.S. government. The Administration and Congress must enforce guidelines to ensure that pharmaceutical companies do not monopolize and set high prices for any new vaccine or treatment for this outbreak.

5. **Congress must act immediately to pass an emergency spending package to fund the emergency response to the COVID-19 outbreak.** This emergency appropriation for epidemic control must be quickly dispersed to state and local actors.

   We believe that the budget request from the Administration for $1.5 billion in new spending is inadequate, as is their request to move another $1.25 billion away from existing health programs. It is critical that Congress appropriate new spending without diverting money from existing health programs that need to continue to operate at full capacity in order to protect public health in the long term. The level of funding provided by Congress for epidemic control must adequately meet the needs

of federal, state, and local agencies and health care providers in order to control the emerging epidemic. For reference, in the 2014 Ebola response, Congress appropriated a total of $5.4 billion in emergency funds for both the domestic and global response. In 2009, Congress appropriated a total of $7.7 billion in emergency funding for the response to the H1N1 influenza pandemic.

The emergency spending package must adequately fund a variety of agencies, local and state actors, and areas of work, in order to control this epidemic and prevent illness and deaths of our patients. This emergency congressional appropriation must include:

- Funding a robust public health response through the CDC, the Office of the Assistant Secretary for Preparedness and Response within HHS, and state and local health departments who lead surveillance, testing, and communication in their communities.

- Dedicated funds to provide the needed PPE and training to ensure that all health care workers, first responders, and others at risk of exposure are protected.

- Adequate funding for hospitals and other health care facilities to properly identify and isolate patients with potential COVID-19 infection, and to prepare for a surge of patients.

- Coverage of all treatment, care and services for people with potential COVID-19 infection who are uninsured or underinsured, including for insured patients who are denied coverage. This should include funding for widespread communication to the public that all testing, treatment, and other health care services related to COVID-19 will be paid for regardless of their insurance status. This is necessary to ensure that all patients will seek medical attention should they exhibit symptoms.

- Provision of temporary paid sick leave for all employees in all sectors, so that working people are not compelled to work if they are exhibiting symptoms associated with COVID-19.

- Increased funding to the National Institutes of Health for the research, development, testing, and approval of diagnostic tests, treatments, and vaccines.

- Increased funding to bilateral and multilateral global health programs, to boost the capacity of low and middle-income countries to control the global spread of the virus. This should include assistance to the World Health Organization, the CDC's Center for Global Health, USAID, and programs at the State Department and DoD that support global health security.

In addition to the recommendations listed above that are necessary for an immediate and effective response, it is also important to recognize the systemic issues that have led to the current situation. At the moment, we have a fragmented and broken public health infrastructure which is woefully unprepared for COVID-19. All federal, state and local public health departments and agencies that must coordinate quick public health responses have been consistently underfunded and are therefore unable to take the necessary steps to prepare in advance for emerging infectious disease threats. The for-profit motive in our health delivery system has led to hospital closures in rural and underserved communities, system-wide short-staffing of health care workers and inadequate supplies of medicines, medical equipment (including ventilators), and PPE in health care facilities. As a result, our hospitals and health care facilities are unable to adequately respond quickly to potential COVID-19 infections.

The only way that our country can build the public health infrastructure we need to adequately respond to emerging infectious diseases and pandemics is to implement a Medicare for All system, in which everyone living in this country is guaranteed the health care they need. Through a single payer system, we would strengthen our existing health care infrastructure, build and staff new health care facilities in rural and underserved communities, and drastically simplify our system which would greatly improve our ability to quickly respond to emerging public health threats.

On behalf of the 155,000 registered nurses that we represent, we urge you to advocate for the policy and funding levels listed above. If you have any questions, concerns, or would like more information on how our union is responding to this outbreak, please contact our Lead Legislative Advocate, Amirah Sequeira, at 240-447-0034, or at ASequeira@nationalnursesunited.org.

Sincerely,

Deborah Burger, RN
Co-President

Zenei Cortez, RN
Co-President

Jean Ross, RN
Co-President

cc: Secretary Alex Azar, Department of Health and Human Services
Dr. Robert Redfield, Director, Centers for Disease Control and Prevention
Dr. Anthony Fauci, Director, National Institute of Allergy and Infectious Diseases

ATTACHMENT 3

National Nurses United Petition to the Occupational Safety and Health Administration for an Emergency Temporary Standard in Response to COVID-19 (March 4, 2020)

National Nurses United
The National Voice for Direct-Care RNs

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March 4, 2020

The Honorable Eugene Scalia
Secretary of Labor
United States Department of Labor
200 Constitution Avenue, NW
Washington, D.C. 20210

The Honorable Loren Sweatt
Principal Deputy Assistant Secretary of Labor for Occupational Safety and Health
Occupational Safety and Health Administration
United States Department of Labor
200 Constitution Avenue, NW
Washington, D.C. 20210

Re: National Nurses United Petitions OSHA for an Emergency Temporary Standard on Emerging Infectious Diseases in Response to COVID-19

Dear Secretary Scalia and Principal Deputy Assistant Secretary Sweatt:

National Nurses United (NNU) is the largest union for direct care registered nurses (RNs) in the United States. As such, we are concerned that our members are afforded their right to a safe and healthful workplace and are thoroughly protected by their employers from hazardous exposures that may occur in the course of doing their jobs. On behalf of our members and all nurses and other healthcare workers in the United States, we urge you to take immediate action to ensure nurses and all healthcare workers are protected during the COVID-19 outbreak by granting this petition for the promulgation of an Emergency Temporary Standard on Emerging Infectious Diseases.

COVID-19 is quickly becoming a global pandemic, spreading to 74 countries in a matter of weeks.[1] According to the World Health Organization, a total of 91,783 cases have been identified in 74 countries, and 3,123 people have died of the virus as of March 3rd.[2] As of the same date, the total number of confirmed and presumptive positive cases in the United States is 60,[3] which is likely an underestimation given the U.S. Centers for Disease Control

[1] World Health Organization, (March 3, 2020), "Novel Coronavirus (COVID-19) Situation Dashboard," online at https://experience.arcgis.com/experience/685d0ace521648f8a5beeeee1b9125cd.
[2] World Health Organization, (March 3, 2020).
[3] U.S. Centers for Disease Control and Prevention, (March 3, 2020), "Coronavirus Disease 2019 (COVID-19) in the U.S." online at https://www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html.

and Prevention's (U.S. CDC) limited testing capacity, recent reports of community transmission, and rapidly evolving situation.[4,5]

In every emerging infectious disease event the world has seen, nurses and other health care workers are on the frontlines caring for the most vulnerable, high-risk patients. Nurses nationwide stand ready and willing to provide the lifesaving care patients with COVID-19 infections need, but nurses and other healthcare workers must have the highest level of protection to be able to do their jobs safely. The health and safety of nurses and other healthcare workers is of paramount importance to an effective response to emerging infectious disease events. Fundamentally, nurses and other healthcare workers have the same right as other workers to a workplace free from hazards that threaten their health and safety, including infectious diseases.

OSHA should take immediate action and fulfill its obligation to protect the health and safety of workers by granting this petition and passing an emergency temporary standard to protect nurses and other healthcare workers from emerging infectious diseases like COVID-19.

I. OSHA is obligated to engage in responsible rulemaking to protect worker health and safety and must promulgate an Emergency Temporary Standard on Emerging Infectious Diseases.

Through the Occupational Safety and Health (OSH) Act of 1970, Congress mandated the prioritization of the safety and health of workers and the prevention of occupational injury and illness and created an obligation by employers to provide a workplace free from recognized hazards.[6] Pursuant to this Congressional mandate, OSHA is obligated to promulgate and enforce an emergency temporary standard where two elements are determined:[7]

> (A) that employees are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful or from new hazards; and
> (B) that such emergency standard is necessary to protect employees from such danger.

COVID-19, like other emerging infectious diseases, constitutes precisely such a grave danger to nurses and other health care workers. This is a novel virus about which little is known. Healthcare employers are ill prepared to respond safely to prevent employee exposure to COVID-19. Where OSHA determines employees in other industries are at risk of COVID-19 exposure and a standard is necessary to protect those employees, OSHA should take appropriate action. Given the central role nurses and other healthcare workers face in response to emerging infectious diseases and the attendant high risk of exposure, NNU urges OSHA to take immediate action to protect nurses and other healthcare workers from COVID-19.

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[4] Chen, Caroline et al. (Feb 28, 2020), "Key Missteps at the CDC Have Set Back Its Ability to Detect the Potential Spread of Coronavirus." *ProPublica*, published online at https://www.propublica.org/article/cdc-coronavirus-covid-19-test.

[5] Schnirring, Lisa, (Feb 29, 2020), "Three states report new community spread of COVID-19." *Center for Infectious Disease Research and Policy*, published online at http://www.cidrap.umn.edu/news-perspective/2020/02/three-states-report-new-community-spread-covid-19.

[6] 29 U.S.C. § 651 (1970)

[7] 29 U.S.C. § 655(6)(c) (1970)

II. Emerging infectious diseases like COVID-19 expose nurses and other healthcare workers to grave danger and are new hazards.

A. COVID-19, Like Other Emerging Infectious Diseases, is a New Hazard.

Emerging infectious diseases are those "whose incidence in humans has increased in the past 2 decades or threatens to increase in the near future…which respect no national boundaries."[8] These infectious diseases can include:

- New infections resulting from changes or evolution of existing organisms
- Known infections spreading to new geographic areas or populations
- Previously unrecognized infections appearing in areas undergoing ecologic transformation
- Old infections reemerging as a result of antimicrobial resistance in known agents or breakdowns in public health measures.

COVID-19 is a newly emerged and identified coronavirus, similar to SARS. Researchers have proposed that the virus evolved to jump from animals to humans, but this remains unconfirmed.[9] Even as our knowledge of this virus is growing rapidly, there is still much unknown. As the National Institute for Occupational Safety and Health (NIOSH) recognizes,[10] in these situations the very fact that little is known about the infectious disease amplifies the danger posed to healthcare workers when their employers wait for information or evidence before taking protective action.

Unfortunately, the world has seen several emerging infectious disease events in recent decades—severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS), H1N1 influenza, Ebola, Zika, and others. Nurses and healthcare workers have been at significant risk of exposure to each of these emerging infectious diseases.[11,12,13,14] Emerging infectious disease events have increased in the current and previous centuries, and experts expect that trend to continue and worsen due to the climate crisis, globalization, dense urbanization, lack of public

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[8] U.S. Centers for Disease Control and Prevention, (last reviewed May 30, 2014), "EID Journal Background and Goals: What are 'emerging' infectious diseases?" online at https://wwwnc.cdc.gov/eid/page/background-goals.

[9] Cyranoski, David (Feb 26, 2020), "Mystery deepens over animal source of coronavirus." *Nature*, published online at https://www.nature.com/articles/d41586-020-00548-w.

[10] U.S. National Institute for Occupational Safety and Health, (Last Reviewed March 28, 2018) "Emerging Infectious Diseases." Online at https://www.cdc.gov/niosh/topics/emerginfectdiseases/default.html.

[11] Chan-Yeung, M., (2004), "Severe acute respiratory syndrome (SARS) and healthcare workers." *Int J Occup Environ Health*, 10(4): 421-7.

[12] Elkholy, A.A. et al. (May 2, 2019), "MERS-CoV infection among healthcare workers and risk factors for death: Retrospective analysis of all laboratory-confirmed cases reported to WHO from 2012 to 2 June 2018." *J Infect Public Health*, published online at https://www.sciencedirect.com/science/article/pii/S1876034119301443?via%3Dihub.

[13] Lietz, Janna et al., (2016), "The Occupational Risk of Influenza A (H1N1) Infection among Healthcare Personnel during the 2009 Pandemic: A Systematic Review and Meta-Analysis of Observational Studies." *PLoS One*, 11(8): e0162061.

[14] Suwantarat, Nuntra and Anucha Apisarnthanarak, (Aug 2015), "Risks to healthcare workers with emerging diseases: lessons from MERS-CoV, Ebola, SARS, and avian flu." *Current Opinion in Infectious Diseases*, 28(4): 349-61.

health infrastructure and funding, lack of protections within healthcare facilities, and other factors.[15,16,17]

In emerging infectious disease events, it is of the utmost importance that healthcare employers provide the fullest protections for nurses and other healthcare workers, especially when the hazard is a novel infectious disease. OSHA should pass an emergency temporary standard to require healthcare employers to provide protections during an emerging infectious disease event like COVID-19. The current urgency of the situation with COVID-19 should motivate OSHA to take immediate action.

B. COVID-19 can cause life-threatening infections, exposing nurses and other healthcare workers to grave danger.

Several published reports have established a basic picture of clinical symptoms and outcomes for those infected with COVID-19. These symptoms can include fever, cough, muscle soreness, weakness, diarrhea, headache, and other symptoms. While some symptoms appear to be common, there is also diversity in how COVID-19 manifests (Table 1).

Table 1: Symptoms of COVID-19 Reported in the Scientific Literature

Symptom	Huang et al. (Feb 15-21, 2020), report on 41 admitted hospital patients with laboratory-confirmed COVID-19 infection in Wuhan, Hubei Province, China[18]	Wang et al. (Feb 20, 2020), report on 105 patients with COVID-19 infections in North Shanghai, China [19]	Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies[20]
Fever	98%	82.9%	89%
Cough	85%	62.9%	63%
Fatigue or weakness	44%	17.1%	51%
Headache	8%	Muscle soreness 6.7%	8%
Diarrhea	3%	8.6%	7%

[15] Petersen, E. et al. (2018), "Emerging infections—an increasingly important topic: review by the Emerging Infections Task Force." *Clinical Microbiology and Infection*, 24(4): 369-75.
[16] Nii-Trebi, Nicholas Israel, (2017), "Emerging and Neglected Infectious Diseases: Insights, Advances, and Challenges." *BioMed Research International*, published online at https://www.hindawi.com/journals/bmri/2017/5245021/.
[17] Brooks, Daniel R. and Walter A. Boeger, (2019), "Climate change and emerging infectious diseases: Evolutionary complexity in action." *Current Opinion in Systems Biology*, 13: 75-81.
[18] Huang et al. (Feb 15-21 2020), "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China." The Lancet, 395(10223): 497-506
[19] Wang, Changhui, et al. (Feb 20, 2020), "The Epidemiologic and Clinical Features of Suspected and Confirmed Cases of Imported 2019 Novel Coronavirus Pneumonia in North Shanghai, China." Preprints with The Lancet, published online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3541125.
[20] Liang, Bo et al. (Feb 28, 2020), "Clinical Characteristics of 457 Cases with Coronavirus Disease 2019." Preprints with The Lancet, published online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3543581.

Several additional reports underline the potential seriousness of a COVID-19 infection, including damage to lung tissue that has become characteristic to COVID-19. A recent study describes this damage:

> "COVID-19 pneumonia manifests with chest CT imaging abnormalities, even in asymptomatic patients, with rapid evolution from focal unilateral to diffuse bilateral ground-glass opacities that progressed or co-existed with consolidations within 1-3 weeks."[21]

The Chinese Centers for Disease Control and Prevention (Chinese CDC) reported recently that approximately 20% of COVID-19 cases are classified as severe or critical.[22] COVID-19 infections may result in life-threatening conditions including acute respiratory distress syndrome, acute kidney injury, cardiac injury, and liver dysfunction (Table 2) and may require hospitalization, intensive care, intubation, or other significant life-saving interventions. In some cases, COVID-19 may lead to death; the Chinese CDC reported that 2.3% of confirmed COVID-19 cases died.[23] There is currently no cure, only supportive treatment, and no vaccine.

Table 2: Clinical Outcomes of COVID-19 Reported in the Scientific Literature

Clinical progression/outcome	Yang et al. (Feb 24, 2020), report on 52 critically ill patients with COVID-19 who were admitted to an intensive care unit (ICU) in Wuhan, China[24]	Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies[25]
Acute respiratory distress syndrome	67%	12%
Acute kidney injury	29%	2%
Cardiac injury	23%	3%
Liver dysfunction	29%	-
Death	61.5% at 28 days	8%

There are three possible transmission pathways that infectious diseases, especially those that cause respiratory symptoms like COVID-19, can follow: contact (direct/indirect), droplet, and aerosol transmission. There is currently no available evidence regarding the transmission pathway(s) for SARS-CoV-2/COVID-19. SARS-CoV-2/COVID-19 is similar to SARS-CoV and, to a lesser degree, MERS-CoV. There is sufficient evidence to indicate that direct and

[21] Shi, Heshui et al. (Feb 24, 2020), "Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study." The Lancet Infectious Diseases, published online, https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30086-4/fulltext.
[22] Wu, Zunyou and Jennifer M. McGoogan (Feb 24, 2020), "Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention." *JAMA*, published online at https://jamanetwork.com/journals/jama/fullarticle/2762130.
[23] Wu, Zunyou and Jennifer M. McGoogan (Feb 24, 2020).
[24] Yang, Xiaobo et al. (Feb 24, 2020), "Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study." The Lancet Respiratory Medicine, published online, https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30079-5/fulltext.
[25] Liang, Bo et al. (Feb 28, 2020).

indirect contact, droplet, and aerosol transmission are important to the transmission of both SARS-CoV and MERS-CoV.[26]

C. Healthcare workers around the world have been infected with COVID-19 and some have died.

Several reports have emerged from China and other countries with widespread COVID-19 transmission of healthcare workers who have become infected after providing care to patients with possible/confirmed COVID-19 infections.

The Chinese CDC reported recently that 1,716 healthcare personnel have been infected with COVID-19 and that 14.8% of those cases have been classified as severe or critical. Reportedly, at least five healthcare workers in China have died from COVID-19. However, media reports have suggested that the true number of healthcare workers infected in China may be more than 3,000.[27]

Japan has reported infections among healthcare personnel and workers assisting with the quarantine aboard the Diamond Princess cruise ship.[28,29] Reports have been made of several healthcare workers infections in South Korea.[30]

The preparedness of healthcare facilities is essential to prevent exposure of nurses and other healthcare workers to COVID-19 as well as further spread of the virus in the United States. Healthcare employers have not fully protected nurses and other healthcare workers from exposure in the United States. The recent COVID-19 case confirmed at the University of California, Davis Medical Center—the first case identified indicating community transmission in the United States—highlights the potential for widespread exposure of U.S. nurses and other health care workers. Because the employer was not prepared for one COVID-19 patient, 25 registered nurses and at least 80 other health care workers have been placed on precautionary leave.[31] This level of exposure from one patient at one hospital clearly demonstrates that the time to put the strongest protections in place is now.

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[26] National Nurses United, (Feb 16, 2020), "Selection of Protective PPE for Nurses and Other Health Care Workers Caring for Patients with COVID-19," published online at https://www.nationalnursesunited.org/sites/default/files/nnu/files/pdf/flyers/0220_NNU_HealthSafety_COVID-19_PPE_Report.pdf.

[27] Danmeng, Ma and Denise Jia, (Feb 18, 2020), "Coronavirus Among Medics More Widespread Than Reported, Research Shows." *Caixin*, published online at https://www.caixinglobal.com/2020-02-18/coronavirus-among-medics-more-widespread-than-reported-research-shows-101516740.html.

[28] Al-Arshani, Sarah, (Feb 11, 2020), "A Japanese health worker caught coronavirus on the quarantined cruise ship where 174 passengers have tested positive." *Business Insider*, published online at https://www.businessinsider.com/japan-health-worker-got-coronavirus-on-quarantine-ship-diamond-princess-2020-2.

[29] Japanese Ministry of Health, Labour and Welfare, (Feb 13, 2020), "About outbreak of patient associated with new coronavirus (the 29th case)," (machine translated), online at https://www.mhlw.go.jp/stf/newpage_09505.html.

[30] Yonhap News Agency, (Feb 26, 2020), "(2nd LD) More mass infections may come from hospitals, medical facilities," online at https://en.yna.co.kr/view/AEN20200226006952320?section=national/national.

[31] National Nurses United, (Feb 28, 2020), "Nation's hospitals unprepared for COVID-19." Online at https://www.nationalnursesunited.org/press/nations-hospitals-unprepared-covid-19.

Please note that the most up-to-date numbers have been used in the petition.

II. An Emergency Temporary Standard is immediately necessary to protect nurses and other healthcare workers from the hazards posed by emerging infectious diseases like COVID-19.

A. Voluntary measures by industry are insufficient to protect nurses and other healthcare workers from COVID-19.

Healthcare employers in the United States are not taking the appropriate and necessary steps to protect nurses and other healthcare workers from COVID-19 exposure. Over the past few weeks, NNU has been conducting the first-in-the-nation survey of nurses across the country about preparedness and response to COVID-19 in their workplaces. As of March 2, 2020, more than 6,500 nurses have responded from 48 states, the District of Columbia, and the Virgin Islands. Nurse respondents work at hospitals, clinics, and other healthcare facilities. The findings of this survey indicate that most nurses report that their employers are not taking necessary steps to prevent occupational exposures to COVID-19 (Table 3). Without a mandatory standard, health care workers are left unprotected and unprepared.

Table 3: Results of NNU's Survey of Nurses Regarding Their Employers' Protections for COVID-19 Results from over 6,500 nurse respondents from 48 states, the District of Columbia, and the Virgin Islands (March 2, 2020).
44% report that their employer has provided them information about novel coronavirus and how to recognize and respond to possible cases.
58% report that their employer has instituted travel/exposure history screening for all patients with fever and/or respiratory symptoms.
29% report that there is a plan in place to isolate a patient with a possible novel coronavirus infection.
27% report having access to powered air-purifying respirators (PAPRs) on their units. 63% report having access to N95 respirators on their units.
30% report that their employer has sufficient PPE stock on hand to protect staff if there is a rapid surge in patients with possible coronavirus infections.
65% report having been trained on safely donning and doffing PPE in the previous year.
66% report having been fit tested in the previous year.
14% report that their employer has an overflow plan to place additional, trained staff to enable safe care provision to patients on isolation for novel coronavirus.
19% report that their employer has a policy to address employees with suspected or known exposure to novel coronavirus.

B. OSHA has taken similar action previously, resulting in significant protection for nurses and other healthcare workers.

OSHA has recognized the importance of worker protections against occupational exposure to infectious diseases before and taken action to pass an emergency temporary standard in response to an infectious disease outbreak. In 1989, OSHA upheld their Congressional mandate by developing an emergency temporary standard to promptly provide needed protection to health care workers occupationally exposed to bloodborne pathogens, responsive to the exposures caused by lack of employers' prevention and high morbidity and mortality from hepatitis B among healthcare workers. This emergency temporary standard and the permanent standard that

necessarily followed—the Bloodborne Pathogens Standard—subsequently significantly reduced the number of hepatitis B infections from 8,700 to 800 cases within four years of the standard's publication.[32,33]

Similarly, the emergency temporary standard requested by NNU and the subsequent permanent standard would significantly improve protections for health care workers from exposure to emerging infectious diseases like COVID-19. An emergency temporary standard is needed now in response to the current COVID-19 epidemic/pandemic and the ways that nurses and other healthcare workers are placed in grave danger.

A permanent standard on infectious diseases is needed to protect nurses and other healthcare workers from hazards posed by infectious diseases not covered by the Bloodborne Pathogens Standard, including emerging infectious diseases. NIOSH and OSHA have long recognized the hazard posed by infectious diseases in healthcare workplaces.[34,35] In fact, in response to a union petition, OSHA has completed significant work on developing an infectious diseases standard, establishing clearly the need for such a standard.[36] However, such standard has been placed on OSHA's long-term regulatory agenda since Spring 2017.

The current COVID-19 pandemic demands immediate action from OSHA to ensure that nurses and other healthcare workers maintain their essential right to a safe and healthful workplace and to help reduce further community spread among health care workers and the public.

III. OSHA should include these fundamental elements of an Emergency Temporary Standard to Protect Nurses and Other Healthcare Workers from Exposure to Emerging Infectious Diseases.

A. Such an Emergency Temporary Standard on emerging infectious diseases must be based on the precautionary principle.

To protect nurses and other healthcare workers from the hazards posed by emerging infectious diseases, like COVID-19, OSHA should construct an emergency temporary standard that is based on the precautionary principle. The precautionary principle states that "When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause-and-effect relationships are not fully established scientifically."[37]

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[32] U.S. Occupational Safety and Health Administration, (Nov 27, 2001), "OSHA Archive: CPL 02-02-069 (formerly CPL 2-2.69): Section VII Background," online at https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=directives&p_id=2570#VII.

