

Updated March 19, 2020

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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, 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.

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

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

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).

Table 1: Symptoms of COVID-19 Reported in the Scientific Literature			
Symptom	Huang et al. (Feb 15-21, 2020), report on 41 admitted hospital patients with laboratory-confirmed COVID-19 infection in Wuhan, Hubei Province, China ³	Wang et al. (Feb 20, 2020), report on 105 patients with COVID-19 infections in North Shanghai, China ⁴	Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies ⁵
Fever	98%	82.9%	89%
Cough	85%	62.9%	63%
Fatigue or weakness	44%	17.1%	51%
Headache	8%	Muscle soreness 6.7%	8%
Diarrhea	3%	8.6%	7%

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.”⁶

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

3 Huang et al. (Feb 15-21 2020), “Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China.” *The Lancet*, 395(10223): 497-506.

4 Wang, Changhui, et al. (Feb 20, 2020), “The Epidemiologic and Clinical Features of Suspected and Confirmed Cases of Imported 2019 Novel Coronavirus Pneumonia in North Shanghai, China.” Preprints with *The Lancet*, published online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3541125.

5 Liang, Bo et al. (Feb 28, 2020), “Clinical Characteristics of 457 Cases with Coronavirus Disease 2019.” Preprints with *The Lancet*, published online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3543581.

6 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).

7 Wu, Zunyou and Jennifer M. McGoogan (Feb 24, 2020), “Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention.” *JAMA*, published online at <https://jamanetwork.com/journals/jama/fullarticle/2762130>.

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

Clinical progression/ outcome	Yang et al. (Feb 24, 2020), report on 52 critically ill patients with COVID-19 who were admitted to an intensive care unit (ICU) in Wuhan, China ¹⁰	Liang et al. (Feb 28, 2020), report on 457 patients with lab-confirmed COVID-19 identified from 7 studies ¹¹
Acute respiratory distress syndrome	67%	12%
Acute kidney injury	29%	2%
Cardiac injury	23%	3%
Liver dysfunction	29%	-
Death	61.5% at 28 days	8%

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

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

9 The World Health Organization’s Situation Report from March 4, 2020 indicates that 2,984 deaths have been reported in China and 214 deaths have been reported outside of China for a total of 3,198 deaths. $3,198 \text{ deaths} \div 93,090 \text{ total cases} = 3.4\%$. World Health Organization (March 4, 2020), “Coronavirus disease 2019 (COVID-19), Situation Report-44.” Online at https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200304-sitrep-44-covid-19.pdf?sfvrsn=783b4c9d_6.

10 Yang, Xiaobo et al. (Feb 24, 2020), “Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study.” *The Lancet Respiratory Medicine*, published online, [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30079-5/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30079-5/fulltext).

11 Liang, Bo et al. (Feb 28, 2020).

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 however 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.

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. 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

6. 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

7. 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.¹²

Droplet precautions only protect you from what can be projected directly on to your face, you, or a surface, any of the smaller particles 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 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 personal protective equipment (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.

8. 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).

9. When will a vaccine be available?

In 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.

¹² 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.

10. 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.

11. Can children get infected with COVID-19?

Children can be infected; they just seem to have milder illness to harder to identify. A study published March 3 showed 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 important part of transmission through families.¹³

12. 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.

13. 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 manufacturer's claims that they are effective against COVID-19.¹⁴

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.

¹³ 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.

¹⁴ 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

14. 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.¹⁵

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.¹⁶

But testing capacity has still been limited. The CDC reported on March 9 that they expect soon the US will have capacity to test 75,000 people.¹⁷ 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.¹⁸

Further, 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-19.¹⁹ 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.

15. What about testing expansion to private labs?

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.²⁰ Yet, there is no still widespread availability to date.

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

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

15 <https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations>

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

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

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

19 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>.

20 <https://emergency.cdc.gov/han/2020/han00429.asp>

have travel history to an impacted region (listed on 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.

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

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.

18. 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 individual's 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.

19. 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.²¹ A news article reports that a patient in Texas tested negative twice before a third test later recorded a positive result.²²
- 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.

21 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>.

22 <https://thehill.com/changing-america/well-being/prevention-cures/485425-coronavirus-patient-in-san-antonio-mistakenly>

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.

C. Protections for Nurses and Other Health Care Workers

20. 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>.

21. 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 don't know about transmission still. There is no clear or decisive evidence to confirm or deny transmission pathways (see Questions #6 and #22-25).

22. 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 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.

23. 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.²³ 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.

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



Hood Powered Air-Purifying Respirator (PAPR)

Figure 1 - PAPR

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).²⁴

Respiratory and eye protection are necessary elements of protection for COVID-19 (also see Questions #6 and 7). 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

23 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.

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

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.²⁵

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.²⁶ Reuse of N95 respirators poses an additional exposure hazard.

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

From the FDA website:²⁷

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:²⁸

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.

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

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

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

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

26. 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, then must be under nurse's professional judgment and not a blanket instruction to reuse x many times or for x many shifts. Using a 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:²⁹

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: a R/P95, N/R/P99, or N/R/P100 filtering facepiece respirator; an air-purifying elastomeric (e.g., half-face or full-face) respirator with appropriate filters or cartridges; powered air purifying respirator (PAPR) with high-efficiency particulate arrestance (HEPA) filter; or supplied air respirator (SAR).

27. What is an AIIR or negative pressure room?

AIIR = airborne infection isolation room.

From the CDC:³⁰ “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 $\geq 0.3\mu\text{m}$ (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.

28. 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 #21 and 22). 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.

²⁹ See page 15 of OSHA's Guidance on Preparing Workplaces for COVID-19, <https://www.osha.gov/Publications/OSHA3990.pdf>.

³⁰ <https://www.cdc.gov/infectioncontrol/guidelines/isolation/glossary.html>

29. 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.

30. 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 #20):

- › 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).
- › 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. 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.³¹
- › 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:

- › Implement 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

³¹ See page 15 of OSHA's "Guidance on Preparing Workplaces for COVID-19," <https://www.osha.gov/Publications/OSHA3990.pdf>

with significant numbers of patients such as overflow areas and ensure staff are aware of surge plans before implementation.

- › Implement separate waiting areas for patients and visitors with respiratory symptoms to prevent exposures.
- › Implement 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.

31. 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.
- › 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).

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- › 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

32. 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.

33. 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.³² 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 #8).

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.

34. 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, recent study indicates that the pre-symptomatic phase/asymptomatic phase may play a significant role in transmission (see Question #8).³³

32 “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>

33 [https://www.ijidonline.com/article/S1201-9712\(20\)30119-3/fulltext](https://www.ijidonline.com/article/S1201-9712(20)30119-3/fulltext)

E. Environmental Cleaning

35. 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.³⁴

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.³⁵

36. 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>.

37. 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.³⁶

34 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.

35 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).

36 See question 3 in 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>.