

COVID-19 FACT SHEET

RESPIRATORY

PROTECTION (MASKS)

O C H U

ONTARIO COUNCIL OF HOSPITAL UNIONS

CUPE

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My employer is telling me that, besides wearing a face shield or goggles, a gown, and gloves, I am safe looking after a COVID-19 patient wearing a surgical mask—the same one for several hours or even a full shift. Am I really properly protected?

What the evidence shows is that the answer is **NO**.

Engineering controls (such as barriers and isolation rooms) and administrative controls (such as judicious placement of patients and staff) must be put into place. Personal protective equipment (PPE) offers another important layer of protection. There are differences between the various types, especially masks and respirators.

- **Surgical, medical, procedure masks** are loose fitting and may let contaminants in through the open sides. Surgical masks provide some protection against splashes and droplets, but face shields are also needed if you are working with or near a confirmed or suspected COVID-19 patient. *“Medical masks are made from a wide range of materials, and studies have found a wide range of filter efficiency (2% to 98%), with most exhibiting 30% to 50% efficiency ... surgical masks offer very low levels of protection for the wearer from aerosol inhalation.”* (Brosseau and Sietsema, 2020a)
- **Disposable medical N95 respirators**, properly fit tested, are designed to provide better protection than surgical masks, and filter 95% of sub-micron particles. Again, a face shield is needed to protect your eyes and face. *“The N95 designation means the filter exhibits at least 95% efficiency in the least efficient particle size range [smallest particles]...N95 FFRs [filtering facepiece respirators] offer superior protection from inhalable infectious aerosols likely to be encountered when caring for suspected or confirmed COVID-19 patients.”* (Brosseau and Sietsema, 2020a) Public Health Ontario has advised that, in light of the shortage of medical N95s, other types of NIOSH approved respirators can be used, including those with *“certifications that provide protection from the SARS-CoV-2 virus, which includes: N99, N100, R95, R99, R100, P95, P99, P100.”* (Public Health Ontario, 2020a) Disposable N95s should be seen as the **minimum** protection for caring for suspect and confirmed COVID-19 cases.
- **Elastomeric respirators** (synthetic or rubber half-mask and full facepiece air purifying respirators) have replaceable filter cartridges. *“Most healthcare workers are aware of the N95 respirator but may not be aware that the re-formable, reusable elastomeric respirators are a viable option for respiratory protection...They are a cost-efficient and sustainable alternative when the demand for disposable respirators is excessive.”* (CDC, 2017) They require fit testing and provide good protection. They have the added advantage of being able to be repeatedly cleaned, disinfected and reused.
- **Powered air-purifying respirators (PAPR)** provide an even greater level of protection. When dealing with a disease as serious as COVID-19, it is not unreasonable to expect maximum protection. *“The precautionary principle supports higher levels of respiratory protection, such as powered air-purifying respirators [PAPRs], for aerosol-generating procedures such as intubation, bronchoscopy, and acquiring respiratory specimens.”* (Brosseau and Sietsema, 2020a)

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Under normal, non-crisis circumstances, reusing a surgical or N95 mask would be unheard of, partly because of the risks involved in donning and doffing potentially contaminated PPE. The change in protocol, which now requires some health care workers to continue using the same mask for an extended period of time, is directly related to the shortage of replacements.

A mask that is wet or soiled may become less effective and should be discarded. There are discussions taking place currently about procedures for cleaning and sterilizing used N95s but there is concern that the masks may become less effective with use, the sterilization process itself, and re-deployment. (CDC, 2020; Lowe, 2020; Bensadoun, 2020; Brosseau and Sietsema, 2020b)

Q What do government agencies recommend?

In Ontario, guidelines require that N95 masks, face shields, gowns, and gloves, be used by health care workers during such aerosolizing procedures as endotracheal intubation, resuscitation, BIPAP, CPAP, airway suctioning, bronchoscopy, high flow oxygen, sputum induction, surgery and autopsy. (Public Health Ontario, 2020b)

N95s must be fit tested. They cannot be safely worn when there is facial hair (beards). They are also not recommended for those with breathing difficulties.