[33] Jeffress, Charles N., (June 22, 2000), "OSHA Archive: STATEMENT OF CHARLES N. JEFFRESS BEFORE THE SUBCOMMITTEE ON WORKFORCE PROTECTIONS HOUSE EDUCATION AND THE WORKFORCE COMMITTEE," online at https://www.osha.gov/news/testimonies/06222000.

[34] U.S. National Institute for Occupational Safety and Health, (last reviewed Jan 13, 2017), "HEALTHCARE WORKERS: Infectious Agents," online at https://www.cdc.gov/niosh/topics/healthcare/infectious.html.

[35] U.S. Occupational Safety and Health Administration, "Healthcare: Infectious Diseases," online at https://www.osha.gov/SLTC/healthcarefacilities/infectious_diseases.html.

[36] U.S. Occupational Safety and Health Administration, "Infectious Diseases Rulemaking," online at https://www.osha.gov/dsg/id/.

[37] Hayes, AW, (2005), "The precautionary principle." *Arh Hig Rada Toksikol*, 56(2): 161-6.

The precautionary principle should govern all decisions made about protections for an emerging infectious disease as it emphasizes anticipatory action. Following the precautionary principle is necessary to protecting nurses and other healthcare workers from the hazard posed by an emerging infectious disease where little may be known. Nurses and other healthcare workers have a fundamental right to a safe and healthful workplace and infectious diseases should be no exception. In addition, the full protection of healthcare workers is a fundamental and necessary part of limiting the spread of viruses—this has been proven time and again with SARS, MERS, H1N1, Ebola, and others. It is critical that nurses and other healthcare workers are kept safe not only to provide critical care for patients with potential COVID-19 infection, but also to continue caring for other patients.

B. Several elements must be implemented by healthcare employers to protect nurses and other healthcare workers and therefore should be included in OSHA's emergency temporary standard. In response to COVID-19, as with other emerging infectious diseases, health care employers must have in place comprehensive exposure control plans that must include the proper screening and isolation procedures, engineering controls, the highest standard of personal protective equipment (PPE), safe staffing, and other protections. It is of importance that healthcare employers also make plans and preparations to safely respond to a possible surge in patients with COVID-19. All protections must be implemented in a proactive, preventive manner; when they are implemented in reaction to confirmed cases or in reaction to healthcare worker exposures, that endangers the health and safety of nurses and other healthcare workers.

OSHA has many resources on which to draw in developing an emergency temporary standard on emerging infectious diseases like COVID-19. The California Division of Occupational Safety and Health (Cal/OSHA) has a long-standing enforceable standard that addresses many of the necessary elements for protecting nurses and other healthcare workers from infectious diseases not covered by the Bloodborne Pathogens Standard, including emerging infectious diseases.[38] Cal/OSHA's Aerosol Transmissible Diseases Standard should serve as a baseline for OSHA's work on an emergency temporary standard responsive to COVID-19 as well as a subsequent permanent standard. In addition, OSHA has released guidance regarding COVID-19 for healthcare and other industries, which includes some of the following necessary elements.[39]

The following elements are necessary, at minimum, to protect nurses and other healthcare workers from COVID-19. Healthcare employers should:

- Communicate clearly with nurses and other staff regarding COVID-19 preparation, protocols, and any confirmed or suspected cases in the facility. When employers do not communicate clearly with staff it opens the door to misinformation and confusion which creates additional risk of transmission. Employers should ensure that nurses and other healthcare workers receive effective training and education regarding their plans, protocols, preparations, and response to COVID-19. Such training and education should

[38] 8 CCR §5199; Also see California Department of Public Health, (Jan 2018), "Cal/OSHA's Aerosol Transmissible Disease Standards and Local Health Departments," online at https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/OHB/CDPH%20Document%20Library/ATD-Guidance.pdf.
[39] U.S. Occupational Safety and Health Administration, "COVID-19: Control and Prevention," online at https://www.osha.gov/SLTC/covid-19/controlprevention.html#health.

be implemented proactively, in preparation for a possible COVID-19 case, rather than "just in time," after a COVID-19 case has arrived at the facility, when it is too late.

- Implement screening protocols to promptly identify and isolate patients with possible COVID-19 infections at the first point of contact/entry in the healthcare facility or before arrival at the healthcare facility. Such protocols should be proactive and preventive, based on the precautionary principle, rather than reactive.

- Ensure prompt isolation of patients with possible COVID-19 infection. These patients should be placed in airborne infection isolation rooms until COVID19 or other infectious disease has been ruled out. These airborne infection isolation rooms must be constructed and consistently maintained so that they provide protection to staff and patients. A separate waiting area should be established for any patients or visitors with respiratory symptoms to prevent exposures.

- Provide the highest level of PPE to nurses and other health care workers who are providing care to patients with possible COVID-19 infections. PPE should be selected based on the precautionary principle. For COVID-19, NNU maintains that the highest level of PPE includes a powered air purifying respirator (PAPR), coveralls that are impervious to viral penetration (meeting ASTM F1671/ISO 16604 standards), and gloves.[40] All respiratory protection should be implemented as required by OSHA's Respiratory Protection Standard, including annual fit testing for respirators requiring a fit test, training and education, and other requirements.[41] Health care employers must have in-person, hands-on training and education for all nurses and other health care workers regarding PPE and safe donning and doffing practices. Again, such training and education should be implemented proactively, in preparation for a possible COVID-19, rather than "just in time," after a COVID-19 case has arrived at the facility, when it is too late.

- Make staffing assignments to ensure that nurses and other health care workers caring for patients with possible or confirmed COVID-19 infections are able to do so safely. When patients are on isolation, additional time is needed to safely don and doff PPE. Wearing PPE can be extremely physically taxing; nurses who need to wear PPE ensembles for long periods of time should be given breaks and relief when needed. Additional staff may be necessary to assist nurses and other health care workers in donning and doffing PPE safely. Ensuring that nurses providing care to patients with possible or confirmed COVID-19 infections are, at minimum, on 1:1 assignments can help prevent unintentional spread of the virus via contaminated objects or surfaces.

- Implement effective procedures to identify any possible occupational exposure and to follow up immediately with affected staff. If a nurse or other health care worker is placed on precautionary leave, that leave must last for at least the minimum incubation period

[40] National Nurses United, (Feb 16, 2020).
[41] 29 CFR §1910.134

and the employer must maintain all pay, seniority, and benefits for the entire length of the leave.

- Maintain sufficient PPE stock and supply to protect nurses and other healthcare workers, including during a possible surge in patients with respiratory symptoms. In the context of worldwide and regional PPE shortages, rationing or reuse of PPE should be implemented only after all other avenues have been exhausted, and nurses' professional judgment on when it is safe to reuse or conserve respirators must be heeded. Stockpile and procurement plans and procedures must be in place to ensure respiratory and PPE supplies are readily accessible.

- Begin preparation immediately for a potential surge of patients with respiratory symptoms, which should include at least preparing separate waiting areas such as surge tents, preparing plans to deal with significant numbers of patients such as overflow areas, ensuring staff are aware of surge plans before implementation, establishing plans to respond if significant numbers of healthcare workers are exposed or sick and unable to work.

- Make a COVID-19 vaccination available, in the event it is developed, for free and in a time and place convenient to their work to nurses and other healthcare workers.

- Develop robust housekeeping and environmental cleaning protocols and plans. Such housekeeping and environmental cleaning protocols should be based on the precautionary principle, providing the highest level of protection without waiting for scientific evidence that it is necessary. Employers must consider all aspects of environmental cleaning, including specific ensuring that common, public areas are cleaned effectively following identification of a possible or confirmed COVID-19 case. This must also include protocols to respond if a patient with COVID-19 must leave the negative pressure isolation room to travel through the facility for medical procedures or care.

- Establish and maintain clear records of their implementation of these protective measures, any and all exposures to COVID-19 and what follow-up occurred, and other records.

Nurses and other health care workers stand ready and willing to provide care that patients with COVID-19 need, but they need strong protections from their employers to be able to do so safely. All health care workers must receive the highest level of protection in their workplaces, as determined by the precautionary principle. We urge OSHA to take immediate action to protect nurses and other healthcare workers from COVID-19 by granting this petition and issuing and enforcing an emergency temporary standard. If you have any questions, please reach out to Jane Thomason at 510-433-2771 or jthomason@nationalnursesunited.org.

Sincerely,

Bonnie Castillo, RN
Executive Director
National Nurses United

CC: Vice President Mike Pence
Ambassador Deborah Birx, White House Coronavirus Response Coordinator
Secretary Alex Azar, Department of Health and Human Services
Dr. Robert Redfield, Director, Centers for Disease Control and Prevention
Dr. Anthony Fauci, Director, National Institute of Allergy and Infectious Diseases
The Honorable Nancy Pelosi, Speaker, US House of Representatives
The Honorable Kevin McCarthy, Minority Leader, US House of Representatives
The Honorable Mitch McConnell, Majority Leader, US Senate
The Honorable Chuck Schumer, Minority Leader, US Senate
All Members of the Committee on Education and Labor, US House of Representatives
All Members of the Committee on Oversight and Government Reform, US House of Representatives
All Members of the Energy and Commerce Committee, US House of Representatives
All Members of the Health, Education, Labor & Pensions Committee, US Senate
All Members of the Committee on Homeland Security and Governmental Affairs, US Senate
Mr. Andy Levinson, Deputy Director, Directorate of Standards and Guidance, OSHA
Ms. Maureen Ruskin, Deputy Director, Directorate of Standards and Guidance, OSHA
Mr. J. Joseph Wheeler, Deputy Assistant Secretary, Office of Congressional and Intergovernmental Affairs, Department of Labor

ATTACHMENT 4

National Nurses United Letter to the Committee on Oversight and Reform re: Changes to the CDC's Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 in Healthcare Settings (March 12, 2020)

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The National Voice for Direct-Care RNs

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March 12th, 2020

Committee on Oversight and Reform
U.S. House of Representatives
Chairwoman Carolyn B. Maloney
2157 Rayburn House Office Building
Washington, D.C. 20515

Dear Chairwoman Maloney, Ranking Member Jordan, and Members of the Committee,

National Nurses United is the largest union of registered nurses in the United States, representing more than 155,000 RNs across the country. We have been closely monitoring the outbreak of novel coronavirus (COVID-19) and urgently working to protect nurses, health care workers, and the public from COVID-19 infection. We write to you today in advance of your hearing this afternoon, March 11th, "Confronting the Coronavirus: The Federal Response," regarding our concerns about the guidance from the Center for Disease Control (CDC) on measures to contain COVID-19 in healthcare settings.

Over the past week, the CDC has made multiple changes that weaken their guidance on measures to contain COVID-19, and the new recommendations are dangerous for nurses, health care workers, and patients. On March 10th, 2020, the CDC updated the Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 in Healthcare Settings, and made the following changes:

- Weakening personal protective equipment (PPE) standards by allowing the use of surgical masks as a replacement for respirators when working with a patient with known or suspected COVID-19 infection. Previously, the CDC required that all workers must use N-95 respirators or a higher level of protection, when working with patients with known or suspected COVID-19 infection. In the new guidance, the CDC prioritizes the use of respirators only for aerosol generating procedures (such an intubation or bronchoscopy). This change is extraordinarily dangerous for nurses and other health care workers, because surgical masks will not protect them from exposure to COVID-19. Workers are at risk of exposure at all times when caring for patients with confirmed or suspected COVID-19.

- Reducing worker and patient protections in facilities by changing recommendations on the use of airborne infection isolation rooms (AIIR). The CDC has changed the guidance to only recommend the use of AIIRs when patients are undergoing aerosol-generating procedures. This change puts patients and health care workers in every facility at risk, and the CDC should instead require that any patient with known or suspected COVID-19 infection should be placed in an AIIR. Aerosol-generating procedures may need to be performed unexpectedly and immediately for patients with severe or critical COVID-19 infections. The CDC's guidance is unacceptably weak and does not reflect patient care needs.

- Weakening protections for health care workers collecting diagnostic respiratory specimens. The new guidelines allow the collection of diagnostic respiratory specimens to be collected in a normal examination room, instead of in an AIIR. It also allows the health care workers collecting the specimens to use surgical masks if a respirator is not available. Both of these changes put other patients and health care workers at risk as collecting diagnostic respiratory specimens commonly generates aerosols (e.g., through patient coughing) and requires that the healthcare worker be very close to the patient's mouth during specimen collection. This is a very concerning weakening of the CDC's guidance that will result in high numbers of exposures and possible infections to nurses and other healthcare workers.

In the last week, the CDC has updated the Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with Coronavirus Disease by making the following change:

- Allowing exposed asymptomatic workers to work if the facility decides that is appropriate or necessary. Last week, the CDC updated their Interim U.S. Guidance for Risk Assessment and Public Health Management of Healthcare Personnel with Potential Exposure in a Healthcare Setting to Patients with COVID-19, to allow facilities to let asymptomatic workers who have been exposed to a COVID-19 patient continue to work. Given the increasing evidence of the role of asymptomatic infections in transmission of COVID-19, this is an unacceptable weakening of the CDC's guidance.

These changes to CDC guidance on COVID-19 are irresponsible and put nurses, health care workers, and patients at risk. When we learned of the potential changes the CDC might make to the guidance, National Nurses United expressed our concerns to CDC staff in multiple phone meetings, emails, and a formal letter from NNU and twelve other unions. We are dismayed that the CDC has not taken our feedback and recommendations and has instead chosen to put our workers and patients at further risk of COVID-19 infection.

We are currently facing a major public health crisis, and this is not the time to be weakening our standards and protections for health care workers and patients. We urge the Committee to demand that the CDC immediately rescind and revise its guidelines during the hearing this afternoon. For your reference, we have attached detailed letters sent by the NNU to the CDC, the Administration, and Congress over the past few weeks.

If you have any questions or concerns, please contact our Lead Legislative Advocate, Amirah Sequeira, at ASequeira@nationalnursesunited.org, or by phone at 240 447 0034.

Sincerely,

Deborah Burger

Deborah Burger, RN
President, National Nurses United

Attachments:
Letter from NNU to National Center for Immunization and Respiratory Disease, Feb 19th 2020
Letter from NNU to the Administration and Congress, March 2nd 2020
Letter to CDC Incident Manager for Coronavirus, March 4th 2020
Letter from Labor Unions to CDC, March 6th 2020

ATTACHMENT 5

National Nurses United Letter to President Donald Trump re: Defense Production Act (April 2, 2020)

National Nurses United
The National Voice for Direct-Care RNs

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April 2nd, 2020

President Donald J. Trump
The White House
1600 Pennsylvania Ave NW
Washington D.C. 20500

Dear Mr. President:

Registered nurses, doctors, and other health care workers are currently risking their lives to care for patients during the pandemic outbreak of novel Coronavirus (COVID-19). Across the nation, our health care workforce does not have the personal protective equipment it needs to safely care for patients without risking exposure to the virus. As a result, health care workers are at risk of illness and death, which puts our entire health care system at risk of collapse. Further, when health care workers are exposed to the virus, they risk transmitting the virus to their families, patients, and communities.

If our country fails to immediately protect our health care workers, we will fail to contain the COVID-19 pandemic.

The Office of the President has the unique authority to immediately rectify this crisis. We write to you today on behalf of the 155,000 registered nurses represented by National Nurses United to urge you to use the full powers of the presidency available under the Defense Production Act (50 U.S.C. §§ 4501 et seq.) to dramatically and immediately ramp up production and distribution of personal protective equipment for health care workers and other medical equipment and supplies essential to the COVID-19 response.

The production and distribution of the following equipment and supplies must be prioritized in actions taken under the Defense Production Act:

- Respirators for health care workers and other at-risk workers
    - N95s: N95 respirators are the minimum protection needed for health care workers during patient care for suspected and confirmed COVID-19 patients. HHS estimates that the country will need 3.5 billion N95s to get through this pandemic safely.[1]
    - Powered Air Purifying Respirators (PAPRs): These respirators are necessary for aerosol generating procedures and are an effective and preferred alternative to N95s as they are reusable and do not require fit testing.

[1] See Oral Testimony by Dr. Robert Kadlec, Assistant Secretary for Preparedness and Response, U.S. Department of Health and Human Services, U.S. Senate Committee on Health, Education, Labor & Pensions, "Hearing on an Emerging Disease Threat: How the U.S. Is Responding to COVID-19, the Novel Coronavirus" (Mar. 3, 2020), available at https://www.help.senate.gov/hearings/an-emerging-disease-threat-how-the-us-is-responding-to-covid-19-the-novel-coronavirus.

- Face Shields.
- Gloves, Coveralls and Gowns.
    - Coveralls must be impermeable to viral penetration based on the American Society for Testing and Materials (ASTM) standard.
    - Gowns must be fluid resistant or fluid impermeable.
- COVID-19 Testing Equipment and Supplies: All reagents, equipment, and other supplies necessary to conduct testing for COVID-19, including swabs.
- Ventilators and Extracorporeal Membrane Oxygenation (ECMO) machines

The Executive Orders and Presidential Memorandum issued by the White House regarding the use of the Defense Production Act thus far do not fully exercise the Presidential authority under the statute. While we applaud the first steps you have taken to use the Defense Production Act, particularly the use of Title I to order ventilator production by General Motors, we urge further action. We recommend you take the following steps to use this authority to its greatest extent possible in order to protect the well-being of the United States against COVID-19:

1. **INVOKE TITLE III OF THE DEFENSE PRODUCTION ACT IMMEDIATELY:** Title III of the Defense Production Act grants the President the authority to require manufacturers to increase production of essential materials and resources through loan guarantees, subsidies, and the installation of needed equipment in industrial facilities. The President should use Title III to both order existing producers of necessary equipment to increase their production capacity and to require manufacturing facilities that do not currently produce this equipment to begin manufacturing it instead of their normal products. In the Executive Order issued on March 27th, 2020, the President delegated the authorities under Title III to the Secretaries of the U.S. Department of Health and Human Services and the U.S. Department of Homeland Security but fell short of ordering either Secretary to exercise those authorities or to do so immediately. We urge the President to:
    a. Immediately direct increased production of COVID-19 response resources for existing manufacturers. This could include the use of the Defense Production Act Fund to increase the capacity of these production facilities, which could include expanding production hours, expanding production facilities, or hiring additional workers.
    b. Immediately direct other industrial manufacturing facilities to transition to production of the equipment and supplies needed for the COVID-19 response. This could include using the Defense Production Act fund to procure and install the necessary equipment needed for this manufacturing.
    c. Immediately generate manufacturing purchase orders upon invoking the full extent of Title III, to ensure the most expedient production of essential equipment and supplies.

    The Trump Administration has invoked Title III of the Defense Production Act multiple times for production related to the U.S. Department of Defense.[2] We strongly urge the President to once again make use of this authority to save the lives of our health care workers and our patients.

[2] The Trump Administration has used Title III of the Defense Production Act to increase production 16 times with respect to national security and defense projects. See whitehouse.gov at https://www.whitehouse.gov/search/?s=%22defense+production+act+of+1950%22&wpsolr_fq%5B0%5D=issue_str%3ANational+Security+%26amp%3B+Defense

2. **DIRECT HHS TO GATHER INFORMATION ON SUPPLIES AND IMPLEMENT RESTRICTIONS ON HOARDING:** In Executive Order 13910, the President delegated authorities under Title I of the Defense Production Act to the HHS Secretary to gather information from private entities on the supply and distribution of health and medical resources necessary to respond to the spread of COVID-19. Executive Order 13910 also delegates to the HHS Secretary, authority under the Defense Production Act to restricting hoarding of health and medical resources necessary to respond to the spread of COVID-19. To ensure that HHS acts in the most expedient manner, the President should immediately direct the HHS Secretary to gather such information on the equipment and supplies necessary to the COVID-19 response and to restrict hoarding of such equipment and supplies.

3. **IMMEDIATE AND CONTINUED RELEASE AND DISTRIBUTION OF PERSONAL PROTECTIVE EQUIPMENT, TESTING EQUIPMENT, VENTILATORS AND ECMO MACHINES IN THE STRATEGIC NATIONAL STOCKPILE.** It is necessary that the Administration ensure that all existing and future supplies of essential equipment is distributed immediately to the health care facilities and workers that need them.

The Defense Production Act was created to allow our country to quickly and successfully respond to national emergencies. The size, scale, and dire outcomes of the COVID-19 pandemic necessitate the immediate use of the full powers of the Defense Production Act. The lives of our nurses, doctors, health care workers, and patients depend on it.

We urge President Trump to respond swiftly to the urgent needs of our nurses and health care workforce by using the full powers of the Presidency to ensure we have the equipment and supplies we so urgently need.

Sincerely,

Bonnie Castillo, RN
Executive Director, National Nurses United

Zenei Cortez, RN
President, National Nurses United

Deborah Burger, RN
President, National Nurses United

Jean Ross, RN
President, National Nurses United

cc :
Vice President Mike Pence
Ambassador Deborah Birx, White House Coronavirus Response Coordinator
Secretary Alex Azar, Department of Health and Human Services
Dr. Robert Redfield, Director, Centers for Disease Control and Prevention
Dr. Anthony Fauci, Director, National Institute of Allergy and Infectious Diseases
The Honorable Nancy Pelosi, Speaker, United States House of Representatives
The Honorable Kevin McCarthy, Minority Leader, United States House of Representatives
The Honorable Mitch McConnell, Majority Leader, United States Senate
The Honorable Chuck Schumer, Minority Leader, United States Senate
All Members of the House Committee on Education and Labor
All Members of the House Committee on Oversight and Government Reform
All Members of the House Energy and Commerce Committee
All Members of the Senate Health, Education, Labor & Pensions Committee
All Members of the Senate Committee on Homeland Security and Governmental Affairs

ATTACHMENT 6

NNU Fact Sheet:
Nurses Need Urgent Congressional Action to Save Lives During this Pandemic

Nurses Need Urgent Congressional Action to Save Lives During this Pandemic

The outbreak of coronavirus disease 2019 (COVID-19) has quickly become a global pandemic, and registered nurses are on the front lines of the COVID-19 response. At health care facilities across the country, many nurses and other health care workers are caring for suspected and confirmed COVID-19 patients without the use of appropriate personal protective equipment (PPE). This not only puts nurses at risk of exposure, but is putting their patients, coworkers, families, and communities at risk as well. Further, nurses and other health care workers cannot provide health care if they are sick, and we risk the collapse of our health care system if we don't ensure these health care workers are protected. The Trump Administration and the U.S. Congress need to immediately guarantee that frontline nurses and other health care workers have the PPE they need to care for their patients during this pandemic.

Health Care Workers Are Not Being Provided the Personal Protective Equipment They Need

» In order to safely care for suspected and confirmed COVID-19 patients, nurses need the following equipment:

- Respirators. N95 respirators provide the minimum protection needed for all patient care during this pandemic. Powered air purifying respirators (PAPRs) are necessary for aerosol generating procedures and are an effective and preferred alternative to N95s as they provide a higher level of protection, are reusable, and do not require fit testing.
- Face shields or goggles.
- Gloves and coveralls or gowns that are impermeable to viral penetration based on the American Society for Testing and Materials (ASTM) standard, and are fluid-resistant or fluid-impermeable.

» The U.S. Centers for Disease Control and Prevention (CDC) has repeatedly downgraded its guidance on the appropriate PPE for health care workers to wear. In the early days of this outbreak, the CDC correctly recommended N95 respirators for health care workers treating suspected or confirmed COVID-19 patients. The CDC has since severely weakened its guidance, recommending that it is sufficient for health care workers to wear surgical masks, scarves, or bandanas when performing care for suspected or confirmed COVID-19 patients that does not include aerosol-generating procedures or high hazard procedures. This guidance ignores the growing body of evidence on airborne transmission of SARS CoV-2, the virus responsible for COVID-19, as well as established scientific evidence of airborne transmission of SARS-CoV and MERS. Hospital employers have used the CDC guidance as their excuse not to provide the optimal PPE protection for nurses and other health care workers, resulting in large numbers of health care workers contracting the virus. Guidance to protect health care workers must be based on science, not inventory.

