



April 9, 2020

COVID-19 and Personal Protective Equipment

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In these unprecedented and uncertain times, there is understandable concern and confusion among many regarding the mechanisms by which COVID-19 may be spread and how best to keep everyone safe. Unfortunately, misinformation abounds, particularly across social media, where sources may be unvetted and the most sensational headlines are the ones most likely to grab readers' attention.

Such is the case regarding airborne transmission of COVID-19. Panic about how best to keep one's self and family safe has led to stockpiling of personal protective equipment (PPE) by members of the general public. Unfortunately, this leaves those at greatest risk for contracting COVID-19—front-line healthcare workers involved in aerosol-generating medical procedures (AGMPs)—at heightened risk of contracting the virus and unwittingly spreading it to other patients while they are still asymptomatic.

It is essential that everyone—healthcare providers and the general public—be provided with the best available information to date regarding how COVID-19 is transmitted and how to reduce the risk of transmission. The reality is that PPE, such as N95 respirators, needs to be used judiciously given the global demand for such devices. Evidence-informed decision-making is crucial in order to minimize potential harms.

It is important to be clear about the difference between aerosols and droplets, and the relative risks posed by each with respect to potential transmission of the virus. Droplets are >5 microns (>0.01 mm) in diameter; aerosols are smaller.¹ Droplets are the types of particles produced when someone coughs, and can be spread up to 1 metre in distance.

The best evidence to date indicates that COVID-19 is primarily transmitted via droplets or contact routes (e.g., physical contact, touching surfaces recently touched by someone infected with the virus). Physical distancing of 2 m (to allow for a buffer zone), frequent handwashing, and regular sanitizing of common surfaces is the best way for members of the public to reduce the risk of contracting the virus. Those who must be in closer physical proximity to patients who may be carriers of the virus are at increased risk of transmission via droplets. Standard droplet precautions are the preferred method to minimize the transmission of COVID-19 in all situations except aerosol generating medical procedures. Standard droplet precautions include, for routine care for patients with (COVID-19) (both suspected or confirmed cases), PPE should consist of gloves, gown, facial protection and a procedure/surgical mask. A N95 respirator should only be substituted for the procedure mask during aerosol-generating medical procedures (AGMP).²⁻³

¹ <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations>

² Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings. <https://www.cdc.gov/coronavirus/2019-ncov/infection-control/control-recommendations.html>

³ Infection prevention and control for COVID-19 in healthcare settings <https://www.ecdc.europa.eu/en/publications-data/infection-prevention-and-control-covid-19-healthcare-settings>



A letter to the editor recently published in the *New England Journal of Medicine*⁴ indicated that the COVID-19 virus can remain active in aerosols for at least three hours (at which time the experiment ended), which has raised concerns for some. It is important to note, however, that this occurred under highly controlled laboratory conditions that are not reflective of a real-world healthcare setting (“Aerosols ... were generated with the use of a three-jet Collision nebulizer and fed into a Goldberg drum to create an aerosolized environment,” van Dormelan et al., 2020, para. 2).

The Saskatchewan Health Authority has established PPE guidelines to prioritize the allocation of respirators, such as N95s, to those who are at the greatest risk of being exposed to *aerosols* that may contain the virus—that is, those involved in AGMPs. Studies investigating whether the COVID-19 virus is present in the air at bedside have not shown any evidence to suggest that the virus remains present in the air under normal clinical conditions.⁵⁻⁶

In order to do our best to protect the health and safety of everyone in the province of Saskatchewan, it is essential that the limited N95 respirators and similar PPE be used in a manner in keeping with the global evidence about potential routes of transmission. We need to ensure that the subset of healthcare workers at risk of exposure to aerosols via AGMPs will have access to appropriate devices in order to protect their health and safety, as well as that of those individuals with whom they will later come into contact. Ensuring that PPEs are available to the right people, at the right time, as well as practicing good hand hygiene and physical distancing, are the best tools we have in our toolkit to contain the spread of COVID-19 and protect the health and well-being of the people of Saskatchewan.

⁴ van Doremalen, N. et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *N Engl J Med* online March 17, 2020. DOI: 10.1056/NEJMc2004973

⁵ Cheng V, Wong S-C, Chen J, Yip C, Chuang V, Tsang O, et al. Escalating infection control response to the rapidly evolving epidemiology of the Coronavirus disease 2019 (COVID-19) due to SARS-CoV-2 in Hong Kong. *Infect Control Hosp Epidemiol*. 2020 Mar 5 [Epub ahead of print].

⁶ Ong SW, Tan YK, Chia PY, Lee TH, Ng OT, Wong MS, et al. Air, surface environmental, and personal protective equipment contamination by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from a symptomatic patient. *JAMA*. 2020