Updated April 18, 2020

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.”

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. 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, aches, fatigue, and shortness of breath. 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. It is common at the beginning of an outbreak to have a case definition and clinical symptoms associated with a new infection change due to this fact that the most severe cases are most easily identified and studied first. Given the growing spread, we can hope to see better epidemiologic studies to more accurately describe the clinical picture.

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 (Table 1).

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.”


The Chinese Centers for Disease Control and Prevention (Chinese CDC) reported recently that approximately 20% of COVID-19 cases are classified as severe or critical.7 COVID-19 infections may result in life-threatening conditions including acute respiratory distress syndrome, acute kidney injury, cardiac injury, and liver dysfunction (Table 2) and may require hospitalization, intensive care, intubation, or other significant life-saving interventions. In some cases COVID-19 may lead to death; the Chinese CDC reported that 2.3% of confirmed COVID-19 cases died.8 The World Health Organization’s reports indicate that 3.4% of reported cases have died.9 There is currently no cure, only supportive treatment, and no vaccine.

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

<table>
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<th>Symptom</th>
<th>Huang et al. (Feb 15-21, 2020), report on 41 admitted hospital patients with laboratory-confirmed COVID-19 infection in Wuhan, Hubei Province, China4</th>
<th>Wang et al. (Feb 20, 2020), report on 105 patients with COVID-19 infections in North Shanghai, China5</th>
<th>Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies6</th>
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<tr>
<td>Fever</td>
<td>98%</td>
<td>82.9%</td>
<td>89%</td>
</tr>
<tr>
<td>Cough</td>
<td>85%</td>
<td>62.9%</td>
<td>63%</td>
</tr>
<tr>
<td>Fatigue or weakness</td>
<td>44%</td>
<td>17.1%</td>
<td>51%</td>
</tr>
<tr>
<td>Headache</td>
<td>8%</td>
<td>Muscle soreness 6.7%</td>
<td>8%</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>3%</td>
<td>8.6%</td>
<td>7%</td>
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The Chinese Centers for Disease Control and Prevention (Chinese CDC) reported recently that approximately 20% of COVID-19 cases are classified as severe or critical.7 COVID-19 infections may result in life-threatening conditions including acute respiratory distress syndrome, acute kidney injury, cardiac injury, and liver dysfunction (Table 2) and may require hospitalization, intensive care, intubation, or other significant life-saving interventions. In some cases COVID-19 may lead to death; the Chinese CDC reported that 2.3% of confirmed COVID-19 cases died.8 The World Health Organization’s reports indicate that 3.4% of reported cases have died.9 There is currently no cure, only supportive treatment, and no vaccine.

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8 Wu, Zunyou and Jennifer M. McGoogan (Feb 24, 2020).

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

We are still learning about COVID-19. Someone is exposed to COVID-19 and the virus begins to multiply in their body. It sets up shop primarily in their nose, throat, and lungs and as it multiplies people may begin to feel symptoms. Currently available evidence indicates that it takes an average of 4 or 5 days for the virus to “incubate” before people start to feel symptoms of infection. However, that incubation period has a wide range and can be a matter of hours to up to a few days to over 3 weeks. However, most experts have been reporting that this incubation period is about 1–14 days.

The current data based on the biggest epidemiologic studies we have from China is that somewhere around 20% of people will have moderate to severe COVID-19 that requires hospitalization. For the majority of people, ~80%, infection will mean mild cold or flu-like symptoms. However, for those 20% of people who will need greater medical care and hospitalization, 10-30% of them may need intensive care.

When the virus infects the body, it causes an inflammatory response. As the virus infects the lungs, it often causes a pneumonia, which is a lung infection where the alveoli—small air sacs of the lung—fill with fluid and may become solid. Severe pneumonia can lead to ARDS (acute respiratory distress syndrome), which is a rapidly progressive critical illness in which the fluid in the lungs prevents sufficient oxygen from entering the blood. ARDS usually requires mechanical ventilation and intensive care. The infection in the lungs can become severe enough to travel to the blood and cause sepsis. Lack of oxygenation combined with infection can affect all other major organ systems and cause multi-organ system failure, septic shock, and death.

There have been different case mortality rates reported based on country, and this will continue to change as more people are tested. However, estimates hover around 2%, with a range of 1–5% of people with the infection may die. This estimate, again, is skewed toward the worst-case scenario, as we have only been screening for the worst cases—e.g. the people who already have symptoms and need additional medical care.