OUR PATIENTS. OUR UNION. OUR VOICE.

National Nurses United

» National Nurses United (NNU) members at hospitals across the country have reported dangerous working conditions that compound the risks that nurses already face due, in some cases, to a limited supply of PPE, and, in other cases, due to a refusal by hospital management to provide the proper PPE to nurses. Many hospitals are using the CDC's weakened guidance to justify implementing the lowest level of protection and providing no or inadequate PPE. Some of the most common dangerous practices include:

- Hospital management withholding access to PPE from nurses and health care workers who are caring for suspected or confirmed COVID-19 patients.
- Hospital management prohibiting nurses and other health care workers from using N95 respirators or other respirators when caring for suspected or confirmed COVID-19 patients.
- Hospital management threatening disciplinary action when nurses and other health care workers wear at work respirators or masks brought from home.
- Hospital management directing workers to reuse N95 respirators and surgical masks during their shift, or over the course of multiple shifts despite the health risks of doing so.
- Hospital management directing workers to use expired N95 respirators and other expired equipment despite the health risks of doing so.
- Hospital management requiring workers to work within 14 days of exposure to suspected or confirmed COVID-19 patients.

» Failing to protect these workers has already resulted in tens of thousands of health care workers and emergency responders becoming infected — many are seriously ill and many have died. Even with massive gaps in testing and tracking of COVID-19 cases, a handful of states have released limited data demonstrating the high rates of infection for health care workers, reporting that between 10 and 20 percent of confirmed COVID-19 cases are health care workers.

Why Aren't Nurses Being Protected?

1. There is no federal OSHA standard or enforcement mechanism to ensure that hospitals and other health care employers protect their workers during an emerging infectious disease outbreak.
2. Distribution Issues — Although we are told that some portion of the federal and state stockpiles of respirators have been released to some hospitals, frontline workers in many facilities have not seen evidence of it in their hospital units.
3. Lack of Stock — Although no reliable statistics exist on the inventory of PPE throughout the United States, it is apparent that the country does not have the stock of respirators and other PPE that we need to protect health care workers during the pandemic. The U.S. Department of Health and Human Services (HHS) estimates that the country will require at minimum 3.5 billion N95 respirators to see us through this pandemic. HHS estimated in early March 2020 that the U.S. had only 1 percent of the N95 respirators needed.

Congress Must Mandate that OSHA Issue an Emergency Temporary Standard to Protect Nurses and Other Health Care Workers During the COVID-19 Pandemic

» An OSHA Emergency Temporary Standard to protect health care workers and other at-risk workers from COVID-19 exposure must mandate that health care employers do the following:

- Provide the highest level of PPE to nurses and other health care workers who are providing care to patients with suspected or confirmed COVID-19 infections, including PAPRs, coveralls that are impervious to viral penetration (meeting ASTM F1671/ISO 16604 standards), and gloves.

- Maintain sufficient PPE stock and supply to protect nurses and other health care workers, including during a surge in patients with respiratory symptoms.
- Ensure all respiratory protection should be implemented as required by OSHA's Respiratory Protection Standard, including annual fit testing for respirators requiring a fit test, training and education, and other requirements.
- Conduct in-person, hands-on training and education for all nurses and other health care workers regarding PPE and safe practices for putting on and taking off PPE.
- Have stockpile and procurement plans and procedures in place to ensure respiratory and PPE supplies are readily accessible.
- These protections are embedded in the COVID-19 Health Care Workers Protection Act (H.R. 6139/S. 3475), introduced by Rep. Bobby Scott and Senator Tammy Duckworth.
- It is critical that Congress does not allow the hospital and health care industry or the Trump Administration to block issuance and enforcement of this standard.

Congress Must Mandate that the President Invoke the Defense Production Act to Increase Production of Needed PPE

» President Trump should utilize the full powers of the presidency available under the Defense Production Act (50 U.S.C. §§ 4501 et seq.) to dramatically and immediately ramp up production and distribution of PPE for health care workers and other medical equipment and supplies essential to the COVID-19 response. Given that President Trump has failed to utilize his statutory authority to do so, Congress must act to mandate the production of these badly needed equipment and supplies.

» The production and distribution of the following equipment and supplies must be prioritized in actions taken under the Defense Production Act:

- Respirators: N95s and powered air purifying respirators (PAPRs)
- Face shields
- Gloves
- Coveralls
- Gowns
- COVID-19 testing equipment and supplies
- Ventilators and extracorporeal membrane oxygenation (ECMO) machines
- Medications necessary in the treatment of COVID-19

Given that President Trump has failed to exercise his authority to produce this needed equipment, Congress must act immediately to require him to do so in the fourth COVID-19 legislative package. Congress should mandate that the President identify private sector capacity to produce needed PPE and medical equipment and exercise the authorities provided by the Defense Production Act necessary to require emergency production of 3.5 billion N95 respirators, and necessary quantities of PAPRs, coveralls, gowns and gloves, testing equipment and supplies, face shields, ventilators ECMO machines, and medications needed for the COVID-19 response.

ATTACHMENT 7

NNU Recommendations: Model Standards for COVID-19 Surge, Hospital Preparation, Response and Safety (April 20, 2020)

Model Standards for COVID-19 Surge »
Hospital Preparation, Response, and Safety

This document lays out the steps hospitals should take to prepare to protect patients, nurses, and other health care workers during COVID-19 surges. These measures are necessary to prevent transmission of COVID-19 within hospitals. These standards are based on and informed by models employed by hospitals internationally to effectively respond to COVID-19 patient surges, successfully prevent spread of COVID-19 within facilities, and to protect nurses and other health care workers.

» Limit possible introduction of virus into the health care facility:
- Postpone indefinitely all appointments for routine medical care that can be delayed without undue risk to the current or future health of a patient (e.g., annual physical, elective surgery).
- Eliminate/restrict visitor access. Consider allowing for end-of-life and other limited exceptions.

» Institute "universal precautions" for COVID-19 — given evidence indicating infectivity of asymptomatic infections and lack of widespread testing, assume that each patient has COVID-19 and implementing precautions accordingly.[1]
- This should include precautions for the whole facility:
  - Universal source control procedures to reduce potential for transmission within the facility — would include universal masking[2] (all patients and staff wear surgical masks at all times, except when higher level of PPE needed), thorough education and enforcement regarding hand hygiene and cough etiquette for patients and staff.
  - Consistent and regular environmental cleaning and disinfection, including disinfecting of floors, walls, furniture, surfaces, objects, etc. at least three times per day. Should be conducted with cleaning chemicals that contain a disinfectant known to be effective against SARS-CoV-2.
  - Add air cleaning equipment to ventilation systems, such as UV cleaners, HEPA filter units, others.
- Outdoor triage[3] should be implemented to prevent transmission within crowded waiting rooms. Facilities should create designated "zones."
  - Limit to one entrance to the hospital and set up outdoor triage area where patients are promptly triaged and sent to the appropriate "zone."
- Establish three zones within the facility, using the "three zones, two passages" model that has been successfully implemented in China, Taiwan, and other locations to prevent transmission of virus within health care facilities. See chart next page.
  - Three zones: infectious zone, potentially infectious zone, and a clean zone — clearly demarcated. Two buffer zones between the contaminated zone and the poten tially contaminated zone.
  - Passageway is established for the one-way transport of contaminated items, only in direct from clean » potentially contaminated » contaminated zones. Items may not be removed from the contaminated zone unless disinfected.
  - Strict procedures for donning and doffing PPE between zones, including hands on training, full-length mirrors, and observation by trained personnel. Use dedicated walkways to prevent transmission of virus between zones.
  - Transport of patients and health care workers through the facility is tightly controlled to prevent transmission/ contamination.
- All patients should be considered "suspected COVID-19 cases" until confidently ruled out or confirmed »

All patients are considered suspected COVID-19 patients.

Confirmed patient » positive test for COVID-19.

- Ideally, point-of-care rapid testing would be employed for all patients entering facility.

Suspected patient » Patients who are neither confirmed or ruled out should continue to be considered suspected patients until confirmed, ruled out, or discharged.

- Should include patients who test negative but who have clinical manifestations and/or epidemiologic factors for COVID-19. These patients should continue to be tested daily.

Ruled out patient meets three criteria »

1. Two negative tests at least 24 hours apart.
2. NO clinical manifestations of COVID-19, which would include:
   - Fever and/or respiratory symptoms.
   - CT imaging features of COVID-19.
   - White blood cell count is normal or decreased.
3. No epidemiological factors:
   - International travel in 14 days before developing symptoms.
   - History of contact with confirmed COVID-19 case in 14 days before developing symptoms.
   - History of contact with person with fever and/or symptoms of respiratory illness within 14 days before developing symptoms.

Patients are then placed into the appropriate unit/floor — see next page.

Patients are then placed into the appropriate units/floor »

	Confirmed patients » "Infectious zone"	Suspected patients » "Potentially infectious zone"	Ruled out patients » "Clean zone"
Room type	Multiple patient rooms okay. Open wards okay.	Single rooms only.	Single rooms preferred.
Negative pressure	Yes, entire unit/floor should be under negative pressure.	Rooms should be under negative pressure. Consider converting entire unit/ floor to negative pressure.	Use precautions typical for care required by patient.
Staffing	• Dedicated teams who work only in this zone of the hospital. • Shifts should be limited (China used max four hours). • Teams of health care workers should be rotated.	• 1:1 assignments plus additional staff for donning and doffing PPE safely and for breaks and relief. • Dedicated teams who work only in this zone of the hospital.	• Use precautions typical for care required by patient. • Dedicated teams who work only in this zone of the hospital.
Health care worker protections	• All health care workers and all workers (e.g., environmental services staff) entering this ward should don full PPE before entry, should wear full PPE while working in this ward, and should not change between patients. • Tightly monitor entry/ exit of staff from isolation unit to ensure PPE doffing and disinfection is completed successfully.	• Universal source control, including all patients and staff wear surgical masks unless higher level of PPE required. • Change PPE between patients.	• Universal source control, including all patients and staff wear surgical masks unless higher level of PPE required. • Use additional precautions typical for care required by patient (e.g., maintain precautions for patient with TB).
PPE	• PPE of the highest level — coveralls, PAPRs, shoe covers, head covers, gloves. • Temporary scrubs.	• PPE of the highest level — coveralls, PAPRs, shoe covers, head covers, gloves. • N95 and fluid-resistant or impermeable gown as minimum. • Temporary scrubs.	• Use precautions typical for care required by patient.
Other considerations	• Strictly limit who enters the unit/floor. • Should include units for both ICU and med/surg level of care.	• Should include units for both ICU and med/surg level of care.	

» Occupational exposure prevention, surveillance, and response to prevent transmission to and by health care workers.

- Opt-out process for RNs at higher risk of complications from COVID-19 such as older adults and people who have serious chronic medical conditions.
- Accommodations for frontline staff working in hospital, including provision of nutritious meals.
- Ongoing monitoring of health of frontline staff. If develop fever or other symptoms of COVID-19, they should be isolated immediately and tested at employer's expense. Any RN who has worked in the facility within 14 days of developing symptoms should have presumptive eligibility for workers compensation.
- Employer should provide temporary scrubs and facilities for staff to shower and change before going off duty.
- No mandatory overtime. Breaks and relief should be provided. Maximum number of hours working in PPE should be enforced (hospitals in China used four hours max).

» Employers should develop procedures to ensure safe handling of deceased patients with COVID-19.

Additional measures:

» Contact tracing — immediate and strict quarantine of contacts of all newly identified cases

- Could consider adopting some of the strategies from Ebola, where all contacts of a case were tracked and all contacts of the contacts were also tracked.

» Consider universal masking of population in addition to national stay-at-home order.

Endnotes

1 The evidence that asymptomatic infections are occurring and are infectious is accumulating rapidly. Asymptomatic and pre-symptomatic infections clearly appear to be important to how rapidly this virus is transmitted.

2 Several countries have included this element in their effective responses, including China, Taiwan, Hong Kong, among others.

3 The terminology used in China was "fever clinics".

ATTACHMENT 8

NNU Statement:
Position on COVID-19 Public Reopening.
(Last Update: May 1, 2020)

Updated 5/1/2020

NNU Position on COVID-19 Public Reopening

The point of social distancing is to slow the spread of the virus — both to reduce the number of people infected and to prevent a rapid surge in patients needing acute care that would overwhelm the health care system. This saves lives by reducing the number of people who get infected and by reducing the number of people needing acute care but unable to get it because of hospital capacity.

Other countries have reached the same goal — reducing cases and not overwhelming the health care system — by having a robust public health infrastructure that enables widespread surveillance, identification and strict isolation of cases, thorough contact tracing and isolation of contacts, and increasing health care capacity.

It is important to recognize that even though the United States hasn't fully implemented social distancing measures, this is the only public health tool currently being used that is responsive to the role that asymptomatic and pre-symptomatic infections play in the spread of this virus. Screening, testing, quarantine for exposed nurses, etc. have all been predicated on presence of symptoms.

TRANSITIONAL REQUIREMENTS » **Businesses etc. cannot be reopened safely until these immediate criteria are met. Criteria must be maintained at all times that non-essential businesses are open. If they cannot be maintained, non-essential business must be closed.**

ENSURING BASIC HUMAN NEEDS ARE MET » Enhanced unemployment benefits and paid sick time and family leave; food security; housing; health care; and other social supports for people who are unemployed or unable to work due to illness or quarantine and isolation measures.

PUBLIC HEALTH AND SAFETY » All workers must have personal protective equipment (PPE) and other needed health and safety protections including an OSHA emergency temporary standard on infectious diseases and enforcement capacity. Health and safety protections must be in place for people in institutions that are at high risk for outbreaks of COVID-19 including skilled nursing facilities, prisons and jails, encampments, and immigration detention centers.

PUBLIC HEALTH INFRASTRUCTURE » Need sufficient staffing, supplies, and space for robust surveillance, testing, case isolation, and contact tracing to ensure that the virus is effectively contained.

» Free, reliable polymerase chain reaction (PCR) testing must be made widely available — including to low-income communities and communities of color — regardless of known exposure or symptom status.

» Comprehensive surveillance, contact tracing, and case isolation.

  › Widespread testing for both symptomatic and asymptomatic individuals. Must have ongoing surveillance, such as repeated, random, population surveys of asymptomatic people. Syndromic surveillance that includes early detection of comparable indicators (e.g., influenza-like illness) before a diagnosis is made.

  › Thorough contact tracing must be performed to identify all contacts who could have been infected by each case. Each contact needs to be tracked and isolated.

    • Case identification, contact tracing, and isolation need to be done within the workplace as well as within the community.

    • As scientifically trained and holistic caregivers experienced in patient advocacy, nurses are uniquely qualified to provide vital assistance to our public health systems and their skill and expertise should be utilized for contact tracing.

    • Cannot rely upon technology for contact tracing.

» Clear and reliable data must be collected and made publicly available.

  › Continued reporting by health care facilities to local/state/federal government on admissions/ICU admissions/negative pressure room and ventilator availability.

  › Serological testing, including antibody testing, should be used cautiously to better understand the pandemic. Serological testing should not be used, at this point, to inform policy making.

  › Transparent, real-time reporting of testing data, including at least race, occupation, and county.

» Strict oversight of performance, manufacture, and distribution of both PCR and serological tests.

HEALTH CARE CAPACITY AND PREPAREDNESS » Decisions must be made based on the ability to provide needed care, not on profit/cost-saving; health care workers must be protected in order to prevent transmission; health care capacity must be expanded; and health care for all must be assured.

» **Health care worker safety:** nurses and other health care workers are the foundation of our ability to respond to the pandemic. Their safety is of the utmost importance — for them and their families, for their patients, and for all of us.

  › Precautionary principle and science must govern decisions about infection control, health and safety, and other policies.

  › Sufficient PPE: powered air-purifying respirators (PAPRs) and coveralls that incorporate head coverings and shoe coverings, and gloves must be on hand. The supply chain must be sufficiently robust to produce and distribute needed PPE for both the short and long-term. The Defense Production Act (DPA) must be utilized to its fullest extent to ensure sufficient manufacturing capacity.

  › Engineering controls need to be implemented in every health care institution across the country, including hospitals and other health care facilities including clinics and nursing facilities. Ventilation systems, including negative pressure ventilation, are vital to preventing spread of SARS-CoV-2 and other infectious diseases.

  › Safe staffing must be guaranteed in all hospitals and other health care facilities.

- Plans for surge including plans for triage, implementing the three-zone model, and expanding health care capacity.
- Occupational exposure surveillance and response plans — if a nurse or other health care worker is exposed, they must be placed on paid quarantine immediately for a minimum of 14 days.
- OSHA must pass an emergency temporary standard to mandate that health care employers put in place measures necessary for SARS-CoV-2 and capacity to enforce the standard.

» **Health care capacity for surge:**

- National public hospital and health care infrastructure capacity must be available.
  - FEMA
  - Army Corps of Engineers
  - Reverse privatization of the Veterans Health Administration (VHA):
    - Capital assets: the VA Mission Act required the VHA to perform a capital asset review and make recommendations a newly created Asset Infrastructure Review (AIR) Commission. The justification for this review was to determine where facilities are being underutilized and where they needed to increase capacity. The argument was that underutilized facilities should be closed.
      - Repurpose underutilized facilities: rather than closing underutilized facilities, we can use the AIR Commission findings to repurpose underutilized health facilities to provide national surge capacity for the current pandemic and to ensure that it is available in the future.
        - Health care facilities *(same requirements as listed below for the private sector)*
        - Isolation centers
    - Fully staff an expanded VHA: improve retention and recruitment by providing competitive wages and benefits.
- Private sector: the health care sector must be fully prepared to respond safely to future surges. This needs to be the full preparation that should have been in place to begin with. It cannot be a repeat of the reactive, half-measures we saw in the first response.
  - Beds
  - Staff
  - Ventilators and other necessary equipment, medications
  - PPE
  - Real-time, publicly reported data on hospital capacity

» **Access to health care:** people must be able get treatment they need if they get COVID-19, instead of being out in community and potentially infecting others.

- Any vaccine or treatment must be provided to all at no charge.
- Guaranteed no-cost coverage of all treatment, care, and services for people with potential COVID-19 infection whether insured, uninsured, or underinsured.

ATTACHMENT 9

NNU Recommendations:
Safety Requirements for Hospitals Reopening Procedural and Outpatient Areas
(May 4, 2020)

May 4, 2020

Safety Requirements for Hospitals Reopening Procedural and Outpatient Areas

Centers for Disease Control and Prevention (CDC) guidance still recommends postponing elective procedures, surgeries, and non-urgent outpatient visits to minimize chances of exposure.[1] If a health care facility no longer needs to adhere to these crisis standards of care, then they should be resuming optimal standards everywhere, including providing nurses the personal protective equipment (PPE) that they need.

This means the facility should be prepared to end all reuse, decontamination, rationing of N95s etc. — for inpatient areas as well as all procedures they are planning to reopen.

Hospitals reopening procedural areas should have the following safety precautions in place to prevent transmission of the virus within the facility and to protect nurses and other health care workers from exposure.

BEFORE PATIENTS ARRIVE FOR AN ELECTIVE PROCEDURE, SURGERY, OR OUTPATIENT VISIT »

- Patients should be screened for active viral infection using a reliable RT-PCR test before or upon arrival at the facility. Considerations for testing:
  - If a reliable, rapid, point-of-care test can be used upon arrival at the facility that would be ideal because it would allow testing of viral status as close to procedure as possible. Consider conducting testing before physical entry into the facility to limit possibility of exposure if patient is positive. Staff conducting testing should be wearing PPE meeting National Nurses United (NNU) standards (see below).
  - If testing must be conducted before the day of the procedure, the sample should be taken no more than 48 hours before the scheduled procedure to limit possibility of exposure or conversion between testing and procedure.
- Patients who test negative or who cannot be tested should be screened for epidemiological risk factors. Epidemiological risk factors include:
  - History of contact with a confirmed COVID-19 case in 14 days before scheduled procedure or appointment.
  - History of contact with person with fever and/or symptoms of respiratory illness within 14 days before scheduled procedure or appointment.

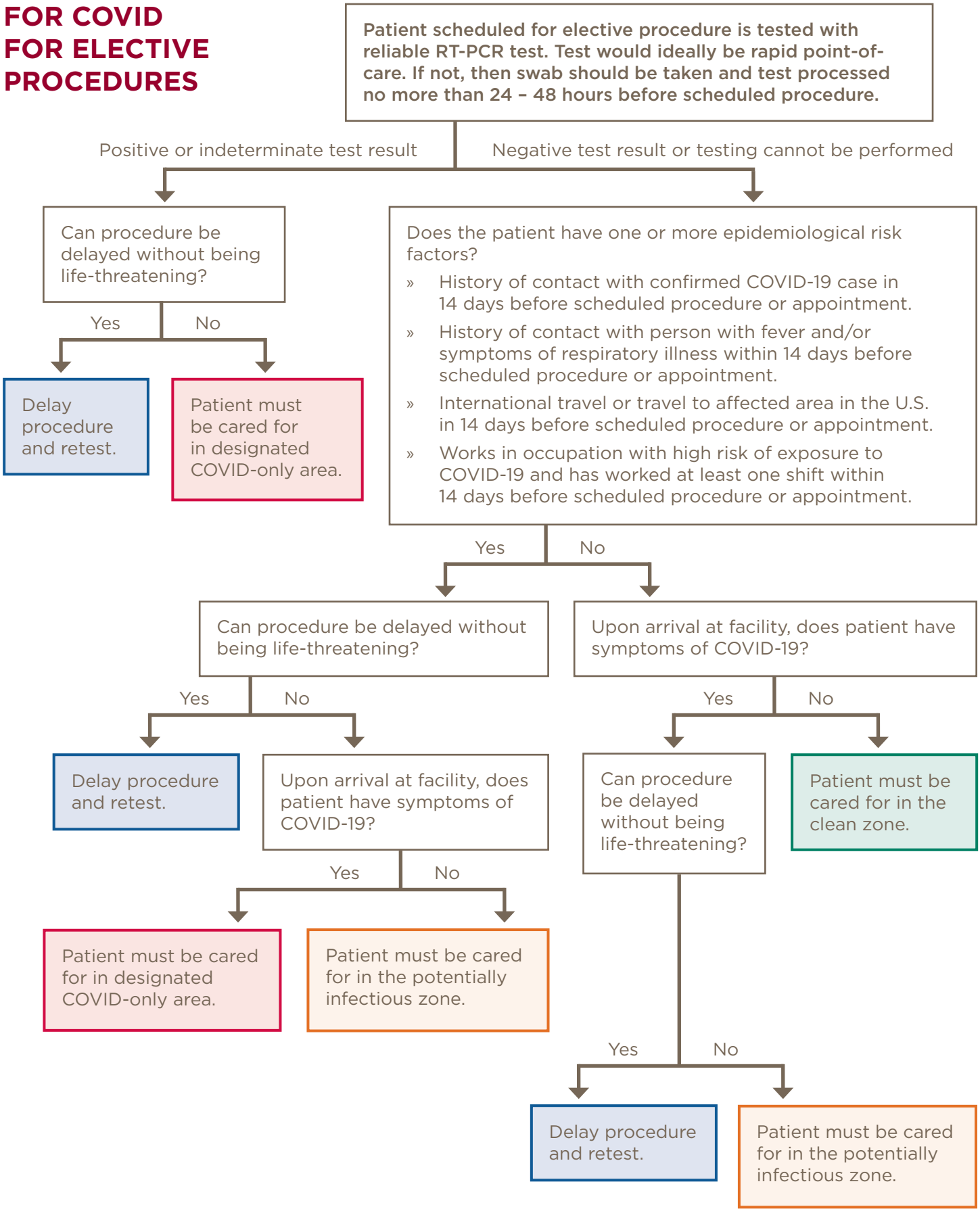
- International travel or travel to affected area in the United States in 14 days before scheduled procedure or appointment.
- Works in occupation with high risk of exposure to COVID-19 and has worked at least one shift within 14 days before scheduled procedure or appointment.