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According to Public Health Ontario, during other room care for patients, including housekeeping, surgical or procedure masks, eye protection, isolation gowns, and gloves are to be worn. According to Public Health Ontario (2020b), those performing screening and other duties are not required to have any PPE unless they are within two metres of the possible or confirmed case. There are scientists and other regulatory agencies that would disagree that maintaining this distance offers enough protection.

The California Occupational Safety and Health Administration (Cal/OSHA) originally ordered strict guidelines saying that N95s should be used by all health care workers potentially coming into contact with a case. They further advised that PAPRs should be used for any aerosolizing procedures. Cal/OSHA warned that:

“Surgical and other non-respirator face masks do not protect persons from airborne infectious disease and cannot be relied upon for novel pathogens. They do not prevent inhalation of virus particles because they do not seal to the person’s face and are not tested to the filtration efficiencies of respirators. Surgical and face masks must not be used instead of an approved respirator such as an N95 mask.” (Cal/OSHA, 2020a)

Q Why am I not being provided with an N95?

There is a global shortage of personal protective equipment (PPE), especially N95s and it has been argued the shortage is influencing policy. (Soucheray, 2020) Up until early March, 2020 the US Centre for Disease Control and Prevention (CDC, 2020b) was recommending that all health care workers potentially coming into contact with COVID-19 patients be provided with an N95 respirator.

Protections are being compromised due to shortages.

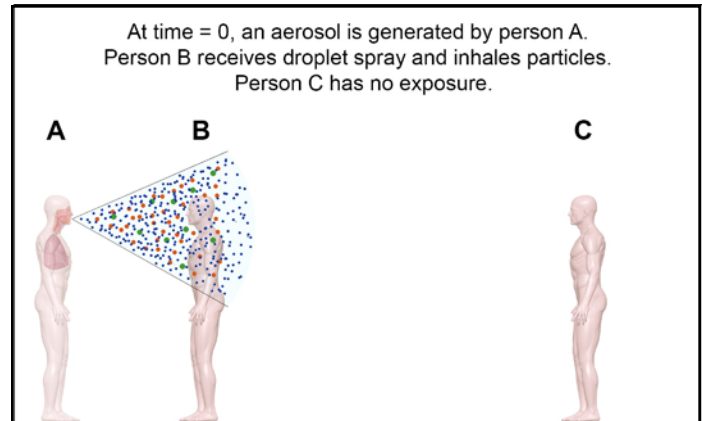
The agency changed its guidelines because of severe shortages of N95s and now recommends surgical masks for non-aerosolizing care. On March 28, 2020, Cal/OSHA too weakened its guidelines due to PPE shortages. (Cal/OSHA, 2020b) In other words, protections are being compromised due to shortages. These are supply-based, rather than science-based, decisions.

An expert on respiratory protection for infectious disease from the University of Illinois, said that, in light of recent scientific findings, *“Healthcare organizations must return to using respirators for confirmed and suspected COVID-19 patients when supply chain problems are resolved.”* (Brosseau, 2020)

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Am I safe if I maintain a distance of two metres from a suspected or confirmed COVID-19 patient?

Health care workers have also been assured that maintaining a distance of two metres (or about six feet) is protection enough. **There really is no solid evidence that two metres is actually a safe distance, especially if the patient isn't wearing a mask.** Although risks increase with duration of exposure, transmission can take place in an instant by being directly coughed on by an infected person. Recent research in China found the COVID-19 virus travelled up to four metres in the air from hospitalized patients. (Guo, et al., 2020) Laboratory experiments have determined that coughing and sneezing can transmit droplets several metres— up to 27 feet in one study (Bourouiba, 2016).

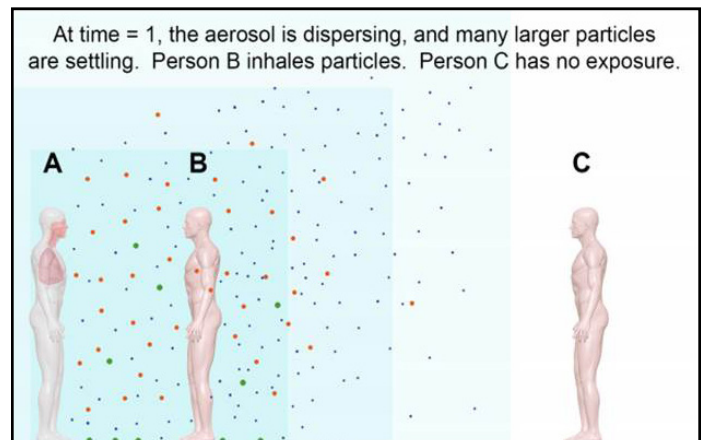


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Is COVID-19 airborne?

