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Frequently Asked Questions on COVID-19

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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/O220_NNU_HealthSafety_COVID-19_PPE_Report.pdf.

3 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](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(20)30086-4/fulltext).

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 increase 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 responders, 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/O420_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 placed 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.

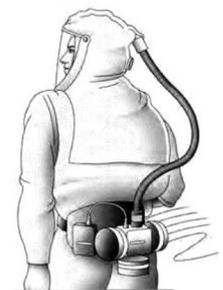
Basic isolation gowns, as recommended by the CDC, are insufficient protection because they leave parts of the health care worker's skin and clothing vulnerable to exposure contact (direct/indirect), droplet, and aerosol transmission. A recent study found that after doffing PPE (gloves, face mask, and 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

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



Hood Powered Air-Purifying Respirator (PAPR)

Figure 1 - PAPR

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, administration 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 inactivate 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 $\geq 0.3\mu\text{m}$ (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

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- › 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](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](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>.