» Source control education and training should be provided to all patients before and upon arrival at the facility. Source control procedures to reduce potential for transmission within the facility should include universal masking (all patients and staff wear surgical masks at all times, except when a higher level of PPE is needed), thorough education and enforcement regarding hand hygiene and cough etiquette for patients and staff.

» Facilities should continue to implement measure to limit introduction of the virus to the facility, including:

- Limit/restrict visitors to reduce chances of introduction of the virus to the facility.
- Continue to postpone visits that do not negatively impact health of the patient, e.g., annual physical.

SCREENING PATIENTS FOR COVID FOR ELECTIVE PROCEDURES



UPON PATIENT ARRIVAL AT FACILITY FOR ELECTIVE PROCEDURE, SURGERY, OR OUTPATIENT VISIT »

» Facilities should implement engineering controls, including creating designated "zones," to prevent transmission of the virus within the facility.

› Implement measures and physical infrastructure changes to prevent transmission within waiting rooms, lobbies, and other areas where patients may congregate or otherwise have contact. These measures could include outdoor check-in areas, measures to control when patients approach the check-in area to limit contact between patients, etc.

› Entrance and exit should be carefully planned to reduce possibility of exposure or transmission.

› Establish three zones within the procedural area(s), using the "three zones, two passages" model that has been successfully implemented in China, Taiwan, and other locations to prevent transmission of virus within health care facilities.[2]

- Three zones: infectious zone, potentially infectious zone, and a clean zone — clearly demarcated. Two buffer zones between the contaminated zone and the potentially contaminated zone.
- Infectious zone/designated COVID areas: should include designated pre-op, OR, PACU, and other areas for COVID patients only. Negative pressure should be maintained in these areas. Staff should wear the highest level of PPE, including PAPRs and coveralls incorporating shoe and head coverings, and gloves. Recover patient in the OR if possible to limit chances of transmission.
- Potentially infectious zone: should include designated pre-op, OR, PACU, and other areas for potentially infectious patients only. Staff should wear the highest level of PPE, including PAPRs and coveralls incorporating shoe and head coverings, and gloves. Recover patient in the OR if possible to limit chances of transmission.
  - All intubations and extubations should be performed in negative pressure rooms.
- Clean zone: should include designated pre-op, OR, PACU, and other areas for patients who have been ruled out for COVID-19. Staff should utilize appropriate precautions.
- Passageway is established for the one-way transport of contaminated items, only in direct from clean» potentially contaminated» contaminated zones. Items may not be removed from the contaminated zone unless disinfected.
- Transport of patients and health care workers through the facility is tightly controlled to prevent transmission/contamination.

- Employers must ensure that nurses have access to the highest level of PPE.
  - For confirmed and possible COVID-19 patients, PPE should be of the highest standard: powered air-purifying respirators (PAPRs) and coveralls that incorporate head coverings and shoe coverings, and gloves.
- Employers should have a plan in place to limit exposures due to positive pressure OR environments. The plan should be written, created with direct care nurse and other health care worker input, and available to nurses and other health care workers to access. Such measures could include:
  - Using negative pressure ORs whenever possible.
  - Performing intubation in negative pressure environments at all times.
  - Limiting traffic in and out of the positive pressure OR to decrease air flow that may transport contamination into hallway.[3] [4]
  - Adding HEPA filters to the patient's end of the breathing circuit, between the expiratory limb of the circuit and the anesthetic machine.[5]
- Environmental cleaning.
  - Cleaning of ORs and procedure rooms after each case and at end of day — including high touch surfaces, equipment, etc.
  - Once a suspected or confirmed COVID-19 leaves, the room should remain vacant for enough time to allow a full exchange of the air. Time will vary depending on ventilation rate. If unknown, leave vacant for at least an hour.
  - Consistent and regular environmental cleaning and disinfection, including disinfecting of floors, walls, furniture, surfaces, objects, etc. at least three times per day. Should be conducted with cleaning chemicals that contain a disinfectant known to be effective against SARS-CoV-2.
  - Add air cleaning equipment to ventilation systems, such as UV cleaners, HEPA filter units, others.
- Occupational exposure prevention, surveillance, and response to prevent transmission to and by health care workers.
  - Opt-out process for RNs at higher risk of complications from COVID-19 such as older adults and people who have serious chronic medical conditions.
  - Accommodations for frontline staff working in facility, including provision of nutritious meals.
  - Ongoing monitoring of health of frontline staff. If develop fever or other symptoms of COVID-19, they should be isolated immediately and tested at employer's expense. Any RN who has worked in the facility within 14 days of developing symptoms and/or testing positive should have presumptive eligibility for workers' compensation.
  - Employer should provide temporary scrubs and facilities for staff to shower and change before going off duty.
  - No mandatory overtime. Breaks and relief should be provided.
- Employers should develop procedures to ensure safe handling of deceased patients with COVID-19.

THREE ZONE MODEL CONSIDERATIONS

	Infectious Zone/ COVID-designated Zone	Potentially Infectious Zone	Clean Zone/Non-COVID Zone
Areas	Designated pre-op, OR, PACU, IR, other procedure areas.	Designated pre-op, OR, PACU, IR, other procedure areas.	Designated pre-op, OR, PACU, IR, other procedure areas.
Ventilation Considerations	Negative pressure.	All intubations, extubations, and other aerosol-generating procedures should be performed in negative pressure rooms. Employer must implement written procedure to limit possibility of exposure/ transmission with use of positive pressure rooms.	All intubations, extubations, and other aerosol-generating procedures should be performed in negative pressure rooms. Employer must implement written procedure to limit possibility of exposure/transmission with use of positive pressure rooms.
PPE	Highest level of PPE, including PAPRs and coveralls incorporating shoe and head coverings, and gloves.	Highest level of PPE, including PAPRs and coveralls incorporating shoe and head coverings, and gloves.	Use precautions typical for care required by patient. If full screening described above is not implement, then highest level of PPE should be worn in this zone.

ENDNOTES

1 https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html.

2 Italy has also created standards to this effect https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7137852.

3 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4865048.

4 For example, some recommendations include having procedures that "All operators (i.e., surgeon, anesthetist, nurses, technicians) should enter the OR timely, aiming to minimize time spent within the OR itself. Once in the OR, they should not leave until the operation is completed, and once out they should not re-enter." https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7137852.

5 https://link.springer.com/article/10.1007/s12630-020-01620-9#Sec15.

ATTACHMENT 10

NNU Issue Brief:
Decontamination and the Battelle N95 System

WARNING » BATTELLE N95 DECONTAMINATION SYSTEM IS NOT SAFE AND MAY NOT WORK

National Nurses United (NNU), the largest labor union for registered nurses in the United States, has examined the available evidence and warns that decontaminating and reusing N95 filtering facepiece respirators is unsafe.

Given reports of shortages of personal protective equipment (PPE), many hospitals and other health care employers have turned to reusing N95 filtering facepiece respirators designed for one-time use, including implementing decontamination methods to reuse respirators multiple times. And many employers are implementing N95 decontamination processes as an ongoing normal practice. This is unacceptable.

NNU has evaluated the available evidence on decontamination methods and determined that **NO METHOD IS BOTH SAFE AND EFFECTIVE.** For an N95 decontamination method to be safe and effective, it must meet three criteria »

1. **It must effectively inactivate the pathogen.**
2. **It must not degrade the performance of the respirator including filtration, structural integrity, and face seal.**
3. **It must not introduce an additional hazard to the worker wearing the respirator.**

Battelle's Critical Care Decontamination System was the first N95 decontamination method to be issued an emergency use authorization by the U.S. Food and Drug Administration (FDA). The U.S. federal government has issued a $400 million contract to make Battelle's systems available across the country.[1]

Battelle's process uses vaporized hydrogen peroxide to "decontaminate" N95 respirators. Tens of thousands of N95s are placed inside a container and hydrogen peroxide is vaporized into the container. The N95s remain in the chamber for a period of time. They are then removed and returned to the originating health care facility.[2]

#ProtectNurses. All Our Lives Depend On It.

California Nurses Association | National Nurses Organizing Committee | National Nurses United

National Nurses United has reviewed documentation from Battelle and expresses the following concerns that Battelle's process has not been shown to be safe nor effective »

1. **Does Battelle inactivate SARS-CoV-2 as well as other pathogens of concern in health care?**
   - » Battelle provides insufficient evidence to fully answer this question.
     - › Battelle states that they have verified their process on SARS-CoV-2 but the tests they used are insufficient. They tested their method on small cut-outs of the N95 filter material. This means they did not test the efficacy of their method on the straps, nose clip, folds and seams, foam, and other parts of a whole N95.
     - › Battelle cites several additional studies to show the efficacy of their process on other pathogens, but many of these studies actually used a different method (STERIS) and may not be fully comparable to Battelle.
     - › While hydrogen peroxide likely kills SARS-CoV-2 under some conditions, it is not clear whether Battelle's method kills SARS-CoV-2 present in and on N95 respirators.
   - » We have several concerns about Battelle's methodology:
     - › Are hydrogen peroxide levels even throughout the chamber? Battelle put chemical indicators in 4 corners and 1 in center during their validation tests, according to their technical bulletin, but that may be insufficient given the size of these operations.
     - › Battelle's photos show inconsistent placement of the N95 respirators. Other studies have found the orientation of the N95s to be important to whether the hydrogen peroxide reaches all surfaces.[3] Battelle states that placement is not a factor, but does not seem to have evaluated this part of their process.
     - › How well does Battelle's method inactivate pathogens trapped within the N95 filter media? Battelle has not evaluated this.
2. **Does the decontamination method impact fit, filtration, structural integrity, performance of N95s?**
   - » Battelle has not evaluated the impact of their decontamination method on N95 respirators that have been previously used. They are currently experimenting on nurses and other health care workers without their consent.
     - › What is the impact of Battelle's method on an N95 that has been worn for several hours or several shifts? In their studies to show that their method was safe, Battelle tested only new and unused N95 respirators. This data does not reflect the ways that Battelle's method will be used in the real world.
     - › Each time a respirator is put on and taken off we know there is some degradation. Straps, nose clips, and other parts can fail with repeatedly putting on and taking off an N95. Decontamination may degrade already-used N95s to the point that they no longer provide protection.
     - › Battelle states that they are currently gathering real-world information. It is concerning to us that this data was not gathered before Battelle started selling their system. This means, in effect, that Battelle is experimenting on health care workers without their consent.

- Battelle's process may degrade N95 filtration, fit, and performance.
  - Battelle maintains that their process does not degrade the N95 for up to 20 decontamination cycles. However, other studies have used methods similar to Battelle's and found that N95 performance is impacted after two or three cycles.[4]
  - Battelle uses a physical and visual inspection to determine whether respirators are impacted by the decontamination process. But you cannot tell just by looking if the N95 filter or fit has been degraded. This is like if a car mechanic just looked at the outside of your car and said it looks fine.
  - N95 models vary in structure, material composition, characteristics, etc. Data from tests on specific N95 models may not apply to other models. So far, Battelle has only tested a few dozen models.
  - Battelle's own research showed degradation of N95s after decontamination:
    - One model's elastic straps were elongated and degraded (textured surface).
    - Another model had a char-like odor after decontamination.
    - A third had a hard, brown spot that appeared after decontamination. Battelle did not investigate and deemed this N95 good-to-go.
    - Other models had bad fit testing results and wearers reported feeling air leakage around the nose (which means the N95 didn't seal fully to the wearer's face and therefore should not have passed a fit test).
  - The methods that Battelle uses to test the filtration of N95 respirators after decontamination do not measure whether the N95 respirators filter very small particles in the size range of viruses (less than 100-150 nanometers).

3. **Does wearing a decontaminated N95 pose a risk to the wearer?**
   - Yes.
   - Hydrogen peroxide vapor is toxic and highly dangerous to breathe in.[5] It is a colorless and odorless gas, which means that traces of off-gassing may not be detected by the wearer, making it difficult to protect themselves.
   - The U.S. Agency for Toxic Substances & Disease Registry (ATSDR) states for hydrogen peroxide: "Detection of odor does not provide adequate warning of hazardous concentrations."[6]
   - Hydrogen peroxide residue on and in the N95 respirator may pose respiratory and skin hazards.
   - Can hydrogen peroxide be trapped between layers of the N95? And can this result in off-gassing later? Battelle states that they conduct some tests during the decontamination process to ensure that off-gassing does not occur. But health care workers report headaches, odor sensitivity, and other symptoms when wearing decontaminated N95s.
   - Symptoms of hydrogen peroxide exposure include »
     - Headache, dizziness, nausea.
     - Airway irritation.
     - Hoarseness and shortness of breath.
     - Sensation of burning or tightness in the chest.
     - Skin irritation and burns.

Instead of turning to dangerous decontamination and reuse practices, employers should be providing nurses and other health care workers the safe workplaces they deserve.

Employers are legally and morally obligated to provide a safe and healthful workplace to employees. To prevent exposure to and transmission of COVID-19, health care employers must implement comprehensive precautions, based on the precautionary principle that states that we do not wait for scientific proof of harm before taking action to protect people's health.

- Health care employers must implement engineering controls, including prompt screening and isolation procedures, designated COVID-19 units, and converting rooms, units, floors, or entire facilities to negative pressure, where possible. See NNU's model standards for hospitals for more information: https://bit.ly/NNU-COVID19-SurgeStandards.
- PPE should be of the highest standard, based on the precautionary principle, and should include a powered air-purifying respirator (PAPR) and coveralls that include both head and shoe covering, and gloves.
- Under no circumstances, should nurses and other health care workers be provided less than a minimum of N95 filtering face piece respiratory protection when caring for patients with suspected or confirmed COVID-19, in addition to other necessary PPE.

Where N95 respirators are truly not available, employers should turn to PPE designed to be reusable and decontaminated safely, including powered air-purifying respirators (PAPRs) and elastomeric respirators.[7]

ENDNOTES

1 https://www.battelle.org/newsroom/news-details/battelle-lands-400m-federal-contract-to-decontaminate-n95-masks-for-hospitals-in-more-cities

2 https://www.battelle.org/inb/battelle-critical-care-decontamination-system-for-covid19

3 Duke University https://www.safety.duke.edu/sites/default/files/N-95_VHP-Decon-Re-Use.pdf

4 Fischer et al. reported testing a vaporized hydrogen peroxide method at approx. 1000 ppm for 7 min and found that N95 fit factor was unacceptably impacted after 3 decontamination cycles. Battelle's process operates at 750-1000 ppm for 2.5 hours. Fischer, Robert et al. " Assessment of N95 respirator decontamination and re-use for SARS-CoV-2," *medRxiv*, April 24, 2020, https://www.medrxiv.org/content/10.1101/2020.04.11.20062018v2

5 https://www.atsdr.cdc.gov/mmg/mmg.asp?id=304&tid=55

6 https://www.atsdr.cdc.gov/mmg/mmg.asp?id=304&tid=55

7 The U.S. Occupational Safety and Health Administration wrote in their guidance document that "when disposable N95 filtering facepiece respirators are not available, consider using other respirators that provide greater protection and improve worker comfort," including "a R/P95, N/R/P99, or N/R/P100 filtering facepiece respirator; an air-purifying elastomeric (e.g., half-face or full-face) respirator with appropriate filters or cartridges; powered air purifying respirator (PAPR) with high-effciency particulate resistance (HEPA) filter; or supplied air respirator (SAR)." U.S. Occupational Safety and Health Administration (2020), "Guidance on Preparing Workplaces for COVID-19," online at https:// www.osha.gov/Publications/OSHA3990.pdf

ATTACHMENT 11

NNU Issue Brief:
Antibody testing for SARS-CoV-2/COVID-19

April 20, 2020

Issue Brief » Antibody Testing for SARS-CoV-2/COVID-19

SUMMARY » The SARS-CoV-2 global pandemic has had far reaching implications for people across the globe. In the United States, this outbreak has exposed widespread failures in the ability of our nation to respond to a major infectious disease threat. The spread of SARS-CoV-2 has been exacerbated by long-term dysfunction not only our health care system but also our social safety nets. Trillions of dollars have been spent in attempts to sustain corporate profits and stock market values. With so many out of work and business revenues stalled there is an aggressive push to "reopen the country". Steps taken towards this goal must be guided by scientific evidence and prioritize protecting public health. The national and international discourse has turned to wide-spread antibody testing as a possible pathway to ending social distancing measures. Frontline health care workers are slated to be among the first to be tested. It is paramount that any steps taken are carefully weighed against the potential far-reaching consequences. For those who may be expected to enter the workforce, premature reliance on serology testing could have deadly consequences and undermine efforts to control the spread of infection.

BACKGROUND

The novel coronavirus, SARS-CoV-2, was identified in December 2019 as the cause of an outbreak of viral pneumonia. The virus spread rapidly around the world and a global pandemic was declared on March 11, 2020. The response has varied widely between countries and, within the United States, between states. While some countries have successfully prevented wide-spread outbreaks, the United States now has the most cases and deaths.[1]

The United States' response to SARS-CoV-2 has been inadequate in many ways. Testing has been largely unavailable, contributing to delays in surveillance, diagnosis, and isolation. Wide-spread shortages and rationing of personal protective equipment (PPE) have led to high rates of infection in health care workers and other essential workers. Many but not all states have issued stay-at-home orders, an essential step in preventing transmission. Delays in implementing social distancing policies by some models may have increased the death toll during this first-wave of infection by up to 60 percent.[2] Trillions of dollars have been funneled into Wall Street while millions of unemployed have yet to receive any relief. The United States' response to SARS-CoV-2 has failed and continues to fail by any number of measures.

In contrast, other nations were prepared for the SARS-CoV-2 virus. Several countries acted with a robust and coordinated response that adeptly contained the spread of infection and are now seeing rapid declines in new cases.[3]

Objectively, the inability to produce and implement widespread diagnostic testing has created one of the biggest obstacles to a successful response in the United States. With SARS-CoV-2 now wide-spread throughout the United States, limited availability of diagnostic tests, and high rates of false negative test results the window for actively surveilling how many people have been infected with SARS-CoV-2 has largely passed in the first wave of infections. This situation creates several challenges in the ability to move forward. It is essential that eagerness to move forward does not once more ignore basic scientific principles.

This issue brief explores the current narrative on plans to "reopen the economy," which largely focus on using antibody testing.

POLICY MAKERS FOCUS ON ANTIBODY TESTING AS KEY ELEMENT IN PLANS TO "REOPEN THE ECONOMY."

Recently, much of the discussion has turned to how stay-at-home orders will be lifted and businesses reopened. This discussion relies heavily on widespread antibody testing. Antibody testing measures antibodies that may be produced in response to pathogens, which is part of the immune response to the virus. These antibody tests are distinct from the RT-PCR tests used so far that measure viral particles and determine active infection only. There are different types of antibodies that emerge at different points in an infection and play different roles in the immune response.[4] The immune system is complicated and not fully understood. This is especially true for SARS-CoV-2.

Important points to know:

- Antibody testing is not the same as establishing immunity.
- It may be years before we understand immunity to the novel pathogen, SARS-CoV-2.
- We are already seeing misuse of the terms. Policy makers are acting as though antibody testing and establishing immunity are interchangeable.

For example, Governor Newsom of California said in his April 6 briefing that antibody testing will be "foundational, fundamental" to sending Californians back to work.[5] Governor Cuomo of New York and others have made comments along these same lines.[6]

Along with antibody testing, policy makers are discussing rolling out "immunity documentation," including immunity certificates, passports, or cards. Under these proposals, people would be required to carry with them "immunity documentation" to prove their antibody test status. Dr. Fauci, director of the National Institute of Allergy and Infectious Diseases and member of the White House Coronavirus Task Force, recently discussed antibody testing on CNN:

> "Within a period of a week or so, we are going to have a rather large number of tests that are available," Dr. Anthony S. Fauci, the leading infectious disease expert in the U.S., said Friday morning on CNN. He said the White House coronavirus task force was discussing the idea of "certificates of immunity," which could be issued to people who had previously been infected. "As we get to the point of considering opening the country," Dr. Fauci said, "it is very important to understand how much that virus has penetrated society." Immunity certificates, he said, had "some merit under certain circumstances."[7]

Similar programs have been proposed in Italy, the United Kingdom, Germany, and other countries.[8] [9] [10]

These decisions are being made on a very short timeframe and with inadequate information. The ways that antibody testing is being discussed raise several serious concerns that are outlined in this issue brief.

1. A positive antibody test does not mean someone is immune. There is still a lot we do not yet know about how SARS-CoV-2 impacts the immune system.

Knowledge about SARS-CoV-2 is growing but there is insufficient information available especially regarding the immune response to this virus. The virus was identified in December 2019 and has only been studied for four months. There is, therefore, no information available on long-term immune response or immunity.

There are some questions that must be asked about this virus before antibody testing is used to inform policies that relax physical distancing protections:

- **How long do symptoms last?**
  Information is still being gathered.[11]
- **How long can someone be infectious?**
  People with SARS-CoV-2 can be infectious without symptoms, before symptoms manifest, and possibly for several days to several weeks following recovery.[12] [13] [14]
- **Does having antibodies mean someone is not infectious?**
  No, having antibodies does not mean someone is no longer infectious for SARS-CoV-2.[15] [16] [17]
- **Does having antibodies mean someone is immune?**
  A positive antibody test does not necessarily mean a person is immune to SARS-CoV-2.[18] [19] [20]
- **Once someone has recovered from a SARS-CoV-2 infection, can they get it again?**
  There are multiple reports of people testing positive after recovery and negative tests for SARS-CoV-2. We do not yet know if this is due to re-infection or recurrence of prior infection.[21] [22] [23] [24] [25]

2. Oversight of antibody tests is lacking. Test results may not be reliable.

Unlike RT-PCR tests, the U.S. Food and Drug Administration (FDA) does not require review and approval for new SARS-CoV-2 serological tests, including tests for antibodies.[26] This lack of oversight means that it is unclear how reliable the tests are. Tests may produce high numbers of false negatives or high numbers of false positives. Some tests are not specific to SARS-CoV-2 and may measure antibodies to any coronavirus, including those that cause the common cold.

Companies conducting the test are supposed to include a statement with the results with some disclaimers, but enforcement of this minimal requirement is unclear and there are reports that it is not happening: "Promotional emails sent to hospitals and reviewed by *The Associated Press* failed to include required disclaimers. Some kits sold on websites promote themselves as 'FDA-approved' for home testing. The agency has not yet approved any COVID-19 home test."[27]

The CEO of the Association of Public Health Laboratories, Scott Becker, told CNN that his labs would not use the antibody tests on the market due to concerns about inaccurate results and lack of FDA oversight. "It could be quite dangerous," he said.[28]

Further, the type of antibody that the test measures matters. Different antibodies show up at different points in an infection.[29] Not all tests measure the same antibodies and most tests do not measure everything. Some tests are not even specific to SARS-CoV-2 and instead measure antibodies for any coronavirus, including those that cause the common cold.

In short, antibody tests may not even effectively measure antibodies for SARS-CoV-2.

3. Misuse of antibody tests may have dangerous ramifications for containing spread of SARS-CoV-2.

Equating a positive antibody test result with immunity is an irresponsible and unscientific way to use antibody tests given current scientific knowledge. However, in the push to reopen businesses and release stay-at-home orders, many policymakers continue to make this assumption. Using antibody tests to indicate immunity status may lead to unsafely returning workers to work because they are considered "immune":

- Could lead to exposure to workers who are not immune, which will result in further spread of the virus.
- Could lead to exposure to others from workers who are still infectious. Testing for antibodies in the first ten days or so of infection will not identify that the worker has an active infection and is infectious. Antibody testing to determine return-to-work would not identify asymptomatic or pre-symptomatic infections.

And yet, some testing manufacturers make broad claims about antibody test results. For example, one lab tailors materials to "Employers who would like to see what portion of their workforce is potentially immune/non-infectious."[30] It is worth noting that this lab also states, "Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E."

4. Targeting health care workers for antibody testing raises ethical concerns. Health care employers must not use antibody testing to remove or downgrade protections for nurses and other health care workers.