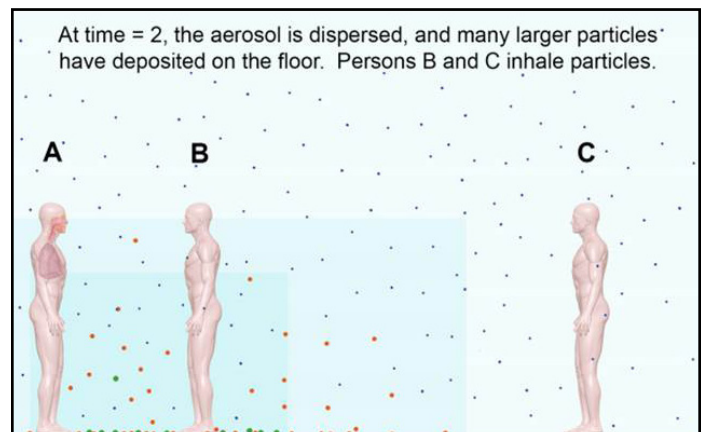
A burning question, still largely unanswered, is how the virus is so readily transmitted. It has been well established that it can be carried in droplets—large or small. Aerosolizing procedures, such as intubation, can release infected droplets into the air.

A troublesome and ongoing debate that has a direct impact on health care workers is whether or not COVID-19 can be transmitted through “airborne” particles or become “aerosolized” simply through coughing, sneezing, or even just breathing.



Over the past several weeks, the evidence has grown that COVID-19 can become airborne. (Santarpia, et al., 2020; Ong SWX, et al., 2020; Lockerd Maragakis, 2020) Yet many health officials, including those making decisions about worker protection in the province of Ontario, continue to contend that the pathogen is only transmitted through droplets and contact. (Public Health Ontario, 2020b)

Another very significant concern is that numerous studies have concluded that COVID-19 can be spread before it causes symptoms—in other words, coughing and sneezing do not have to be present for the virus to be transmitted. Just breathing might be enough. (Van Beusekom, 2020) Some researchers and agencies recommend, based on several studies regarding the increasing evidence of the airborne transmissibility of COVID-19, that health care workers be provided with respirators, such as N95s, or, better yet, PAPRs. (Chang, et al., 2020; ECDC, 2020)



Illustrations courtesy of CIDRAP and Absolute Science Illustration.