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

<table>
<thead>
<tr>
<th>Clinical progression/outcome</th>
<th>Yang et al. (Feb 24, 2020), report on 52 critically ill patients with COVID-19 who were admitted to an intensive care unit (ICU) in Wuhan, China(^\text{10})</th>
<th>Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies(^\text{11})</th>
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<tr>
<td>Acute respiratory distress syndrome</td>
<td>67%</td>
<td>12%</td>
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<tr>
<td>Acute kidney injury</td>
<td>29%</td>
<td>2%</td>
</tr>
<tr>
<td>Cardiac injury</td>
<td>23%</td>
<td>3%</td>
</tr>
<tr>
<td>Liver dysfunction</td>
<td>29%</td>
<td>—</td>
</tr>
<tr>
<td>Death</td>
<td>61.5% at 28 days</td>
<td>8%</td>
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\(^{11}\) Liang, Bo et al. (Feb 28, 2020).
We do know that the case fatality rate—percent of people infected who die—is much higher for people who are older. Data from China of over 44,000 cases indicates that the case fatality rate doubles with about every 10 years of age past age 60, e.g. 4% for 60-70 year olds, 8% for 70-80 year olds, and around 15% for 80+ year olds. We also know that pre-existing conditions puts people at higher risk of severe disease—such as diabetes, hypertension, heart disease, lung disease, cancer. We don’t have enough data to be able to stratify and compare the risks between these groups at this time.

5. Can young adults (<65 years) be infected with COVID-19? Are these infections always mild?
Yes, young adults (18-40) can be infected with COVID-19. While the majority of infections among younger adults may be mild, severe illness and death can occur. Data from the U.S. indicates that as of March 16, 2020, a total of 4,226 cases had been reported. Among the 2,449 patients with known age, 29% were aged 20-44 years. Of those admitted to an ICU, 12% were aged 20-44 years. 20% of deaths were aged 20 to 64 years.12

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.
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 3 hours.\(^{13}\)

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?**

- Asymptomatic infections are definitely occurring and they are definitely infectious.
- In fact, two studies that came out in early March 2020 indicate that the most infectious period may actually be the first 4 days or so after exposure; pre-symptom development.
- There is also little data about how long it takes for someone to stop being infectious after they clinically improve (e.g. they no longer have a cough, fever, or symptoms).

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.

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12. Can children get infected with COVID-19?

Children can be infected; they just seem to have a milder illness that’s 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.14

13. 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.

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.

14. 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-19.15

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.

15. 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.

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15 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
B. Understanding Testing for COVID-19

16. 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. 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. 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. 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. 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. 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.

17. What about testing expansion to private labs?
The CDC and FDA have recently allowed expansion of testing into local public health labs and other clinical labs (such as at a hospital) in addition to state public health labs. Yet, there is no still widespread availability to date.

18. What is the process for patients to be tested?
The CDC changed their screening criteria on March 4 to allow any clinician to use their judgment to determine whether a test for COVID-19 is appropriate for a particular patient. The CDC strongly encourages clinicians to test for other causes of respiratory illness, such as influenza, before or in addition to a test for COVID-19. On March 9, the CDC changed their guidance to encourage prioritization of testing for the following three groups: hospitalized patients with signs and symptoms compatible with COVID-19; symptomatic individuals in “high risk groups” including older adults and individuals with immunocompromised status or chronic medical conditions; and any individual who has had close contact with a confirmed COVID-19 patient or who has travel history to an impacted region (listed on the CDC’s website) within 14 days of symptom onset. Check the CDC website for the most up-to-date screening criteria as it may have changed: https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-criteria.html. Currently, the CDC recommends only testing individuals who have developed symptoms matching COVID-19. This is a problem because we don’t actually know the extent of asymptomatic infections. For example, on the Princess Diamond cruise ship in Japan, about half of the passengers who tested positive for COVID-19 did not have any symptoms at the time.

16  https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations
21  https://emergency.cdc.gov/han/2020/han00429.asp
19. **What should testing look like? Are there issues with the CDC guidance on testing?**

The CDC’s guidance recommends testing for symptomatic people, with a focus on hospitalized and severely ill patients first. Though it is important to test people who are already ill, we should also be prioritizing testing for anyone who may have history of exposure, particularly health care workers and close contacts. There should also be widespread testing and sampling of the population—as this will be the best tool to inform us of what community risk looks like. In order for this to happen, we need to rapidly ramp up community screening and recognize the widespread community transmission that is likely happening.

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

The test for COVID-19 is an RT-PCR test (reverse transcription-polymerase chain reaction test). It tells you whether there are enough viral particles present in a sample to register as a positive result. The COVID-19 test is not a serological test, which tests whether a person has developed an immune response to a pathogen.

All the COVID-19 test is able to detect is if viral particles are present in an individuals’ body/bodily fluids (for COVID-19, usually throat and nose swabs are taken, sometimes sputum samples from deeper in the lungs). And the CDC has not yet released the necessary information (sensitivity and specificity) for us to understand how well this test works. We do not yet know how often the test gives us false positives or, much more dangerous, false negatives.