Many reported plans to roll out and study antibody testing have singled out health care workers as priority:

- The director of the CDC, Robert Redfield, indicated in an interview with media that antibody tests could be used by hospitals to select and place health care workers during a second wave of COVID-19 patients expected later this year.[31]
- Codirector of the clinical lab at a large hospital in San Francisco stated: "If a health care worker has the antibodies, then they would be at [a decreased] risk of acquiring the virus, so they could potentially be more on the frontline of fighting this and helping those that are infected acutely."[32]
- The Chief Medical Officer of a laboratory company, which is performing testing for a health care system and university in Utah, stated, "At this point, I think the target is health care workers who have been exposed perhaps to the disease...To try to determine if they have become infected with the virus and likely developed immunity in case they have not presented symptoms. That will allow us to identify individuals who have developed immunity against the infection, who could potentially go back to work."[33]
- A large health care system in Michigan is also focusing on health care workers in rolling out antibody testing.[34]
- Large health care systems in Minnesota also reported making plans to use antibody tests for statewide surveillance and starting using them with health care workers.[35]

This trend echoes what we have seen in other countries using and proposing wider antibody testing. Health care workers in Italy were the first to be tested for antibodies.[36] United Kingdom had proposed a similar program to roll out antibody testing for health care workers first, but have since announced that none of the 17.5 million antibody tests purchased work well enough to be used.[37] [38]

Lacking and inadequate personal protective equipment (PPE) has been a significant and ongoing issue that jeopardizes the health and safety of nurses, their patients, colleagues, and families, and ultimately our communities. Throughout the pandemic, nurses and other health care workers have identified a clear pattern where their employers move to the lowest possible standard of protection.

Hospitals and other health care employers may use a positive antibody test result, equated inappropriately with immunity, to rationalize removing or downgrading protections for nurses and other health care workers. This is unacceptable.

There is, in fact, a history of employers using presumed immunity to excuse removing protections. During the 2014-15 Ebola outbreak in West Africa, survivors who had recovered from Ebola were sent into Ebola Treatment Centers, without full PPE, to provide care to patients with Ebola (see photo where a survivor with no PPE works alongside a worker with full PPE).[39] [40] Even with Ebola, recovering from an infection does not guarantee immunity.[41]

The targeting of health care workers in these studies to learn more about immunity and antibody testing raises serious ethical concerns. The lack of protective PPE plus concerted targeting of antibody testing essentially amounts to a widescale experiment being conducted on nurses and other health care workers without their consent.

5. The use of any form of "immunity documentation" to determine return-to-work or lifting of stay-at-home orders would further deepen racial and economic disparities in the United States.

The use of "immunity documentation," including immunity certificates, passports, cards, etc., has been proposed in other countries and is being discussed in the United States as a way to reopen the economy faster. "Immunity documentation" policies rely on the inappropriate assumption that a positive antibody test means immunity for SARS-CoV-2; this is a novel virus and currently insufficient scientific knowledge exists to support this assumption.

Antibody testing is likely to follow the same patterns that we have seen with RT-PCR testing, which has been fraught with issues since the beginning:

- First, the CDC's testing was extremely limited, then it was faulty.[42]
- Testing and testing materials have been of short supply and private companies have overpromised testing capacity and many states have seen tens of thousands of tests pending results for weeks.[43] [44]
- With the limited supply of PCR tests, we have seen celebrities and government officials have easy access to testing while frontline health care workers and many patients have been denied tests.[45]

Further, testing has not been equitably available across the United States:

- In some places like Shelby County, Tennessee, RT-PCR testing has been available in white neighborhoods but not in black neighborhoods.[46]
- Philadelphia and other places across the United States have shown similar disparities in where testing has been made available, where suburban drive through testing centers have been set up and urban centers neglected.[47]
- African-Americans have been less likely to be referred for testing when they show up for care with signs of infection, which is part of a larger and long-standing pattern where Black and Indigenous People of Color are less likely to get needed care and more likely to have worse outcomes.[48]
- According to the U.S. Department of Health and Human Services, non-hispanic blacks are less likely to have health insurance and more likely to be uninsured than non-hispanic whites, which may additionally impact access to testing for SARS-CoV-2.[49]

With use of "immunity documentation," disparities in who has access to antibody testing may result in a disparities in who is allowed to return to work.

Increasing unemployment related to COVID-19 has been unequal. According to the U.S. Bureau of Labor Statistic, unemployment rates rose 6.7 percent for Blacks, 6.0 percent for Hispanics, and 4.0 percent for whites in March 2020 alone.[50] The stark racial disparities in COVID-19-related unemployment mean that testing disparities would further amplify economic disparities.

Even if employers were to offer or require antibody testing directly to employees, there would continue to be disparities in exposure, infections, and deaths.

- We do not know that a positive antibody test means that a worker is immune.
- We can expect that certain jobs will be pressured to use "immunity documentation" sooner, including health care, grocery workers, other food service workers, retail workers, and manufacturing workers.
- There are already stark disparities in who can work from home: 30 percent of white workers can telework compared to 20 percent of Black or African American workers.[51]
- Significant disparities in household wealth, with the median Black family owning just 2 percent of the wealth the median white family owns, mean there will be unequal pressure on Black workers to return to work sooner.[52]
- The use of "immunity documentation" will likely continue to mean increased exposure, infections, and deaths among these workers.

These disparate impacts on Black workers as compared to white workers with the use of "immunity documentation" would likely further amplify health disparities of COVID-19. The CDC recently reported data that showed that black populations are disproportionately affected by COVID-19. While 59 percent of the catchment population is white, 18 percent is Black, and 14 percent Hispanic, 45 percent of COVID-19 hospitalizations were White, 33 percent Black, and 8 percent Hispanic.[53] Several states have now started reporting data on COVID-19 deaths and race and Black patients are dying at higher rates than others from COVID-19.[54] These racial disparities in COVID-19 hospitalizations and deaths reflect long-standing health disparities where Black populations experience higher rates of diabetes, asthma, kidney disease, heart disease, lung disease, and other co-morbidities associated with increased severity of COVID-19, caused by racism, economic disparities, housing disparity, environmental pollution, and other causes of inequality.

CONCLUSION

In conclusion, antibody testing requires further analysis and discussion.

Before antibody testing is used to determine any policy, more investigation is needed to better understand the interactions between SARS-CoV-2 and the immune system, reliability of antibody tests, and other elements related to SARS-CoV-2.

Based on what we do currently know, nurses know the following measures must be put in place to better manage the SARS-CoV-2 pandemic and prevent further transmission:

- Workplace protections for nurses and other health care workers, with the highest level of protection as determined by the precautionary principle.
- Congress and the Trump Administration to invoke the Defense Production Act to mobilize a much broader and bigger manufacturing push to produce the N95s and other gear we need now and in the long term.
- Widespread RT-PCR testing of both asymptomatic and symptomatic individuals to ensure prompt recognition and response to all possible COVID-19 infections.
- Rigorous contact tracing to identify all people who may have been exposed to a confirmed case, ensuring that those individuals are isolated, and that further transmission is stopped.
- Coverage of all treatment, care and services for people with potential COVID-19 infection who are uninsured or underinsured, including for insured patients who are denied coverage. This should include funding for widespread communication to the public that all testing, treatment, and other health care services related to COVID-19 will be paid for regardless of their insurance status.

ENDNOTES

1 World Health Organization. "COVID-19 Dashboard," online at https://who.sprinklr.com/, accessed April 13, 2020.

2 Jewell, B. and Jewell, N., "Opinion | The Huge Cost of Waiting to Contain the Pandemic." *The New York Times*, April 14, 2020, online at https://www.nytimes.com/2020/04/14/opinion/covid-social-distancing.html.

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ATTACHMENT 12

NNU Frequently Asked Questions on Reuse and Extended Use of N95s

FAQ on Reuse of N95 Respirators

1. Mask vs respirator

A mask — including both a surgical mask and a cloth mask — does not provide respiratory protection to the wearer. It may be useful for source control as surgical masks are intended to protect others from the wearer's respiratory droplet emissions. Unlike respirators, surgical masks are not required to be fit tested, which allows leakage around the edge of the mask. They are also not subjected to rigorous NIOSH filter certification, which measures the filter efficiency of each respirator from very small airborne particles.

A respirator is specifically designed to provide respiratory protection for the wearer by filtering out airborne contaminants. There are various types of respirators, most of which form a tight seal around the face. Respirators vary in their level of protection and filter efficiency. Elastomeric and powered air-purifying respirators (PAPR), for instance, provide higher levels of respiratory, eye and face protection from infectious particles than N95 filtering facepiece respirators. N95 filtering facepiece respirators filter out at least 95% of the small particles that are most likely to go deep into the lungs.

N95 filtering facepiece respirator

Surgical mask — note how loosely the mask fits to the person's face

2. Reuse vs extended use — is there a difference?

Reuse refers to the practice of repeated donning and doffing of the same respirator. This means the same respirator is used for multiple patient encounters, removing it between each of those encounters.

Extended use refers to the practice of wearing the same respirator for multiple patient encounters without removing it in between. This means a nurse puts on an N95 and doesn't take it off until sometime later, even though they may be seeing different patients or going in and out of a patient's room multiple times.

3. What does it mean for an N95 to be decontaminated?

Decontamination of disposable, single-use N95 respirators means the employer collects used N95s and sends them to a contractor to remove contaminants that have accumulated on the respirators. CDC/NIOSH recognizes in their new guidance that there is insufficient evidence to show that any decontamination method is both safe and effective against SARS-CoV-2. Based on NNU's evaluation of the available scientific evidence, there is no method that is shown to be safe and effective.[1]

4. But employers say they must implement these extended use, reuse, and decontamination policies because there aren't enough N95s. A decontaminated N95 is better than a bandana, right?

There is no validated, scientific evidence that multiple re-use or decontamination of N95s is safe and will adequately protect a health care worker from exposure to SARS-CoV-2 and other pathogens. Extended use and reuse of disposable N95s can increase the risk of exposure and transmission to others. The frequent donning and doffing of N95s may greatly increase cross contamination of various pathogens in addition to SARS-CoV-2, especially when nurses and other health care workers are fatigued and exhausted from each shift.

Instead of racing to the lowest standard possible, employers should provide other types of respirators that have equivalent or higher levels of protection, such as elastomerics, PAPRs, industrial N95s, other kinds of filtering facepiece respirators (N/P/R-100, etc.), and comparable respirators from other countries (KN95s, FFP2/3).

5. Doesn't the FDA approval of Battelle's hydrogen peroxide system mean it's safe?

No, FDA's approval of Battelle's hydrogen peroxide system is insufficient to prove it's safe. The FDA's Emergency Use Authorization letter states that Battelle's system "may be effective at preventing exposure to pathogenic airborne particulates," without adequately demonstrating how effective it is in decontaminating SARS-CoV-2 specifically. The risk and benefit analysis used as justification for this authorization compared decontaminated N95s to a scenario where no respiratory protection was used (such as wearing bandanas). The FDA does not provide any evidence beyond this comparison. What the FDA's approval of Battelle's system means is that a decontaminated N95 may only offer protection equal to a bandana. Nurses and health care workers who will reuse these decontaminated N95s must be adequately informed of the potential risks including failure of fit and filtration efficiency, and reduction in breathability, as mandated by the FDA.

Report Adverse events MedWatch by submitting the online FDA Form 3500 (https://www.accessdata.fda.gov/scripts/medwatch/index.cfm?action=reporting.home) or by calling 1-800-FDA-1088.

6. What does OSHA require?

Federal OSHA recently announced that employers may consider reuse of N95 respirators if alternative NIOSH-approved respirators are not available. Employers will not be cited for violating respiratory protection standards so long as they adhere to CDC guidance. This deference is irresponsible and fails to protect nurses and other health care workers from COVID-19.

Cal/OSHA has not released any statement or guidance on reuse of N95 respirators.

7. The employer says that there is evidence to show that their decontamination method is safe and effective. They quote this study from Stanford

The study from Stanford did not test all aspects needed to determine that dry heat and hot water vapor are both safe and effective methods of decontamination for N95s.

What the study did: Researchers from Stanford University recently tested decontaminating N95 respirators using dry heat from an oven as well as hot water vapor from boiling water.

What the study found: Both methods tested were effective for decontamination of E coli and did not affect respirator integrity. This study does not prove the ability of these methods to decontaminate SARS-CoV-2. SARS-CoV-2 and other pathogens may survive if temperature, humidity, or duration is too low.

Other important info: The use of microwaves and ovens is not recommended as studies have also found that they can melt materials on respirators including straps.[2] [3] Further, other studies show that repeated thermal cycles may damage respirator fit and filtration, rendering them less effective.[4] [5]

8. The employer says that there is evidence to show that their decontamination method is safe and effective. They quote this study from Duke

The study from Duke University did not test all aspects needed to determine that hydrogen peroxide vapor is both a safe and effective method of decontamination for N95s.

What the study did: Duke University recently studied a decontamination method for N95s that uses hydrogen peroxide vapor.

What the study found: This study did not prove the ability of the method to decontaminate SARS-CoV-2. This method also did not evaluate whether this method decontaminates the layers within the N95 filter medium. The authors of the study claim that their method eliminates off-gassing hazards to the wearer with sufficient aeration.

Hydrogen peroxide vapor has little to no odor, which means that traces of off-gassing may not be detected by the wearer, making it difficult to protect themselves. Breathing in hydrogen peroxide can cause upper airway irritation, shortness of breath, and chest tightness. Exposure to high concentrations can cause severe mucosal congestion of the trachea and bronchi and delayed accumulation of fluid in the lungs. Prolonged dermal exposure from any chemical residue can also cause irritation and temporary bleaching of skin and hair.

Other important info: Nurses and other health care workers whose employers use this decontamination method should be informed of the potential risks, including the lack of evidence for safety and efficacy of decontamination. Employers should also immediately medically monitor their staff and implement a reporting system for health care workers to report symptoms of respiratory illness, skin irritation and cancer.

9. What about this website that was created by a group of scientists — www.N95decon.org?

A group of scientists from institutions including the University of California, Berkeley; University of California, San Francisco; University of Chicago; Stanford; Georgetown University; Harvard University; Seattle University; University of Utah; Massachusetts Institute of Technology; and University of Michigan; and from Consolidated Sterilizers and X, the Moonshot Factory got together supposedly to research methods to decontaminate and reuse respirators.

The results of their investigation and review of available studies also determined that there is no safe and effective method to decontaminate and reuse respirators.

Nevertheless, they make recommendations on "promising methods" that might be used to decontaminate and reuse respirators and provide fact sheets on the most promising methods. Notably, they warn "Efficacy and safety has not been fully characterized."

10. Do homemade masks provide protection?

No, homemade cloth masks do not provide respiratory protection. Unlike N95 filtering facepiece respirators used in health care settings, cloth masks have neither the particle filtration mechanism nor the airtight face seal design to filter at least 95% of infectious particles, and protect against droplet spread, splashes and other body fluids. One study reported that cloth or homemade masks provided little to no protection for respiratory illnesses due to poor filtration and pathogen retention.[6]

Wearing masks can be an important part of source control because a mask can reduce the respiratory droplets emitted by the wearer. However, according to one study, surgical masks were three times more effective at reducing respiratory droplets emitted by the wearer than homemade cloth masks.[7]

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ATTACHMENT 13

NNU Frequently Asked Questions on COVID-19 (Last Update: May 26, 2020)

Updated May 26, 2020

Frequently Asked Questions on COVID-19

E. Environmental Cleaning 28

A. General Background on COVID-19

1. What is the precautionary principle?

Here are two versions of the precautionary principle:

> *Lacking scientific consensus that a proposed action, policy, or act is not harmful—particularly if that harm has the potential to be catastrophic—such action, policy, or act should not be implemented and the maximum safeguards should be pursued.*
>
> *We cannot wait until we know for certain that something is harmful before action is taken to protect people's health.*

We have very little scientific research about COVID-19. Per the CDC: "COVID-19 is a new disease and we are still learning how it spreads, the severity of illness it causes, and to what extent it may spread in the United States."[1]

Example: Based on the precautionary principle, a government agency should require a health care provider who has been exposed to a patient with probable or confirmed COVID-19 to be put on paid medical leave for 14 days to protect others from being infected.

Example: Based on the precautionary principle, a government agency should require that health care workers in proximity to a patient with probable or confirmed COVID-19 be provided with optimal personal protective equipment.[2]

2. What is COVID-19?

COVID-19 is the infectious disease caused by the most recently discovered coronavirus, known as SARS-CoV-2. The new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019. SARS-CoV-2 is a coronavirus. Coronaviruses are a large family of viruses that can infect animals and/or humans. SARS-CoV-2 is similar to the viruses that cause SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome).

3. What are symptoms of COVID-19?

Some common symptoms reported are fever, cough, achiness, fatigue, shortness of breath, sore throat, chills, and sudden loss of taste or smell. However, we have limited knowledge about the true breadth of symptoms because we do not yet have extensive, systematic community sampling and testing for COVID-19. Most of the scientific literature presents information on hospitalized cases, which will only tell us symptoms of people who have progressed to more moderate or severe disease.

What is known: Several published reports have established a basic picture of clinical symptoms and outcomes for those infected with COVID-19. These symptoms can include fever, cough, muscle soreness, weakness, diarrhea, headache, and other symptoms. While some symptoms appear to be common, there is also diversity in how COVID-19 manifests across different populations.

Several additional reports underline the potential seriousness of a COVID-19 infection, including damage to lung tissue that has become characteristic to COVID-19. Shi et al. (Feb 24, 2020) describe this damage:

> "COVID-19 pneumonia manifests with chest CT imaging abnormalities, even in asymptomatic patients, with rapid evolution from focal unilateral to diffuse bilateral ground-glass opacities that progressed or co-existed with consolidations within 1-3 weeks."[3]

1 https://www.cdc.gov/coronavirus/2019-ncov/about/transmission.html, accessed March 8, 2020.

2 See "Selection of Protective PPE for Nurses and Other Health Care Workers Caring for Patients with COVID-19" for information on recommended PPE. Available here: https://www.nationalnursesunited.org/sites/default/files/nnu/files/pdf/flyers/0220_NNU_HealthSafety_COVID-19_PPE_Report.pdf.

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Blood clots and strokes have also been associated with COVID-19. Five patients under 50 years of age without risk factors were diagnosed with SARS-CoV-2 infection and large-vessel strokes.[4] Abnormal blood clotting was recently identified at autopsy of 12 patients who died of COVID-19 in Germany.[5] Other clinical manifestations of COVID-19 can also include:[6]

- Inability to wake or stay awake
- New confusion
- Bluish lips or face
- Encephalopathy
- Acute hypoxemic respiratory failure
- Multiple organ dysfunction syndrome
- Sepsis and septic shock
- Delirium

4. What can happen when someone gets COVID-19? (symptoms and clinical outcomes)

We are still learning new things daily about the pathophysiology, epidemiology and clinical manifestations of COVID-19. There is a very wide range of outcomes for people who have been exposed and infected with the SARS-CoV-2 virus: many people will never develop any overt symptoms of infection or have very mild symptoms, while a significant proportion of people may develop severe or deadly infection. Because this is a novel virus, no one has pre-existing immunity or resistance to infection and we do not yet have any vaccines against it. Due to its transmission dynamics it is very efficient at spreading from person to person (see question 7).

When someone is exposed to the SARS-CoV-2 virus, the virus finds a receptor and enters cells, rapidly replicating and infecting various cells, tissues and organs throughout the body. SARS-CoV-2 virus can bind to angiotensin-converting enzyme-2 (ACE2) receptors, which are prominently found in the lungs, kidneys, heart, GI tract, and even in the nose. As the virus binds to receptors and is brought into the body, the immune system activates to fight the virus. The virus can cause direct injury to tissues of the body, but it appears that the most severe outcomes may stem from the body's extensive and at times hyperreactive inflammatory response to the infection.

COVID-19 has a wide variety of presentations ranging from asymptomatic infection to life-threatening respiratory failure and multi-organ dysfunction. If someone develops symptoms, they on average usually appear 4–5 days after exposure. Most experts have reported the incubation period as a range of 1–14 days, though some reports have indicated it may take a few hours up to 3 weeks for an infection to develop in some individuals. Based on current data, symptoms are mild in approximately 80% of cases, but for the approximately 20% of cases for whom they are not mild, they may rapidly progress to the need for oxygen support and develop a severe form of pneumonia, which may precipitate a cytokine release syndrome, acute respiratory distress syndrome (ARDS), and respiratory failure. In severe cases, infection may also precipitate sepsis, cardiac complications, multi-organ system failure, shock, secondary infections in the body, and death.

The discovery of COVID-19 and SARS-CoV-2 was prompted by reports of a cluster of newly discovered, novel, severe viral pneumonia. Pneumonia causing respiratory dysfunction or failure represents one of the most common and severe manifestations of infection with this virus. However, as more research has emerged, health care workers and providers are seeing that the virus may affect virtually every major organ system in the body and its impact is not just on the pulmonary system.

4 Oxley, Thomas J, et al. "Large-Vessel Stroke as a Presenting Feature of Covid-19 in the Young." *New England Journal of Medicine*, vol. 382, no. 20, 2020, doi:10.1056/nejmc2009787.

5 Wichmann D, Sperhake JP, Lütgehetmann M, et al. "Autopsy Findings and Venous Thromboembolism in Patients With COVID-19" [published online ahead of print, 2020 May 6]. *Ann Intern Med*. 2020;10.7326/M20-2003. doi:10.7326/M20-2003.

6 Troyer, Emily A, et al. "Are we facing a crashing wave of neuropsychiatric sequelae of COVID-19? Neuropsychiatric symptoms and potential immunologic mechanisms." *Brain, behavior, and immunity*, S0889-1591(20)30489-X. 13 Apr. 2020, doi:10.1016/j.bbi.2020.04.027

A major concern is that COVID-19 is a hypercoagulable state and there have been increasing reports documenting a high risk of venous thromboembolism (VTE) including microvascular thrombosis.

Other associated clinical issues include but are not limited to ARDS, acute renal injury or renal failure, myocardial infarction, myocardial inflammation, pulmonary emboli (PE), deep vein thromboses (DVTs), elevated liver function tests (LFTs) and liver injury, stroke (CVA), seizure, encephalitis, diarrhea, acute anosmia or ageusia, and conjunctivitis.

In contrast to severe infection, widespread cases of asymptomatic infections have also been reported from several countries including the United States.[7] Arons et al. found more than half of the residents in a skilled nursing facility in Washington state were asymptomatic at the time of testing, with high viral loads.[8] Prevalence of asymptomatic transmission was also found in a large homeless shelter in Boston. Of the 408 individuals tested, 147 (36%) tested positive for COVID-19 but showed no signs of symptoms.[9]

5. Isn't it just older adults and people with serious underlying disease who get COVID-19? Isn't it mild for everyone else?

No. Early in the pandemic, there was a common misunderstanding about the difference between risk of infection and risk of severe disease. Everyone is at risk for infection with COVID-19 disease. Some people, however, have a higher risk for experiencing severe or life-threatening disease. Adults over the age of 60 and people of any age who have a serious underlying medical condition may have a higher risk of severe disease. And, thus far in the pandemic, we have seen in the U.S. that Blacks, Latinx, and Native American populations experience a disproportionate risk of severe disease and death as well.

Examples of medical conditions that may increases one's risk for severe illness include chronic lung disease, diabetes, hypertension, heart disease, chronic kidney disease on dialysis, liver disease, severe obesity, and people who are immunocompromised due to cancer treatment, smoking, transplant recipients, immune deficiency, poorly controlled HIV or AIDS, prolonged corticosteroid use, or use of other immunosuppressive medications.

However, just because someone does not have an underlying risk factor for severe disease does NOT mean that they are safe or are assured of a mild illness. For example, data from CDC reports on March 16, 2020, indicated that 20% of hospitalized patients were 20–44 years old and 12% of ICU admissions were 20–44 year olds.[10] Otherwise healthy adults in their 20s, 30s, and 40s with none or few of the usual risk factors for stroke or clot have experienced large-vessel strokes and in some cases, death, as a result of the hypercoagulable state of COVID-19 infection.[11]

One of the most disturbing aspects of this pandemic is the disproportionate burden of disease experienced by ethnic and racial minorities and vulnerable populations in the U.S. as well as the lack of clear, reliable, transparent data reporting on these inequalities across the nation. For example, as of May 22, 2020, Montana, Nebraska, Utah, and North and South Dakota have not provided public data on deaths stratified by race. Across the country, Blacks and African-Americans are dying at rates nearly three times higher than non-Hispanic whites. Blacks, Latinxs, and Native Americans are disproportionately experiencing higher rates of death than non-Hispanic whites and Asians, and there are glaring disparities in access to testing, health care, and hospitalization.[12, 13]

7 Furukawa et al. Evidence supporting transmission of severe acute respiratory syndrome coronavirus 2 while presymptomatic or asymptomatic. Emerg Infect Dis. 2020 Jul. https://doi.org/10.3201/eid2607.201595.