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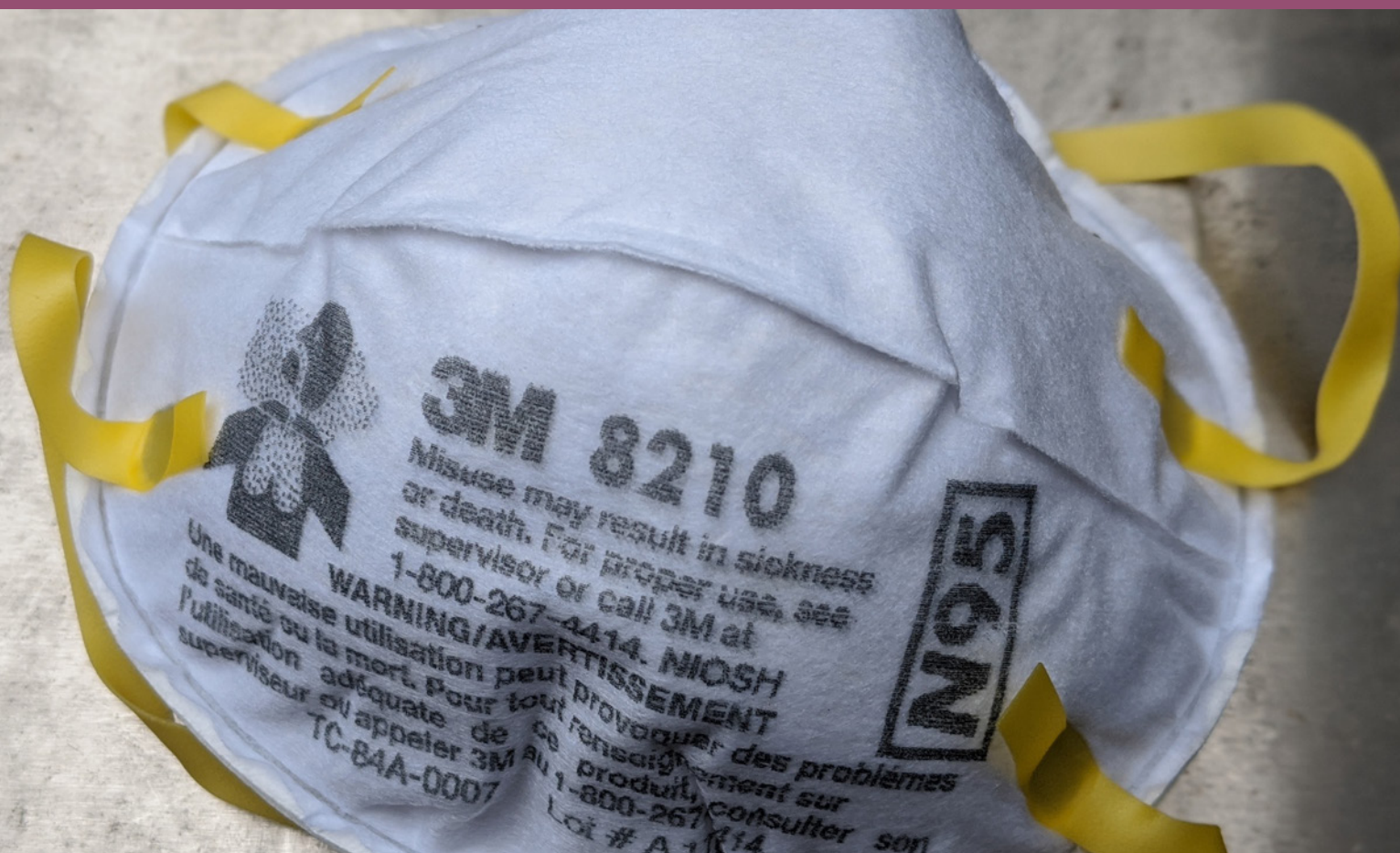
What should the health care system be doing to protect health care workers?

The SARS Commission, which examined how the Ontario health care system responded to the 2003 outbreak of Severe Acute Respiratory Syndrome (SARS), emphasized the importance of following the *Precautionary Principle*, which states, “Where there is reasonable evidence of an impending threat to public harm, it is inappropriate to require proof of causation beyond a reasonable doubt before taking steps to avert the threat...that reasonable efforts to reduce risk need not await scientific proof.”

The Commission further recommended that all workplace parties be involved in planning for any future pandemics and to be prepared with adequate supplies and capacities. It emphasized the importance of “listening to front line health workers.” It stated: “That in any future infectious disease crisis, directives involving worker safety be prepared with input from the workplace parties who have to implement them, including employers, health worker representatives and Joint Health and Safety Committees.” (SARS Commission, 2006)

The Commission stated that N95s provided needed protection for health care workers and should be available in sufficient quantities should a similar outbreak occur. Ontario followed the recommendation to purchase and store N95s and other medical supplies. 55 million N95s were purchased— but, unfortunately the government disposed of most of them in 2013 after their expiry dates were reached— and they were not replaced. (DiManno, 2020)

The bottom line is that adequate respiratory protection is critical for health care worker safety—and for public health. It is important to continue to demand optimal PPE (N95s and PAPRs), and not to just accept the more readily available but less effective surgical masks. Supplies of N95s and PAPRs must be increased and worker protection given the highest priority—for the sake of those taking care of patients and for the community as a whole.



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