21. **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.\(^{22}\) A news article reports that a patient in Texas tested negative twice before a third test later recorded a positive result.\(^{23}\)

2. A more protective way to implement precautions is to use the nurses’ precautionary case definition, based on the precautionary principle. Given that the test is not a perfect tool (and that we don’t even have the data to understand how good it is), we should be implementing precautions for more patients rather than waiting for positive test results.

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

All protections (see next question) should be implemented for any probable or confirmed COVID-19 case. This also means that precautionary leave (minimum of 14 days) should be implemented for any nurse exposed to a probable or confirmed COVID-19 case.

Who should be considered a suspected, probable, or confirmed case:

- **Suspected:** Any patient with symptoms of respiratory illness should be considered a suspected COVID-19 case.

- **Probable:** If the patient tests negative for influenza and other respiratory viruses, s/he should be considered a probable COVID-19 case.

- **Probable:** If the patient has clinical symptoms that match the characteristics of COVID-19 cases, s/he should be considered a probable COVID-19 case regardless of test results.

- **Confirmed:** If the patient tests positive for COVID-19.

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C. Protections for Nurses and Other Health Care Workers

22. 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.

23. 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 #24-27).

24. 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.
25. 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. 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.

26. 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).

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 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.

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.

Reuse of N95 respirators poses an additional exposure hazard.

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

From the FDA website:
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.

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.

From the Occupational Safety and Health Administration (OSHA) website:
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.

28. Is reusing N95 masks okay?

No, reusing N95 masks is not okay. N95 masks should never be reused for a pathogen where contact precautions are needed, including COVID-19. Reusing or extended use of N95 masks should only be employed as last resort measure. If reusing N95 masks 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 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.

OSHA recommends:
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).

29. 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, administering 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.

30. 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.\footnote{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.\footnote{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}

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

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

<table>
<thead>
<tr>
<th>Table 3: Differences Between Industrial and Medical N95s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SURGICAL/MEDICAL N95 RESPIRATORS</strong>, commonly used in health care settings\footnote{<a href="https://multimedia.3m.com/mws/media/1794572O/surgical-n95-vs-standard-n95-which-to-consider.pdf%7D">https://multimedia.3m.com/mws/media/1794572O/surgical-n95-vs-standard-n95-which-to-consider.pdf}</a></td>
</tr>
<tr>
<td>Both are NIOSH-certified to filter at least 95% of non-oily particles that are 0.3 µm in diameter</td>
</tr>
<tr>
<td>Both are cleared by the FDA as a medical device</td>
</tr>
<tr>
<td>Both require annual fit-testing and training AND user seal check before each use to ensure proper fit</td>
</tr>
<tr>
<td>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.</td>
</tr>
<tr>
<td>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.\footnote{<a href="https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks%7D">https://www.fda.gov/medical-devices/personal-protective-equipment-infection-control/n95-respirators-and-surgical-masks-face-masks}</a></td>
</tr>
</tbody>
</table>
32. 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 31). 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.

33. 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

34. 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.

35. What is an AIIR or negative pressure room?

AIIR = airborne infection isolation room.

From the CDC: “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 factors are controlled in AIIRs to minimize the transmission of infectious agents that are usually transmitted from person to person by droplet nuclei associated with coughing or aerosolization of contaminated fluids. “AIIRs should provide negative pressure in the room (so that air flows under the door gap into the room); and an air flow rate of 6-12 ACH (6 ACH for existing structures, 12 ACH for new construction or renovation); ACH = air changes/hour, meaning the air supply within the room is completely turned over/new every 5–10 minutes, and direct exhaust of air from the room to the outside of the building or recirculation of air through a HEPA filter before returning to circulation (MMWR 2003; 52 [RR-10]; MMWR 1994; 43 [RR-13]). HEPA filter = air filter that removes > 99.97% of particles ≥ 0.3µm (the most penetrating particle size) at a specified flow rate of air.”

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

36. 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. 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.

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

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

37. 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.  

38. 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 Questions 23 and 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.  

39. 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 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.  

40. 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 22):  
- 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.39

- 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.
- 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.

**41. 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.

**42. 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.

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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.

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.

* 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

43. 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.

44. 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.\(^{40}\) 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.

45. 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).\(^ {41}\)

46. 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.

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\(^{40}\) “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

\(^{41}\) https://www.ijidonline.com/article/S1201-9712(20)30119-3/fulltext
E. Environmental Cleaning

47. How long does virus remain viable on surfaces?

Unclear, this is a new virus and we don’t have that info yet. One study published recently found that SARS-CoV-2 can survive on different surfaces for up to 2 or 3 days. 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 9 days.

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

Unclear, this is a new virus and we don’t have that info yet. 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. See this list at https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2.

49. 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.