8 Arons et al. Presymptomatic SARS-CoV-2 infections and transmission in a skilled nursing facility. N Engl J Med. DOI: 10.1056/NEJMoa2008457.

9 Baggett TP, Keyes H, Sporn N, Gaeta JM. Prevalence of SARS-CoV-2 Infection in Residents of a Large Homeless Shelter in Boston. *JAMA*. Published online April 27, 2020. doi:10.1001/jama.2020.6887.

10 CDC COVID-19 Response Team, "Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020," MMWR, March 27, 2020.

11 Oxley, Thomas et al., "Large-Vessel Stroke as a Presenting Feature of Covid-19 in the Young," *NEJM*, April 28, 2020, https://www.nejm.org/doi/full/10.1056/NEJMc2009787.

12 Pilkington, Ed, "Black Americans dying of Covid-19 at three times the rate of white people," *The Guardian*, May 20, 2020, https://www.theguardian.com/world/2020/may/20/black-americans-death-rate-covid-19-coronavirus.

13 CDC, "COVID-19 in Racial and Ethnic Minority Groups," (April 22, 2020) https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/racial-ethnic-minorities.html.

Individuals who live in congregate settings such as homeless shelters or are detained or imprisoned in prisons or jails are also experiencing high rates of disease. This pandemic has highlighted the widespread inequalities in the burden of disease experienced by vulnerable populations and the compounded impact of racism, structural violence, economic injustice, and lack of access to guaranteed health care.

In the United States and elsewhere, this pandemic has thrown into stark contrast and worsened many of the glaring inequities, disparities, and gaps in health care that existed prior to the emergence of COVID-19.

6. Isn't influenza worse than COVID-19?

There have been numerous mentions in the media that influenza is somehow worse than COVID-19.

Those comparing the two often argue that the attention to COVID-19 is unwarranted and those concerned are overreacting. They may cite data on the high number of influenza deaths annually in support of their argument.

However, while the two viruses are similar in some respects, such as their symptoms, there are important differences:

- The mortality rate for COVID-19 appears to be higher than most strains of influenza,
- We have no immunity to COVID-19 as it is an emerging infectious disease,
- There is no vaccine for COVID-19, and
- Antiviral medications can be used to treat the symptoms of influenza and shorten its duration, while antiviral medications for COVID-19 are currently only in the testing phase.
- The full dynamics of transmission and infection are still unknown.

7. How is the virus transmitted?

We don't have full evidence yet, so, under precautionary principle, all precautions must be implemented.

Here are the possible ways that COVID-19 could be transmitted (there is not full evidence on any of these transmission pathways):

- Through breathing in small particles in the air expelled after someone talks, coughs or sneezes, or an aerosol-generating procedure is performed on someone with an infection;
- Through small droplets that are inhaled or land directly on a person and subsequently come in contact with a mucous membrane (eyes, nose, mouth); and
- Through contact via touching a contaminated surface or object and then touching a mucous membrane.

Recent research provides increasing evidence that SARS-CoV-2 is transmitted via droplet, contact, and airborne transmission:

- A recent study of SARS-CoV-2 aerosolization from the University of Nebraska found widespread environmental contamination on air handling grates and window ledges greater than 6 feet away from the patients as well as positive air samples in the hallways.[14]
- Chin et al. found SARS-CoV-2 can survive and remain infectious outside the human body for up to 14 days on different surfaces including surgical masks and various materials such as stainless steel, plastic, wood, and glass.[15]
- A recent simulated study of physicians and nurses performing airway management found contamination (fluorescent markers) on uncovered skin, hair, and shoes.[16] These findings underline the importance of optimal personal protective equipment to protect nurses and other healthcare workers from exposure to SARS-CoV-2.

14 Santarpia, Joshua L et al., "Transmission Potential of SARS-CoV-2 in Viral Shedding Observed at the University of Nebraska Medical Center," medRxiv (pre-print), March 26, 2020, https://www.medrxiv.org/content/10.1101/2020.03.23.20039446v2.

15 Chin, Alex W H et al. "Stability of SARS-CoV-2 in different environmental conditions," *The Lancet Microbe*, April 2, 2020, https://www.sciencedirect.com/science/article/pii/S2666524720300033?via%3Dihub.

16 Feldman O, Meir M, Shavit D, Idelman R, Shavit I. Exposure to a Surrogate Measure of Contamination From Simulated Patients by Emergency Department Personnel Wearing Personal Protective Equipment. *JAMA*. Published online April 27, 2020. doi:10.1001/jama.2020.6633.

Contact and airborne precautions must be maintained for all patients with possible or confirmed COVID-19 infections. Based on the precautionary principle:

- Protections should be implemented for all patients who are under investigation for COVID-19 until COVID is confidently ruled out or the patient recovers and is discharged.
- Protections should be implemented for all patients who are probable COVID-19 cases—they have symptoms that match and all other diagnoses are ruled out (e.g., influenza, other coronaviruses), their test results are pending, their test results are indeterminate, etc.
- Protections should be implemented for all patients who are confirmed COVID-19 patients until discharged and a plan should be made for if or how long they will be on isolation when discharged.

8. Why are droplet precautions insufficient?

Airborne precautions are needed. Respiratory aerosols are created every time someone infected sneezes, coughs, even talks. These aerosols can stay suspended in the air. These aerosols are of disparate sizes—some are big droplets and others are tiny particles that can stay airborne. Some droplets will settle, others will evaporate, so anytime you have an illness with respiratory symptoms you will have both droplet and airborne, and how much each is a concern depends on a lot of complex situational factors.

A recent study funded by NIH/CDC indicates that infectious COVID-19 viral particles could stay suspended in the air for up to three hours, which was the longest time the researchers tested.[17] Following this study, Fears et al. also looked at the viability and persistence of SARS-CoV-2 in aerosols and found that the virus can remain infectious for up to 16 hours when suspended in particles in the air.[18]

Droplet precautions only protect you from what can be projected directly onto your face, you, or a surface; any of the smaller particle sizes and aerosols that are created when you cough or sneeze can still be inhaled. So, if you have a simple face mask, all of those smaller particles can still be inhaled around the edges of that mask (vs an N95 respirator mask, which seals to the user's face and filters the air, thus preventing those aerosols from entering the nose and mouth).

Contact precautions are also needed—many viruses are spread through contact with contaminated surfaces or objects and then touching the eyes, face, mouth, etc. This means that the virus can potentially spread on equipment, surfaces, clothing, etc., if health care workers do not have the proper personal protective equipment (PPE) and/or if proper environmental cleaning and disinfection protocols are not in place.

Bottom line, this is a new disease so the precautionary principle requires that we take all precautions. This is why NNU advocates that nurses and other health care workers caring for patients with suspected or confirmed COVID-19 must have the highest level of PPE, including powered air-purifying respirators (PAPRs), coveralls that are resistant to viral penetration, gloves, temporary scrubs, and other protections. Under no circumstances should respiratory protection be less protective than an N95 respirator for COVID-19. Surgical masks provide no respiratory protection.

9. Why are asymptomatic infections a concern?

One of the main reasons this virus is so dangerous and difficult to control is the fact that asymptomatic and presymptomatic infections widely occur and these individuals can be highly infectious. In fact, several studies have emerged indicating that the most infectious period may actually be the first several days after exposure before symptoms develop.

Asymptomatic infections are concerning because it means that people with no concerning signs or symptoms of COVID-19 may falsely believe they are not infectious and unintentionally spread infection to numerous people through routine activities of work, commerce, and social engagement. Their unintentional exposure can cause dozens of infections, which may cause additional infections as those individuals expose others and the pattern of infection exponentially continues to increase.

17 Van Doremalen, Neeljte et al. (March 17, 2020), "Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1." *NEJM*, published online at https://www.nejm.org/doi/full/10.1056/NEJMc2004973?query=featured_home.

18 Fears, Alyssa C. et al., "Comparative dynamic aerosol efficiencies of three emergent coronaviruses and the unusual persistence of SARS-CoV-2 in aerosol suspensions," medRxiv, April 18, 2020, https://www.medrxiv.org/content/10.1101/2020.04.13.20063784v1.

10. When will a vaccine be available?

In a best case scenario, it will be a minimum of a year. It is a slow process to develop a vaccine. There are numerous efficacy and safety trials that must be completed first. Some vaccine candidates are already in development, and various large pharmaceutical companies have announced movement on coronavirus vaccines. However, at this point, there is nothing concrete in the pipeline of development that would be readily available.

11. Will warm or hot weather really mean you are less likely to come down with COVID-19?

We have heard a lot of people say this, probably intending to reduce panic. But we do not have the information or knowledge about SARS-CoV-2 to be able to say that with certainty yet. What we do know is that it is extremely important for health care employers and our public health agencies to take all possible steps now to protect nurses and other health care workers, your patients, and our communities.

12. Can children get infected with COVID-19?

Children can be infected but the majority may have a milder or asymptomatic illness that is harder to identify. A study published March 3 showed a significant number of cases detected in children in Shenzhen, which is a province in China outside the epicenter that had lots of cases and controlled an outbreak through rapid and early screening, testing, isolation, other measures. This study indicated that children were an important part of transmission through families.[19]

Despite the relatively fewer cases of COVID-19 among children, there have still been pediatric deaths in the U.S. and around the world. In addition, there is emerging evidence of a severe and sometimes fatal pediatric inflammatory syndrome that may follow weeks after a child is exposed to COVID-19 or the SARS-CoV-2 virus.

On May 14, the CDC put out a health advisory and case definition for a new syndrome associated with a history of COVID-19 exposure named multisystem inflammatory syndrome in children (MIS-C). This inflammatory syndrome was initially reported as a case series of Kawasaki disease-like presentations in the UK and Europe that were temporally associated with peaks in COVID-19 cases and noted to emerge as New York's COVID-19 cases began to spike as well.

The CDC case definition as of May 18, 2020, is "An individual aged <21 years presenting with fever, laboratory evidence of inflammation, and evidence of clinically severe illness requiring hospitalization, with multisystem (>2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic, or neurological); AND No alternative plausible diagnoses; AND Positive for current or recent SARS-CoV-2 infection by RT-PCR, serology, or antigen test; or COVID-19 exposure within the four weeks prior to the onset of symptoms."

Many of these patients may present meeting the full or partial criteria for Kawasaki disease but should still be reported if they also meet the case definition for MIS-C. Children may present with fever, rash, conjunctivitis, nausea, vomiting, abdominal pain, diarrhea, lymphadenopathy, swelling of extremities, fatigue, chest pain or tightness, and many other signs or symptoms. Though similar to Kawasaki disease, these patients often present with significantly worse lab evidence of inflammation, cardiac injury or cardiogenic shock, and severe GI symptoms. The majority of patients reported require ICU admission and care for shock, and there have been several reported deaths.

Case reports thus far show most children have no underlying medical conditions, but nearly all patients sharing this Kawasaki-like presentation have serological evidence of past infection or exposure to SARS-CoV-2 even if they are currently RT-PCR negative for active infection. As more is learned about this syndrome, there will likely be a spectrum of severity. However, at this time, any patients presenting with signs or symptoms concerning for this syndrome should be evaluated for possible inpatient admission and observation.

13. How long is someone who is asymptomatic contagious?

The exact time period for which someone is contagious is unknown. Conventionally, the incubation period for the virus is believed to be 14 days, with most cases occurring approximately 4–5 days after exposure. Some

19 Liu, Jiaye et al. (March 3, 2020), "Community Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, Shenzhen, China, 2020," Emerging Infectious Diseases, online at https://wwwnc.cdc.gov/eid/article/26/6/20-0239_article.

studies suggest people may be infectious 6–7 days prior to symptom onset, with infectivity perhaps peaking 1–3 days prior to symptoms. One study showed that 44% of secondary cases were infected during index cases' presymptomatic stage. Despite this, there is likely great individual variability in viral shedding between individuals depending on their underlying medical conditions, genetics, history of exposure, and severity of illness.

We know that even asymptomatic people's specimens may test positive for viral RNA for several weeks after initial infection. However, it is unknown at this time whether those samples represent infectious virus or viral fragments.[20]

14. Is it safe for my state to re-open? I'm worried about what this will mean for my safety at work.

NNU strongly cautions that calls to "reopen the country" are premature. The threat of the virus causing COVID-19 is not yet behind us. To effectively respond to this pandemic before loosening social distancing measures, nurses are calling on the government and employers to meet the following criteria:

Basing health care capacity and preparedness on need, not profit. Before reopening the country, nurses and other health care workers must have the optimal personal protective equipment (PPE) they need, including powered air-purifying respirators, coveralls that incorporate head coverings and shoe coverings, and gloves. Otherwise, hospitals will continue to be places that spread infection, and nurses and health care workers will continue to get sick and sidelined, die, and be unable to care for the next wave of patients.

It is clear to nurses that the industry thinks they have produced an acceptable solution to the PPE shortage by implementing widespread use of various N95 decontamination systems. This is unacceptable and unsafe. Before reopening the country, President Trump must activate the Defense Production Act to order the mass production of PPE.

Health care capacity must also be expanded, and people must be able to get treatment they need if they contract COVID-19 — at no cost. Any vaccine developed with U.S. taxpayer dollars must also be provided to the public in America for free when needed.

CDC, WHO, OSHA guidelines and standards must be strengthened. The risk for airborne transmission of the virus is now documented, and before reopening the country, nurses demand that the Centers for Disease Control (CDC) and the World Health Organization (WHO) recognize this and strengthen their guidelines accordingly. The Occupational Safety and Health Administration (OSHA) must also pass an emergency temporary standard to mandate that health care employers provide protections needed for COVID-19.

Public health infrastructure must be strengthened to include sufficient staffing, supplies, and space for robust surveillance, testing, case isolation, and contact tracing to ensure that the virus is effectively contained.

While considering "reopening the country," nurses also emphasize that this pandemic has exposed underlying problems in our society and illuminated the damage done by neoliberal economic policies that are beneficial to a limited few and a profit-driven health care system.

Ensuring basic human needs are met. People in America must have enhanced unemployment benefits and paid sick time and family leave, food security, housing, healthcare, and other social supports for people who are unemployed or unable to work due to illness or quarantine and isolation measures.

As caregivers, nurses emphasize that we cannot return to the damaging way things were. This time is instead an opportunity to reimagine how we can organize our society in ways that are beneficial to everyone as opposed to a handful of billionaires. It's a time to focus on building an economy that's not based on consumption of things, but rather on care for people.

15. Does HIPAA prevent hospitals from talking to nurses and the union about COVID-19 cases and preparedness plans?

Hospitals and other health care facilities are obligated to discuss what plans, protocols, and precautions they have in place to protect nurses and other health care workers from workplace hazards, including exposure to COVID-19.

20 He X, Eric HY, Wu P, et al. Temporal dynamics in viral shedding and transmissibility of COVID-19. *Nature Medicine*. April 15, 2020. https://doi.org/10.1038/s41591-020-0869-5.

Hospitals and other health care facilities have a duty to inform nurses and other health care workers of the hazard they may face within their workplace, including possible exposure to COVID-19 and other occupational infectious hazards.

It is possible for hospitals and other health care facilities to provide information regarding the presence of confirmed COVID-19 cases and patients under investigation (PUIs) without violating HIPAA laws that protect the individual patient's right to privacy.

16. Is hand sanitizer effective against SARS-CoV-2?

While hand sanitizers with high levels of alcohol (>60%) may kill some pathogens on your hands (it doesn't remove those pathogens), soap and water more effectively remove the pathogens from your hands and should be your first choice.

The use of hand sanitizer should be thought of as an alternative if and when you don't have access to soap and water. The U.S. Food and Drug Administration (FDA) has been cracking down on Purell and other hand sanitizer manufacturers' claims that they are effective against COVID-19.[21]

We know that hand sanitizer can inactivate many viruses, but there are not yet hard data to say that hand sanitizer is as effective or should be promoted as best for this specific coronavirus when compared to soap and water.

17. I've heard about compact licensure in several states. Can you tell me more?

California is not a compact licensure state and we believe for good reason. California patients are protected by some of the country's highest standards for registered nurse licensing, as outlined in our state's nursing practice act. If the way compact licensure worked was that the highest standards of any participating state applied, that would be ideal, but that's sadly not the case. Also, people don't realize that multi-state compact licensure removes control and regulation of nurse licensing away from publicly accountable government agencies (the state boards of registered nursing) to a private group, the National Council of State Boards of Nursing. You can learn more in detail all about the pitfalls of the national licensure compact in this article that we published in our magazine, *National Nurse*.

Nurses from across the country are welcome to practice in California and many do move here to work because of our first-in-the-nation RN-patient staffing ratios, our excellent compensation and benefits due to high unionization rates, and overall strong worker protections, but the California State Board of Registered Nursing has its own vetting process to ensure the safety of and accountability to the public. All the more reason to have a robust California BRN to thoroughly check out the qualifications of applying nurses—even more important in times of emergency!

That said, the governor has flexibility in times of emergency with these regular licensing rules.

B. Understanding Testing for COVID-19

18. Why are there so many issues with testing?

Initially, the Centers for Disease Control (CDC) was the only place that could perform tests for COVID-19. There was limited capacity and long delays to get results because samples had to be sent to Atlanta. After getting an Emergency Use Authorization (EUA) from the Food and Drug Administration (FDA) in early February, the CDC could then start sending test kits to state public health labs to expand testing capacity.[22]

But the CDC's roll out of test kits to state public health labs was delayed because one of the three test components was faulty, resulting high numbers of inconclusive results. The CDC states that the issue has since been resolved.[23]

21 See point number 2 in the letter NNU sent to the CDC on February 19, 2020: https://act.nationalnursesunited.org/page/-/files/graphics/CDC_Letter_NNU.pdf

22 https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations

23 https://www.cdc.gov/media/releases/2020/t0228-COVID-19-update.html

But testing capacity has still been limited. The CDC reported on March 9 that they expect soon the U.S. will have capacity to test 75,000 people.[24] This continues to fall far short of need. Other countries around the world have had significantly higher testing capacity, which has proven to be an important part of their response.[25]

Furthermore, the CDC has delayed updates to their screening criteria, or how they determine who is allowed to be tested. It was not until several days after community transmission was confirmed that the CDC expanded their screening criteria beyond known exposure to a confirmed case or travel history to an affected region. Vice President Pence announced that anyone can be tested, but there have still be reports of the CDC refusing tests for patients they think do not meet criteria. Some of those refused tests have been health care workers who have developed symptoms after caring for patients with COVID-19.[26] NNU advocates that testing capacity needs to be used and expanded and, where there is limited capacity, health care workers should be prioritized for testing.

19. What is the process for patients to be tested?

Testing processes vary widely by facility, city, county, and state and there is no uniform process across the country for accessing testing. In some areas, people may access testing by calling their primary care office and obtaining a referral for testing at their office, commercial lab, or other testing site; some commercial or county sites have walk-in or drive-by testing or specimen collection; others may access testing through filling out online screening form as directed by a clinician; testing may be available directly at an occupational or employee health venue as part of an occupational exposure; and there are some non-FDA approved home testing kits available. Access to testing in some areas may be extremely limited.

The clinical criteria recommended by the CDC have changed several times over the course of the pandemic. As of May 21, 2020, the CDC criteria have two tiers of priority for nucleic acid or antigen testing for COVID-19: high priority and priority.

- The CDC criteria still emphasize as high priority those experiencing symptoms, including: symptomatic hospitalized patients, symptomatic health care facility workers, workers in congregate living settings and first responds, and symptomatic residents in long-term care facilities or other congregate living facilities such as prisons and shelters.
- The CDC criteria also deem priority testing for any persons with symptoms of potential COVID-19 infection, including: fever, cough, shortness of breath, chills, muscle pain, new loss of taste or smell, vomiting or diarrhea, and/or sore throat;
- As well as priority testing for people WITHOUT symptoms prioritized by health departments or clinicians, for any reason, including but not limited to: public health monitoring, sentinel surveillance, or screening of other asymptomatic individuals according to state and local plans.

Individual state, county, or facility priorities for testing may vary. For example, the California Department of Public Health's testing priority's Tier 1 as of May 1, 2020, now includes symptomatic AND asymptomatic health care workers, first responders, and other social service employees or people in essential occupations. The full listing of California testing priorities may be found here: https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Expanding-Access-to-Testing-Updated-Interim-Guidance-on-Prioritization-for-COVID-19-Laboratory-Testing-0501.aspx.

20. What should testing look like? Are there issues with the CDC guidance on testing?

Initial CDC guidance on testing at the start of the pandemic in the U.S. was severely restricted to only people with very specific symptoms and a history of international travel or close contact with a laboratory-confirmed case of COVID-19. On March 4, the CDC changed their screening criteria to allow any clinician to use their judgment to determine whether a test for COVID-19 was appropriate for any *symptomatic* patient.

The initial narrow testing guidelines combined with very limited testing capacity throughout February and March permitted a false sense of security as undiagnosed infections slowly and silently spread throughout the U.S. during these valuable weeks and months. Initial guidelines restricting testing to severely ill or very

24 https://www.cdc.gov/media/releases/2020/t0303-COVID-19-update.html

25 https://www.sciencedirect.com/science/article/pii/S0140673620305511?dgcid=rss_sd_all

26 See statement from an NNU nurse about testing issues, online at https://act.nationalnursesunited.org/page/-/files/graphics/NU-Quarantine-RN-press-conf-statement.pdf.

symptomatic patients only meant we missed out on characterizing the widespread mild or asymptomatic cases. Though there has been a significant increase in testing capacity since the start, we are still playing catch up to test the number of people needed to fully understand the scope and prevalence of infection.

CDC criteria still emphasize testing symptomatic patients as high priority (see previous question). Though it is extremely important to test people who are already ill, we must also be widely testing and prioritizing testing anyone who may have a history of exposure in order to get ahead of community spread of infection. This is a strategy that other countries have used to effectively prevent or contain widespread transmission of this virus.

In the U.S., there are clear disparities in testing capacity and access between different communities, localities, and states. These disparities have also hampered the U.S.'s ability to contain the spread of this virus. We must work to make testing widely and reliably available throughout the country.

In order to safely move forward, there must be sufficient staffing, supplies, and space for robust surveillance, testing, case isolation, and contact tracing to ensure that the virus is effectively contained. This includes making access to free, reliable polymerase chain reaction (PCR) testing widely available — including to low-income communities and communities of color — regardless of known exposure or symptom status.

We also need widespread comprehensive surveillance, contact tracing, and case isolation including repeated, random population surveys of asymptomatic people, increased syndromic surveillance that includes early detection of comparable indicators (e.g., influenza-like illness), thorough contact tracing to identify all potentially infected contacts for each case; case identification, contact tracing, and isolation both within the workplace and the community; and incorporation of the unique skill and expertise of nurses to assist with contact tracing and public health education without an exclusive reliance on technology alone to perform those functions.

Successful testing also includes making clear and reliable data publicly available in a timely fashion; continued reporting by health care facilities to local/state/federal government on admissions/ICU admissions/negative pressure room and ventilator availability; cautious use of antibody testing; transparent, real-time reporting of testing data, including at minimum data on race, occupation, and county; and strict oversight of performance, manufacture, reliability, accuracy, and distribution of both diagnostic and serological testing.

21. What does the COVID-19 test actually tell us?

There are now multiple types of testing for COVID-19, but the best test available to check for active or current infection is still RT-PCR, which is a molecular form of testing.

There are two types of testing that check for active infection:

- RT-PCR testing (reverse transcription-polymerase chain reaction test): These tests amplify and look for a specific fragment of the virus' RNA. The most common specimens are through nasopharyngeal (NP) or oropharyngeal (OP) swabs, but they can be performed on many other samples such as sputum, saliva, blood, or stool. Laboratory amplification tells you whether there are enough viral RNA particles present in a sample to register as a positive result. This is still the preferred form of testing to diagnose an active infection and COVID-19 in patients.
- Antigen testing: These tests detect viral protein fragments, usually in a NP or nasal swab. They are very specific for the virus, but are not as sensitive, meaning they may have a much higher (and dangerous) rate of false negative results.

Testing that looks for exposure to infection or evidence of past infection:

- Antibody (serology) testing: These tests look for antibodies to SARS-CoV-2 virus, usually via a venous blood sample. They measure the antibody response to a set viral protein target. Antibodies may take days to weeks to develop after infection and some individuals may not produce as many antibodies or may have a delay in antibody production. Positive antibody testing does NOT mean that a patient is immune. A positive antibody test at this point ONLY can tell us this individual may have been exposed to or experienced a SARS-CoV-2 infection, but it may also indicate a false-positive result.

Any form of testing must be both RELIABLE and ACCURATE and be clinically validated in a laboratory. In order to be highly accurate, a test must be both highly SENSITIVE (have the ability to detect true positives) AND be highly SPECIFIC (have the ability to detect true negatives). Otherwise, there is the risk of individuals falsely testing positive or falsely testing negative, causing both inaccurate clinical and personal decisions about a person's risk of infection or risk of infecting others.

Unfortunately, there has been misleading marketing and use of serological testing (including antibody testing) that has not been overseen or regulated by the FDA. Not all tests measure the same antibodies and most tests do not measure everything. Some tests are not specific to SARS-CoV-2 and may measure antibodies for any coronavirus, including those that cause the common cold.

22. Why should precautions be maintained for a patient who has tested negative?

Two reasons:

1. A negative result does not necessarily mean an individual does not have COVID-19. The COVID-19 test is an RT-PCR test that only tells us if there are enough viral particles in the sample to register on the test (see above). A recent study found that 48% of patients with a negative COVID-19 PCR test were considered highly likely cases based on chest CT findings.[27]
2. There continue to be reports that patients can test positive again after testing negative.[28] Precautions should be maintained for COVID patients even if they test negative once. This is an important element in ensuring that nurses and other healthcare workers are not exposed or infected at work.

23. What about antibody testing? Does a positive antibody test mean you are immune?[29,30]

Any suspected COVID-19 case should be investigated further, and all protections and precautions (see question 22) taken until ruled out.

Antibody (serology) testing looks for antibodies to SARS-CoV-2 virus, often from a venous blood sample and sometimes with a fingerprick. Antibody or serologic tests measure the antibody response to a set viral protein target. Antibodies are part of the body's adaptive immune system and may take days to weeks to develop after infection. For a number of reasons (age, genetics, immunosuppression, other medical conditions) some individuals may have delayed, impaired, or virtually no antibody production.

At this time, there is no universal standard reporting for antibody results and the limits of detection for each test are highly variable. There is not evidence or research at this time to answer questions we need to know such as: Are there broadly neutralizing antibodies present? Which antibodies could be protective? What level, quantity or titer of antibodies would be protective? How long do these antibodies last? Will antibody production mean sustained or durable protection from the virus? Prior infection and antibody production from other coronaviruses such as SARS, MERS, and the common cold, do not appear to confer long-lasting immunity, so there is reason to believe that SARS-CoV-2 may behave similarly.

Therefore, at this point, a positive antibody test does NOT mean someone is immune to infection or reinfection with COVID-19. A positive antibody test also does NOT tell you whether or not someone is still infectious. It is very important to interpret antibody tests cautiously.

27 Ai, Tao et al. (Feb 26, 2020), "Correlation of Chest CT and RT-PCR Testing in Coronavirus Disease 2019 (COVID-19) in China: A Report of 1014 Cases," *Radiology*, published online at https://pubs.rsna.org/doi/full/10.1148/radiol.2020200642.

28 https://www.cidrap.umn.edu/news-perspective/2020/02/some-covid-19-patients-test-positive-days-after-recovery.

29 Infectious Diseases Society of America, "IDSA COVID-19 Antibody Testing Primer," may 4, 2020, https://www.idsociety.org/globalassets/idsa/public-health/covid-19/idsa-covid-19-antibody-testing-primer.pdf.

30 California Department of Public Health, "Guidance for Healthcare Providers: Testing for COVID-19: PCR, Serology and Antigen," May 15, 2020, https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Guidance-for-Health-Care-Providers.aspx.

- A positive antibody test COULD mean that someone was infected more than a week ago with SARS-CoV-2, they had a past infection, OR, it could be a false positive result and they have not had a COVID-19 infection.
- A negative antibody test COULD mean that someone had no recent or prior SARS-CoV-2 infection, they have a current early SARS-CoV-2 infection and have not produced antibodies yet, or it could be a false negative result despite someone having experienced a true COVID-19 infection.

Antibody testing is best suited to population-level surveillance to understand prevalence of the disease and should not be used for individual acute clinical diagnosis at this time. RT-PCR tests are the best diagnostic tests to check for active infection with the SARS-CoV-2 virus.

There are additional issues around antibody tests in the U.S. Unlike RT-PCR tests, the U.S. Food and Drug Administration (FDA) has not required review and approval for new SARS-CoV-2 serological tests, including tests for antibodies. This lack of oversight means that it is unclear how reliable or accurate tests are. Tests should be validated in a laboratory with manufactured reagents. In order to be highly accurate, a test must be both highly SENSITIVE (have the ability to detect true positives) AND be highly SPECIFIC (have the ability to detect true negatives). Some manufacturers are falsely marketing their tests and not making these data available, which are necessary in order to assess the validity of the test. Some assays provide quantitative results while others provide only qualitative (yes/no) results. Some combine results for both IgG and IgM and may not be very specific to the SARS-CoV-2 virus and instead measure response to other coronaviruses or other viral infections.

Please see NNU's antibody testing brief for more information: https://act.nationalnursesunited.org/page/-/files/graphics/0420_Covid19_IssueBrief_AntiBodyTesting1.pdf

C. Protections for Nurses and Other Health Care Workers

24. What precautions or protections do nurses and other health care workers need?

COVID-19 is a novel virus; there's a lot we don't know. That means nurses and other health care workers need the highest level of protection, following the precautionary principle. We need to start with the highest level of protection—we can always take layers off as we go, but we cannot go backwards and add protections after the fact.

Here is what NNU is advocating that health care employers must implement to protect nurses and other health care workers from exposure to COVID-19:

1. Employers shall implement plans and protocols in response to COVID-19 based on the precautionary principle which holds that lacking scientific consensus that a proposed action, policy, or act is not harmful—particularly if that harm has the potential to be catastrophic—such action, policy, or act should not be implemented and the maximum safeguards should be pursued.
2. Employers shall clearly communicate with all nurses and other health care workers, including notifying nurses when there is a possible or confirmed COVID-19 case.
3. Employers shall provide education and training for all nurses and other health care workers, including on protective gear, donning and doffing, and all other protocols relating to COVID-19.
4. Employers shall provide the highest level of protection including functioning negative pressure rooms at all times and personal protective equipment for nurses providing care to possible and confirmed COVID-19 cases. To include PAPR, coveralls meeting ASTM standard, gloves, temporary scrubs, and other protections.
5. Employers shall plan for surge of patients with possible or confirmed COVID-19 including plans to isolate, cohort, and to provide safe staffing.
6. Employers shall conduct a thorough investigation after a COVID patient is identified to ensure all staff and individuals who were exposed are identified and notified. Any nurse or other health care worker who is exposed to COVID-19 will be place on precautionary leave for at least 14 days and will maintain pay and other benefits during the full length of that leave.

For more information, visit https://www.nationalnursesunited.org/covid-19.

25. Are contact, droplet, or airborne precautions needed for COVID-19?

Airborne and contact precautions are needed. This is a new virus and there's lots we still don't know about transmission. There is no clear or decisive evidence to confirm or deny transmission pathways (see questions 7 and 26–29).

26. What PPE is needed for nurses providing care to patients with COVID-19?

NNU advocates that nurses should have the highest standard of PPE, based on the precautionary principle, which should include:

- Powered air-purifying respirators (PAPRs)
- Coveralls that are impermeable to viral penetration
- Gloves
- Temporary scrubs

Under no circumstances should the respiratory protection provided to nurses and other health care workers be less protective than an N95 respirator. Surgical masks do not offer respiratory protection and should not be used to prevent exposure to COVID-19.

27. Why do nurses need coveralls? Why aren't isolation gowns sufficient?

There are three possible transmission pathways that viruses, especially those that cause respiratory symptoms, can follow: contact (direct/indirect), droplet, and aerosol transmission. There is currently no evidence that confirms the transmission pathway(s) for SARS-CoV-2/COVID-19.

SARS-CoV-2/COVID-19 is similar to SARS-CoV and, to a lesser degree, MERS-CoV. There is sufficient evidence to indicate that direct and indirect contact, droplet, and aerosol transmission are important to the transmission of both SARS-CoV and MERS-CoV.

Given the lack of information about SARS-CoV-2 and what is known about SARS-CoV and MERS-CoV, ensuring that nurses and other health care workers have all body surfaces and clothing covered is important.

Basic isolation gowns, as recommended by the CDC, are insufficient protection because they leave parts of the health care worker's skin and clothing vulnerable to exposure contact (direct/indirect), droplet, and aerosol transmission. A recent study found that after doffing PPE (gloves, face mask, and gown), 21% of bare hand samples, 11% of scrub samples, and 7% of face samples showed contamination with viral particles matching the infected patient receiving care.[31] Additionally, isolation gowns may not meet standards for preventing viral penetration (ASTM F1671/ISO 16604 or similar).

In an emergent infectious disease event, this is an unacceptable risk.

28. What type of respiratory protection do RNs and other health care workers caring for a possible or confirmed patient with COVID-19 need?

While an N95 respirator is the absolute minimum level of respiratory protection for COVID-19, NNU recommends the highest level of protection for COVID-19, which includes the use of a powered air-purifying respirator (PAPR) for patients with suspected or confirmed COVID-19 infections (Figure 1).[32]

Hood Powered Air-Purifying Respirator (PAPR)

Figure 1 - PAPR

Respiratory and eye protection are necessary elements of protection for COVID-19 (also see questions 7 and 8). The CDC recommends a combination of goggles plus an N95 respirator or surgical mask. The CDC's recommendations are insufficient and not protective. Surgical masks provide no respiratory protection—they do not seal to the face (allowing viral

31 Phan, L.T., et al., Respiratory viruses on personal protective equipment and bodies of health care workers. *Infection Control & Hospital Epidemiology*, 2019. 40(12): p. 1356-60.

32 https://www.osha.gov/Publications/3352-APF-respirators.pdf, accessed March 9, 2020

particles to still be breathed in) and they are not made with the filter medium necessary to filter out pathogens.

The combination of N95 respirators with goggles is not as protective as a PAPR, which combines eye and respiratory protection. OSHA strongly recommends using respirators that combine eye and respiratory protection (like a PAPR) when both are needed:

Since eye glasses or goggles may interfere with the seal of half-facepieces, it is strongly recommended that full-facepiece respirators be worn where either corrective glasses or eye protection is required, since corrective lenses can be mounted inside a full-facepiece respirator. In addition, the full-facepiece respirator may be more comfortable, and less cumbersome, than the combination of a half-mask and chemical goggles. Goggles may disrupt the seal of the N95 respirator, undermining the protection that should be provided.[33]

Additionally, goggles plus an N95 respirator leave portions of the face, head, and neck uncovered and vulnerable to exposure. Given the lack of information about SARS-CoV-2 and what is known about SARS-CoV and MERS-COV, ensuring that nurses and other health care workers have all body surfaces and clothing covered is important.

Finally, given the expected/existing global shortage of N95s and the CDC's recommendations to conserve stock and extend/reuse N95 respirators, PAPRs are more protective because they can be disinfected. SARS-CoV has been shown (via a surrogate virus) to survive on N95 respirator material for extended periods.[34] Reuse of N95 respirators poses an additional exposure hazard.

29. What is the difference between a surgical mask and an N95 respirator (sometimes called an N95 mask)?

From the FDA website:[35]
A **surgical mask** is a loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment (Figure 2). These are often referred to as face masks, although not all face masks are regulated as surgical masks. Note that the edges of the mask are not designed to form a seal around the nose and mouth.

Figure 2 - surgical mask

An **N95 respirator** is a respiratory protective device designed to achieve a very close facial fit and very efficient filtration of airborne particles (Figure 3). Note that the edges of the respirator are designed to form a seal around the nose and mouth. Surgical N95 respirators are commonly used in health care settings and are a subset of N95 Filtering Facepiece Respirators (FFRs), often referred to as N95s.

Figure 3 - N95 respirator

From the Occupational Safety and Health Administration (OSHA) website:[36]
Surgical masks are not designed or certified to prevent the inhalation of small airborne contaminants. These particles are not visible to the naked eye but may still be capable of causing infection. Surgical masks are not designed to seal tightly against the user's face. During inhalation, much of the potentially contaminated air can pass through gaps between the face and the surgical mask and not be pulled through the filter material of the mask. Their ability to filter small particles varies significantly based upon the type of material used to make the surgical mask, so they cannot be relied upon to protect workers against airborne infectious agents.

33 https://www.osha.gov/dts/osta/otm/otm_viii/otm_viii_2.html, accessed March 9, 2020

34 Casanova, L., et al., Coronavirus Survival on Health Care Personal Protective Equipment. *Infection Control & Hospital Epidemiology*, 2010. 31(05): p. 560-561.

35 https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks, accessed March 9, 2020

36 https://www.osha.gov/Publications/respirators-vs-surgicalmasks-factsheet.html, accessed March 9, 2020.

30. Is reusing N95 respirators okay?

N95 respirators should never be reused for a pathogen where contact precautions are needed, including COVID-19. Reusing or extended use of N95 respirators should only be employed as a last resort measure.

- Reuse applies to the practice of putting on (donning) and taking off (doffing) the respirator multiple times between patient encounters. The practice of reuse increases the risk of pathogen exposure for the wearer each time they put on and take off the N95.
- Extended use refers to the practice of continuously wearing the same respirator for multiple patient encounters in a row, without repeatedly doffing and donning the respirator. Wearing an N95 can be physiologically taxing and extended use (wearing an N95 for hours at a time) can result in fatigue, headaches, reduced oxygen and increased carbon dioxide, and other harmful impacts. Frequent breaks and increased staffing are important to nurses' safety if an employer is implementing extended use policies.

If reusing N95 masks respirators is happening, it must be under the nurse's professional judgment and not a blanket instruction to reuse x many times or for x many shifts. Using reused N95 masks respirators would be particularly not recommended if a nurse is about to be exposed to an aerosol-generating procedure like CPR, intubation, open suctioning, administering nebulizers, and collecting respiratory specimens, or any procedure where a patient may cough or sneeze.

OSHA recommends:[37]

When disposable N95 filtering facepiece respirators are not available, consider using other respirators that provide greater protection and improve worker comfort. Other types of acceptable respirators include: an R/P95, N/R/P99, or N/R/P100 filtering facepiece respirator; an air-purifying elastomeric (e.g., half-face or full-face) respirator with appropriate filters or cartridges; powered air purifying respirator (PAPR) with high-efficiency particulate arrestance (HEPA) filter; or supplied air respirator (SAR).

31. My employer said that I only need to wear an N95 for five minutes following an aerosol-generating procedure. That doesn't seem right to me.

Aerosol-generating procedures (e.g., bronchoscopy, intubation, sputum induction, adminsitration of nebulized medication, etc.) can aerosolize SARS-CoV-2 and present a significant risk for infection to those exposed. PPE is essential during aerosol-generating procedures for patients with suspected or confirmed COVID-19 infections, including respiratory protection at least as protective as an N95 filtering facepiece respirator, gowns or coveralls, gloves, and eye protection such as a face shield. Cal/OSHA's Aerosol Transmissible Diseases Standard requires that powered air-purifying respirators (PAPRs) are used during all aerosol-generating procedures performed on a patient with a suspected or confirmed COVID-19 infection.

There is no evidence to say that it is safe to switch to a surgical mask after aerosolizing. In fact, the evidence indicates that the aerosols created by aerosol-generating procedures can stay suspended in the air for a period of time after they are created.

Guidance from the CDC so far has been that nurses should change their PPE after aerosol-generating procedures due to contamination of their PPE during the procedure, but this guidance has been to maintain an N95 level of protection following the procedure.

The 5-minute mark is not grounded in scientific evidence.

32. Do homemade masks provide protection?

No, homemade cloth masks do not provide respiratory protection. Unlike N95 filtering facepiece respirators used in health care settings, cloth masks have neither the particle filtration mechanism nor the airtight face seal design to filter at least 95% of infectious particles, and protect against droplet spread, splashes, and other body fluids. One study reported that cloth or homemade masks provided little to no protection for respiratory illnesses due to poor filtration and pathogen retention.[38]

37 See page 15 of OSHA's Guidance on Preparing Workplaces for COVID-19, https://www.osha.gov/Publications/OSHA3990.pdf.

38 MacIntyre CR, et al. A Cluster Randomised Trial of Cloth Masks Compared with Medical Masks in Healthcare Workers. BMJ Open, 2015. DOI: 10.1136/bmjopen-2014-006577

Wearing masks can be an important part of source control because a mask can reduce the respiratory droplets emitted by the wearer. However, according to one study, surgical masks were three times more effective at reducing respiratory droplets emitted by the wearer than homemade cloth masks.[39]

33. What is the difference between industrial and surgical/medical N95 respirators?

Both industrial and surgical N95 respirators are certified by NIOSH (National Institute of Occupational Safety and Health) for filtration efficiency, breathing resistance, and other protective factors. Fit testing and user seal checks are mandated for both types of respirators by OSHA. While similar in appearance, the key difference between surgical/medical N95 respirators and industrial N95 respirators is the required clearance from the FDA (Food and Drug Administration) for fluid resistance capability for surgical/medical N95s. This fluid resistance is important for a respirator to provide air filtration even with a splash or spray (the N95 should then be discarded after any contamination from splash or spray).

While surgical and industrial N95 respirators share similarities, there are key differences that distinguish the two:

Differences Between Industrial and Medical N95s	
SURGICAL/MEDICAL N95 RESPIRATORS, commonly used in health care settings[40, 41]	**INDUSTRIAL N95 RESPIRATORS**
Both are NIOSH-certified to filter at least 95% of non-oily particles that are 0.3 µm in diameter	
Both are cleared by the FDA as a medical device	
Both require annual fit-testing and training AND user seal check before each use to ensure proper fit	
Both require health care employers and workers to follow the OSHA Respiratory Protection Standard, 29 CFR §1910.134, or the state's respiratory protection program, whichever is greater.	
	Industrial N95s with exhalation valves, which help ease breathing and reduce heat build-up, should NOT be used in health care settings where a sterile field is required. The valve would allow unfiltered exhaled air to escape into the sterile field.[42]

34. Can I wear an N95 respirator if I have facial hair?

For an N95 filtering facepiece respirator or any other tight-fitting respirator to provide protection, it must form a tight face seal. Some beards or facial hair may interfere with the face seal formed by the N95 which would undermine its ability to protect the wearer. This CDC/NIOSH infographic shows some styles of facial hair that may be compatible with wearing an N95 respirator so long as they do not interfere with the face seal: https://stacks.cdc.gov/view/cdc/51912/cdc_51912_DS1.pdf.

There are many types of respirators available that do NOT require a tight face seal and therefore do not require shaving of facial hair. Specifically, a powered air-purifying respirator (PAPR) with a hood, helmet, or other loose-fitting headpiece does not require shaving of facial hair. PAPRs provide a higher level of

39 Davies, A., et al. Testing the Efficacy of Homemade Masks: Would They Protect in an Influenza Pandemic? Disaster Medicine and Public Health Preparedness, Cambridge University Press, 2013. DOI: 10.1017/dmp.2013.43

40 https://multimedia.3m.com/mws/media/1794572O/surgical-n95-vs-standard-n95-which-to-consider.pdf

41 https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks

42 https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/respsource3healthcare.html

protection than N95s and have other benefits. An employer with a respiratory protection program can and should provide a loose-fitting or hooded PAPR as a higher standard of protection and as an alternative to N95s or other tight-fitting respirators for those with beards or facial hair.

35. What are KN95s? Are they comparable to N95s? I've heard about nurses having issues with KN95s.

The N95 designation is made by the National Institute for Occupational Safety and Health (NIOSH) in the U.S. NIOSH classifies and certifies different kinds of respiratory protection. A list of all NIOSH-approved filtering facepiece respirators can be found here: https://www.cdc.gov/niosh/npptl/topics/respirators/disp_part/default.html.

NIOSH classifies and certifies different types of respirators by the types of aerosols they protect against:

- The N series are NOT resistant to oil.
- The R series are somewhat resistant to oil.
- The P series are strongly resistant to oil or oil proof.

And by the efficiency of the respirator's filter: The number refers to the particle filtering efficiency.

- A fit-tested properly sealed N95 respirator filters out 95% of airborne particles 0.3 microns or larger,
- An N99 filters out 99%, and
- An N100 filters out 99.97% of particles.

Other countries have different classifications, regulations, standards, and names for their filtering facepiece respirators:

- KN95s are the classification used in China that is considered equivalent to N95s on one or more criteria.
- FFP2 and FFP3 are the classifications used in Europe that are considered equivalent to N95s on one or more criteria.

If N95s are truly unavailable, employers may use respirators that are approved and registered in other countries that meet similar respiratory protection standards to an N95, such as the KN95 or FFP2/3. A list of international non-NIOSH approved respirators that have been issued Emergency Use Authorizations by the FDA can be found here: https://www.fda.gov/media/136403/download.

Non-NIOSH approved respirators from China have their own document: https://www.fda.gov/media/136663/download.

In order for any filtering facepiece respirator to be effective it must be donned correctly and fitted with an appropriate seal to the user's face and the respirator must filter at least 95% of the particles that pass through it. There have been issues with some KN95s not providing an adequate seal if the straps are not constructed to fit around the head, but instead are looser-fitting ear loops. Models with ear-loops instead of elastic head straps will not be able to provide a tight-fitting seal.

In addition, there have been many issues with counterfeit KN95 respirators on the market, including KN95s falsely marketed as NIOSH approved, mis-labeled, and shoddily manufactured. NIOSH has a website dedicated to identifying respirator fraud here: https://www.cdc.gov/niosh/npptl/usernotices/counterfeitResp.html and also has a site with factors to consider if considering purchase a respirator from another country: https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/international-respirator-purchase.html.

36. Is it okay to remove precautions for other patients (MRSA, VRE, TB) to preserve PPE supplies for COVID-19 patients?

Absolutely not — COVID-19 does not make other diseases and infections disappear. Infectious disease precautions and isolation must remain intact for all patients known or suspected to have transmissible diseases. The COVID-19 pandemic is a time to increase protections for patients and staff not degrade our science-based precautions, principles, and practices. Employers have a legal and moral obligation to protect both nurses and patients.

37. My employer has told us to put our N95s in a paper bag between uses. Is this safe?[43, 44, 45]

Many employers have begun to direct nurses to place their N95 respirators in paper bags between uses, often leaving the paper bag for five to seven days before reusing. The CDC has made this recommendation as a "contingency" or "crisis" strategy to conserve PPE supplies. The CDC states that the SARS-CoV-2 virus will die in this timeframe. However, this is an unsafe practice.

There are two main issues with the practice of placing N95s in paper bags and reusing them: risk of contamination and risk of impaired fit and seal. Nurses may not be able to avoid touching contaminated surfaces of the disposable N95 when donning them, and the practice of reuse increases the wearer's risk of exposure to infection each time they don or doff the contaminated respirator given that virus may be present on the interior, exterior, straps, nose bridge, and paper bag.

Given the research that the SARS-CoV-2 virus can survive on surfaces for days, there is not evidence to support the idea that leaving contaminated N95s in a paper bag for a certain number of days will successfully decontaminate or inactive virus or viral particles that may be trapped in the layers of an N95 or living on its surface.

In addition to the lack of evidence to support paper bags as a decontamination method, additional risks from reuse include degradation of the straps with multiple uses; mis-shaping and degraded fit factor over the course of multiple uses; and increased potential for fomite transmission.

38. Is it safe to reuse other PPE, such as gowns and gloves?

Single-use personal protective equipment (PPE) should be used only once and discarded. This kind of PPE is not designed to be reused or to be decontaminated safely.

In addition, basic isolation gowns, as recommended by the CDC, are insufficient protection because they leave parts of the health care worker's skin and clothing vulnerable to exposure contact (direct/indirect), droplet, and aerosol transmission. A recent study found that after doffing PPE (gloves, face mask, and gown), 21% of bare hand samples, 11% of scrub samples, and 7% of face samples showed contamination with viral particles matching the infected patient receiving care. Additionally, isolation gowns may not meet standards for preventing viral penetration (ASTM F1671/ISO 16604 or similar).

39. What should I do if it is hard to breathe or I experience other symptoms while wearing an N95?

Prolonged use of any sort of PPE is physiologically taxing. It will be difficult to wear any PPE for several hours regardless of fit type, which is why increased staffing to allow for frequent breaks are so important. Wearing an N95 for prolonged periods of time may cause increased heart and respiratory rates, heat stress, build-up and absorption of CO2, fatigue, headache, lightheadedness, and skin breakdown. Because of this, it's very important to have additional rest and meal breaks for hydration and to decrease the extra fatigue associated with breathing through the respirator.

Some people may not be able to tolerate wearing a tight-fitting respirator, which is why annual fit-testing is part of OSHA's respiratory protection standards. Part of fit-testing includes ensuring that someone is medically cleared to tolerate the specific make and model of respirator they will use while working. Generally speaking, there are two types of air-purifying respirators: positive pressure and negative pressure. N95 respirators are negative pressure, meaning that the wearer must do the work of inhaling and drawing particles in through the respirator in order to obtain the filtration of particulates in the air. In contrast, PAPRs are positive pressure — with forced air — meaning that the machine does the work of filtering the air, not the wearer.

If someone is experiencing difficulty breathing, headache, or chest tightness, they should be able to take a break and remove the respirator. They may need to have vital signs taken and/or seek medical attention if symptoms are severe or do not improve. One way to decrease the physical stress of wearing a respirator

43 Roberge et al., *Journal of Occupational and Environmental Hygiene*, 2012, 9(8): 517-23.

44 Bergman et al., *American Journal of Infection Control*, 2012, 40(4): 375-80.

45 Chin et al., *Lancet Microbe*, April 2, 2020.

is for employers to provide PAPRs, which do not require the wearer to exert force in order to filter the air. PAPRs have the additional benefit of being reusable, as opposed to N95s, which were designed for single use and discard.

If your facility is re-using disposable N95s that have been decontaminated with an FDA Emergency Use Authorization (EUA) method such as Batelle, STERIS, or ASP STERRAD, you should document and report any physical signs and symptoms you experience as well as any issues with the respirator immediately to your employer and to the FDA hotline at 1-800-FDA-1088.

Please see more information on decontamination in our issue brief here: https://act.nationalnursesunited.org/page/-/files/graphics/0420_COVI_N95_Decontamination_Alert.pdf and here https://act.nationalnursesunited.org/page/-/files/graphics/0420_Covid19_N95_FAQ.pdf

40. What measures are needed for my employer to re-open procedural and outpatient areas safely?

A health care facility that is re-opening procedural and outpatient areas must be prepared to end all crisis standards of care. This means they must resume optimal standards of care everywhere, including inpatient, procedural, outpatient, and other areas. Any reuse, extended use, decontamination, or other unsafe PPE practices must be ended and full, optimal PPE must be provided to nurses and other health care workers in inpatient, procedural, outpatient, and all other areas.

Hospitals reopening procedural areas should have the following safety precautions in place to prevent transmission of the virus within the facility and to protect nurses and other health care workers from exposure.

- Patients should be screened for active viral infection using a reliable RT-PCR test before or upon arrival at the facility.
- Procedures should be delayed for any patients who test positive, if possible. If not, COVID-positive patients should be cared for in a designated COVID procedural area.
- All patients testing negative should be carefully screened for epidemiological risk factors including, but not limited to ill contacts, international travel, and potential for occupational exposures.
- Facilities should implement measures to limit introduction of the virus to and spread within the facility using the three-zone model and other important protections detailed in NNU's Safety Requirements for Hospitals Reopening Procedural and Outpatient Areas:

  https://act.nationalnursesunited.org/page/-/files/graphics/0520_Covid19_H%26S_HospitalReopeningSafetyRequirements.pdf.

41. Should my employer be limiting PPE use for aerosol-generating procedures only on COVID-patients?

Employer rationing or restricting of personal protective equipment (PPE) for nurses who are caring for suspected or confirmed COVID-19 patients is dangerous. Some employers have dangerously restricted N95 use to only during aerosol-generating procedures performed on COVID patients. The CDC, WHO, state health departments and facilities all have different lists of what constitutes aerosol-generating procedures. Commonly listed procedures include but are not limited to intubation, extubation, manual ventilation, proning, CPAP, BiPAP, bronchoscopy, endoscopy, TEE, nebulizer treatments, sputum induction, and manual resuscitation (CPR).

But we know that patients emit small infectious aerosols when they breathe, talk, laugh, sing, sneeze, or cough. Nurses need respiratory protection during all routine care for COVID-19 patients and PUIs, not just when performing aerosol-generating procedures.

Full, optimal PPE should be provided to all nurses and other healthcare workers providing care to both confirmed and suspected COVID-19 patients. Optimal PPE includes a powered air-purifying respirator (PAPR) and viral-impenetrable coveralls that include both head and shoe covering as well as gloves. Under no circumstances should nurses and other health care workers be provided with less than an N95 respirator plus gowns, gloves, and temporary scrubs.

42. Is the second stage of labor an aerosol-generating procedure?[46]

Labor and delivery nurses are in close contact with laboring patients, who are exerting extreme effort during the second stage of labor and frequently blow out their breath, cough, shout, and vomit. This means that if a patient is infected with SARS-CoV-2, they can be emitting a significant number of infectious particles during the second stage of labor. The second stage of labor should be considered an aerosol-generating procedure. If nurses and other health care workers are not fully protected, then they are at risk of exposure and infection.

Given the increasing evidence that asymptomatic infections are an important part of how SARS-CoV-2 is so easily and rapidly transmitted, all patients should be considered possible COVID-19 patients until definitely ruled out using reliable PCR tests as well as epidemiological and other risk factors.

It is also important to point out that any patient with a SARs-CoV-2 infection may emit significant amounts of infectious particles, regardless of whether an aerosol-generating procedure is being performed. It is important for nurses and other health care workers to have full and optimal PPE and other protections whenever caring for COVID-19 patients or PUIs.

43. Does wearing a face shield on top of a surgical mask provide the same amount of protection as an N95 respirator?

No, face shields on top of a face covering or surgical mask does not provide the same protection as a respirator. While a face shield provides a barrier against splashes of fluid into the eyes and the surgical mask provides basic source control (decreased respiratory droplets emitted by the wearer), neither the shield or mask provide actual respiratory protection through the filtration of air. Only a respirator — such as a N95, PAPR, or other half or full filtering facepiece — provides respiratory protection to prevent transmission of COVID-19. Full PPE should be used for all PUIs and COVID-19 patients.

Please see NNU's FAQ on Reuse of N95 Respirators for more details: https://act.nationalnursesunited.org/page/-/files/graphics/0420_Covid19_N95_FAQ.pdf.

44. Is it okay to wear donated masks such as industrial N95 respirators?

While surgical and industrial N95 respirators share similarities, there are key differences that distinguish the two, (see question 33). Before resorting to wearing industrial N95s, other types of reusable respirators should be considered first, such as powered air-purifying respirators (PAPRs) or elastomeric respirators. In addition to its reusability advantages, both PAPR and full-facepiece, elastomeric respirators provide higher levels of respiratory, eye, and face protection from infectious substances than N95s. Use of certain types of PAPRs also eliminates fit-testing, face seal leakage, and breathing resistance.

45. My employer announced that they are going to decontaminate our N95 respirators so that we can reuse them. Is this safe?

No, it is not safe to decontaminate disposable N95 filtering facepiece respirators. NNU evaluated the available scientific evidence and there is no method that is both safe and effective. See more information at https://act.nationalnursesunited.org/page/-/files/graphics/0320_COVID19_RespiratorReuse.pdf

46. Can I decontaminate my N95 respirator in my oven at home?

No, this is not a safe method to decontaminate a respirator. NNU evaluated the available evidence and determined that there is no safe method to decontaminate an N95 filtering facepiece respirator. There is no evidence that decontaminating an N95 filtering facepiece respirator in a home oven is safe or will effectively decontaminate SARS-CoV-2.

47. What is an AIIR or negative pressure room?

AIIR = airborne infection isolation room.

From the CDC:[47] "Formerly, negative pressure isolation room, an AIIR is a single-occupancy patient-care room used to isolate persons with a suspected or confirmed airborne infectious disease. Environmental

46 Palatnik A, McIntosh JJ. Protecting Labor and Delivery Personnel from COVID-19 during the Second Stage of Labor [published online ahead of print, 2020 Apr 10]. *Am J Perinatol*. 2020;10.1055/s-0040-1709689. doi:10.1055/s-0040-1709689.

47 https://www.cdc.gov/infectioncontrol/guidelines/isolation/glossary.html

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 should 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); ACH = air changes/hour, meaning the air supply within the room is completely turned over/new every 5–10 minutes, 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 (MMWR 2003; 52 [RR-10]; MMWR 1994; 43 [RR-13]). HEPA filter = air filter that removes > 99.97% of particles ≥ 0.3µm (the most penetrating particle size) at a specified flow rate of air."

The door and windows of the room need to be closed at all times except during entry and exit for negative pressure to be maintained. An AIIR room is protective for nurses, health care workers, and patients because air is always flowing into the AIIR—from the hallways and from the ventilation system. Exhaust air from the room either gets sent directly outside or through a HEPA filter. This means that contaminated air does not escape into the hallway or get recirculated throughout the building. This decreases the potential for exposure of other patients, visitors, nurses, and health care workers.

48. What is a HEPA filter? Is adding a HEPA filter unit to a room enough to protect from COVID-19?

High-efficiency particulate air (HEPA) filters are a type of mechanical air filter that is at least 99.97% efficient in capturing dust, pollen, mold, bacteria, and any airborne particles that are 0.3 microns or larger in diameter, at a specified flow rate of air.[48] HEPA filters can be installed in the heating, ventilation, and air conditioning systems in hospital rooms as an additional safety measure to remove infectious particles, such as COVID-19, from the air.

A standalone HEPA filter unit should NOT be used as a substitute for airborne infection isolation or negative pressure rooms.

AIIR (airborne infection isolation rooms) use negative air pressure so that air from adjacent rooms or hallways (cleaner area) flow into isolation rooms (contaminated area) to contain and prevent the spread of infectious particles. Air from the room should either be exhausted directly to the outdoors, away from intake vents, or recirculated through a HEPA filter, with a ventilation rate of at least 12 air changes per hour.[49]

49. How long are the filters in portable HEPA filter units good for?

There are different types of HEPA filters, so the length of time a HEPA filter can be used depends on the type of HEPA filter, how many air changes per hour it performs (ventilation rate of the room), the size of the room, and the maintenance requirements for the model. The employer should provide information about the HEPA filter unit to nurses so that they know how to check if it is working, who to contact for maintenance, how to disinfect it, and other important aspects.

Using a portable HEPA filter unit should only be a temporary measure until an airborne infection isolation room (AIIR) is available. All patients with suspected or confirmed COVID-19 infections should be placed in AIIRs, or units that have been converted to negative pressure.

50. What if a negative pressure room is not available?

If a negative pressure room is not available, the patient with suspected or confirmed COVID-19 should be placed in a single room with a door that can close. A portable HEPA filter unit may be placed in the room to decrease aerosols remaining in the air, as it continually filters particulates out of the air. All staff entering the room should be wearing full PPE (PAPR, coveralls, gloves, temporary scrubs, see question 24). All efforts should be taken to transfer the patient to a negative pressure room at that facility or at another facility, if at all possible.

51. What is safe staffing to provide care to a patient with COVID-19?

Safe staffing to provide care to a patient with suspected or confirmed COVID-19 is, at minimum, 1:1. Additional staff should be provided to improve safety, including a buddy system or observer to assist in

48 https://www.epa.gov/indoor-air-quality-iaq/what-hepa-filter-1.

49 https://www.dir.ca.gov/dosh/dosh_publications/ATD-Guide.pdf

safe PPE donning and doffing. Staffing must be placed to ensure the nurse assigned to the patient with suspected or confirmed COVID-19 can take breaks and get relief as needed. If the patient is a rule out (PUI), then all precautions should be implemented as if the patient is a confirmed case until they are confidently ruled out or discharged.

52. Is my employer required to implement protections for COVID-19?

The federal Occupational Safety and Health Act of 1970 requires that employers shall provide "employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm." This includes COVID-19 exposure in health care facilities.

What hospitals and other health care employers must implement to protect nurses and other health care workers from exposure to COVID-19 (also see question 24):

- Open and continuous communication. Employers must continually inform nurses and other health care workers about any potential exposure to suspected or confirmed COVID-19 case(s).
- Screening protocols to identify patients who may have COVID-19 infections.
- Plans to ensure prompt isolation of patients with suspected or confirmed COVID-19 infections in negative pressure isolation rooms. Suspected or confirmed patients must immediately be identified, isolated, and moved to airborne infection isolation rooms/negative pressure rooms. Methods must be put into effect to limit employee exposure during the time after identification and prior to isolation of the patient(s).
- PPE for nurses and other health care workers providing care to patients with suspected or confirmed COVID-19 infections including **airborne and contact precautions. PPE for COVID-19 must include, at minimum, N95 respirators or higher, isolation gowns, eye protection, and gloves.** Employers must ensure the adequate supply of PPE necessary to reduce worker exposure to COVID-19 in routine operations, foreseeable emergencies, and surge events. OSHA recommends that if N95 respirators are not available, employers should use higher levels of respiratory protection such as N/P/R100s, elastomeric respirators, powered-air purifying respirators, and others.[50]
- A Powered Air-Purifying Respirator (PAPR) with high efficiency particulate air filters must be worn during aerosol generating procedures on suspected or confirmed COVID-19 cases. These procedures include endotracheal intubation, airway suction, tracheostomy, bronchoscopy, administration of nebulized medication, and sputum induction.
- 14 days paid precautionary leave for a nurse or other health care worker who is exposed to COVID-19. The employer must notify the employee in a timely fashion in the event of an exposure to a suspected or confirmed patient(s).
- Exposure incident procedures. Employers must identify, evaluate, and investigate potential worker exposures including the cause and chain of employee/patient transmission. Medical follow-up services must be provided, free of charge, to all exposed employees.

Employers should also implement the following:

- Additional engineering controls to prevent exposure to workers or other patients.
- Consider separate screening areas such as surge tents, fever screening clinics, as well as plans to deal with significant numbers of patients such as overflow areas, and ensure staff are aware of surge plans before implementation.
- Separate waiting areas for patients and visitors with respiratory symptoms to prevent exposures.
- Protocols to protect patients and staff from exposure if a patient with suspected or confirmed COVID-19 must leave an isolation room. There should be a dedicated transport route and routes of entry involving source control for patient, PPE for workers, and environmental cleaning.
- In-person, hands-on training, and education for all nurses and other health care workers regarding PPE and safe donning and doffing practice, maintenance, disinfection, and at minimum annual fit testing for health care workers.
- In-person, hands-on training on all protocols and plans implemented by employer for COVID-19.

50 See page 15 of OSHA's "Guidance on Preparing Workplaces for COVID-19," https://www.osha.gov/Publications/OSHA3990.pdf 16 » National Nurses United » Frequently Asked Questions on COVID-19 Date: 03/23/20

- Minimum 1:1 RN-to-patient staffing with additional staffing to ensure safety, including a buddy or observer system to observe safe donning and doffing of PPE, and to ensure that the nurse assigned to the patient has rest breaks and relief as needed.
- Policies to limit and/or screen visitors to reduce the risk of transmission within the facility.

53. Should the hospitals be providing separate scrubs for RNs taking care of suspected and/or confirmed COVID 19 patients so they are able to decontaminate prior to going home?

Employers should provide hospital-issued temporary scrubs, laundered by the hospitals after each use. Health care workers should also be provided facilities to shower and change before going off duty.

54. What does the Cal/OSHA Aerosol Transmissible Diseases Standard require California hospitals and other health care facilities to do?

The Cal/OSHA Aerosol Transmissible Diseases Standard (ATD Standard) requires hospitals and other health care employers in California to protect nurses and other health care workers from exposure to diseases and pathogens transmitted by aerosols (or fine particles) for which droplet and/or airborne precautions are required. Airborne infectious diseases can be transmitted either through inhalation, hand to face contact, or contact with contaminated items or surfaces. The ATD Standard requires airborne and contact precautions for patients with suspected or confirmed COVID-19.

What the ATD Standard Requires for COVID-19:

- Screening protocols to identify patients who may have COVID-19 infections.
- Open and continuous communication. Employers must continually inform nurses and other health care workers about any potential exposure to suspected or confirmed COVID-19 case(s).
- Plans to ensure prompt isolation of patients with suspected or confirmed COVID-19 infections in negative pressure isolation rooms. Suspected or confirmed patients must immediately be identified, isolated, and moved to airborne infection isolation rooms/negative pressure rooms. Methods must be put into effect to limit employee exposure during the time after identification and prior to isolation of the patient(s).
- Protective PPE for nurses and other health care workers providing care to patients with suspected or confirmed COVID-19 infections including **airborne and contact precautions. PPE for COVID-19 must include, at minimum, N95 respirators or higher, isolation gowns, eye protection, and gloves.** Employers must ensure the adequate supply of PPE necessary to reduce worker exposure to COVID-19 in routine operations, foreseeable emergencies, and surge events.
- A Powered Air-Purifying Respirator (PAPR) with high efficiency particulate air filters must be worn during aerosol generating procedures on suspected or confirmed COVID-19 cases. These procedures include endotracheal intubation, airway suction, tracheostomy, bronchoscopy, and sputum induction.
- Fourteen days paid precautionary leave for a nurse or other health care worker who is exposed to COVID-19. The employer must notify the employee in a timely fashion in the event of an exposure to a suspected or confirmed patient(s).
- Exposure incident procedures. Employers must identify, evaluate, and investigate potential worker exposures including the cause and chain of employee/patient transmission. Medical follow-up services must be provided, free of charge, to all exposed employees.

* See the full Aerosol Transmissible Diseases (ATD) at https://www.dir.ca.gov/title8/5199.html. Cal/OSHA's guidance on COVID-19 is available at https://www.dir.ca.gov/dosh/Coronavirus-info.html.

D. Nurse Exposure to COVID-19

55. What does exposure mean?

Exposure includes any time nurse or other health care worker has contact with a patient with confirmed COVID-19 infection or a PUI that is later confirmed, without one or more pieces of necessary precautions

in place (e.g., full, intact PPE inside negative pressure room). For a PUI who tests positive or is otherwise considered a presumptive case, all exposures that have occurred since the patient arrived at the facility must be identified and followed up on.

When exposure happens, the employer must notify the nurse/health care worker as soon as possible. The nurse/health care worker should be placed on precautionary leave/quarantine (paid) for a minimum of 14 days after exposure.

56. What should happen if a nurse or other health care worker is exposed to a patient with COVID-19?

The CDC guidance currently allows health care facilities to return exposed health care workers to work if they are asymptomatic.[51] This is a dangerous recommendation that will mean more exposures and more transmission of COVID-19.

If a nurse or other health care worker has been exposed to COVID-19, they should be immediately informed and placed on paid quarantine/precautionary leave for a minimum of 14 days. The potential for asymptomatic infections to spread COVID-19 underlines the importance of this precautionary measure (see question 9).

The Cal/OSHA Aerosol Transmissible Diseases Standard requires that employers follow up on occupational exposures to COVID-19 and provide medical evaluation for the exposed worker. If there was potential for transmission of the virus, precautionary leave should be recommended for a minimum of 14 days. This precautionary leave must be paid and the worker should not lose other benefits or seniority during the period of the leave.

57. What if a nurse or other health care worker is exposed to an asymptomatic case?

Should be placed on precautionary leave/quarantine. We know that asymptomatic cases can be infectious. In fact, a recent study indicates that the pre-symptomatic phase/asymptomatic phase may play a significant role in transmission (see question 9).[52]

58. Should immunocompromised nurses or pregnant nurses be caring for COVID-19 patients?

Nurses in high-risk categories for severe illness or outcomes from a COVID-19 infection should not be assigned to take care of patients with suspected or confirmed COVID-19 infections. These high-risk categories include nurses who are pregnant, nurses who are immunocompromised, nurses over 65 years of age, and nurses with comorbidities including diabetes, hypertension, heart disease, and others.

E. Environmental Cleaning

59. How long does SARS-CoV-2 remain viable on surfaces?

SARS-CoV-2 is an emerging coronavirus; we don't yet have full information. But recent studies have found that the virus can survive on surfaces for an extended period of time. One study published recently found that SARSCoV-2 can survive on surfaces of different types (metal, plastic, cardboard) for up to two or three days.[53] Another study found that the virus can survive on different surfaces such as printing and tissue papers, wood, cloth, glass, and plastic up to seven days.[54]

51 "Facilities could consider allowing asymptomatic HCP who have had an exposure to a COVID-19 patient to continue to work after options to improve staffing have been exhausted and in consultation with their occupational health program." https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assesment-hcp.html.

52 https://www.ijidonline.com/article/S1201-9712(20)30119-3/fulltext.

53 Van Doremalen, Neeljte et al. (March 17, 2020), "Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1." *NEJM*, published online at https://www.nejm.org/doi/full/10.1056/NEJMc2004973?query=featured_home.

54 Chin, Alex W H et al. "Stability of SARS-CoV-2 in different environmental conditions," *The Lancet Microbe*, April 2, 2020, https://www.sciencedirect.com/science/article/pii/S2666524720300033?via%3Dihub.

A literature review of studies on other coronaviruses (like SARS and MERS, which are relatively similar to SARS-CoV-2/COVID-19) indicates that those other kinds of coronaviruses can survive on a variety of surface types for up to nine days.[55]

60. What cleaning chemicals/disinfectants are effective against COVID-19?

SARS-CoV-2 is an emerging coronavirus; we don't yet have full information. A literature review of studies on other coronaviruses (like SARS and MERS, which are relatively similar to SARS-CoV-2/COVID-19) indicates that commonly available cleaners like bleach, 62–71% ethanol, and hydrogen peroxide are effective against other coronaviruses. The U.S. Environmental Protection Agency (EPA) publishes a list of disinfectants registered with the EPA for use against SARS-CoV-2/COVID-19.

EPA List N: Disinfectants for Use Against SARS-CoV-2

https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2

61. How long should an isolation room or other room where a patient with suspected or confirmed COVID-19 was cared for be left empty?

After negative pressure rooms/AIIRs or other rooms are used for patients with confirmed or suspected COVID-19, these rooms must be left empty, with the door closed, for a period of time to allow the air in the room to be replaced. This is an important step to preventing exposure to nurses, other health care workers, and other patients. Aerosolized viral particles can stay suspended in the air for a period of time (we don't yet know how long they can remain infectious, so maintaining precautions is important). The room ventilation system—and how quickly the air is replaced—will determine how long the room needs to remain empty. If a health care worker needs to enter the room during this period of time, before the air is completely replaced, then they must wear full PPE.

The CDC recommends that environmental service workers do not enter a room (AIIR or otherwise) that was occupied by a patient with COVID until enough time has elapsed for enough air changes to have removed potentially infectious particles.[56]

55 Kampf, G. et al (Feb 6, 2020), "Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents," *Journal of Hospital Infection*, online at https://www.journalofhospitalinfection.com/article/S0195-6701(20)30046-3/fulltext.

56 See question 3 in the CDC's "Health Care Infection Prevention and Control FAQs for COVID-19," online at https://www.cdc.gov/coronavirus/2019-ncov/infection-control/infection-prevention-control-faq.html.