



Risk to healthcare workers from aerosol generating procedures during omicron.

Disclaimer:

This *Quick Response Report* was completed on January 21, 2022. Given the rapidly changing nature of the coronavirus pandemic, some of the references included in this report may quickly become out-of-date. We further caution readers that researchers at the Newfoundland & Labrador Centre for Applied Health Research are not experts on infectious diseases and are relaying work produced by others. This report has been produced quickly and it is not exhaustive, nor have the included studies been critically appraised.

Original Inquiry

“Is there an increased risk to healthcare workers from Aerosol- Generating Medical Procedures (AGMPs) with the omicron variant of SARS-CoV-2?”

Summary

- Based on research evidence, the omicron variant of SARS-CoV-2 is more transmissible than any previous variant or wild type¹ because the variant exists in a higher proportion of very high emitting infected individuals and requires a lower critical dose for infection to occur. It is also transmissible to individuals with expected immunity from vaccines or from previous exposure to the virus.
- There is agreement in available guidance for healthcare workers that workers who are exposed to infected patients in general, and involved with aerosol generating procedures in particular, should employ personal protective equipment/respiratory protective equipment, including respirators with N95, equivalent, or higher filtration standards.
- In addition to N95 or better filtration standards, it is critical that respiratory protective equipment be properly fitted to the face in order to be effective.

Guidance

World Health Organization. **WHO recommendations on mask use by health workers, in light of the Omicron variant of concern.** December 22, 2021. [LINK](#)

- “In light of the rapid spread of the Omicron variant of concern(1) (VOC) of SARS-CoV-2, the virus that causes coronavirus disease (COVID-19), the World Health Organization

¹ Wild Type is a strain, gene, or characteristic which prevails among individuals in natural conditions, as distinct from an atypical mutant type.

(WHO) recommends the following regarding the use of masks by health workers providing care to patients with suspected or confirmed COVID-19:

- A respirator (FFP2, FFP3, NIOSH-approved N95, or equivalent or higher-level certified respirator) or a medical mask should be worn by health workers along with other personal protective equipment (PPE) – a gown, gloves and eye protection – before entering a room where there is a patient with suspected or confirmed COVID-19.
- A respirator should always be worn along with other PPE (see above) by health workers performing aerosol-generating procedures (AGPs) (2) and by health workers on duty in settings where AGPs are regularly performed on patients with suspected or confirmed COVID-19, such as intensive care units, semi-intensive care units or emergency departments.
- Appropriate mask fitting should always be ensured (for respirators through initial fit testing and seal check and for medical masks through methods to reduce air leakage around the mask) as should compliance with appropriate use of PPE and other precautions.
- Related news reporting: Fortune India: [Respirator, gloves, eyewear & PPE must for health workers: WHO on Omicron](#). December 24, 2021.
 - “The guideline insists that the health worker should wear a respirator (FFP2, FFP3, NIOSH-approved N95, or equivalent or higher-level certified respirator) or a medical mask along with other personal protective equipment (PPE) – a gown, gloves and eye protection – before entering a room where there is a patient with suspected or confirmed Covid-19... The guideline emphasises the use of respirator along with other PPE by health workers performing aerosol-generating procedures (AGPs) and by health workers on duty in settings where AGPs are regularly performed on patients with suspected or confirmed Covid-19, such as intensive care units, semi-intensive care units or emergency departments.”

UK Health Security Agency. **Infection prevention and control for seasonal respiratory infections in health and care settings (including SARS-CoV-2) for winter 2021 to 2022.**

Updated 17 January 2022. [LINK](#)

- See Section 2.1 Main Changes and Updates
 - “In response to Omicron and other variants of concern (VOCs) it is recommended that staff and organisations continue to undertake risk assessments using the hierarchy of controls which include an evaluation of the ventilation in the area, operational capacity, physical distancing and prevalence of COVID-19. Where a risk assessment indicates it, [respiratory protective equipment] should be available to all relevant staff. Staff should be provided with training on correct use. The text has been updated to make this clearer.”
- Respiratory protective equipment (RPE)
 - “Respiratory protection that is worn over the nose and mouth designed to protect the wearer from inhaling hazardous substances, including airborne particles (aerosols). There are 2 types of respiratory protection that can be used, tight-

fitting disposable FFP respirators and loose-fitting powered respirator hoods (TH2). FFP stands for filtering face piece. There are 3 categories of FFP respirator: FFP1, FFP2 and FFP3. FFP3 and loose-fitting powered respirator hoods provide the highest level of protection and are recommended when caring for patients in areas where high risk AGPs are being performed.

- See Section 6.6 Aerosol Generating Procedures
 - “Only staff who are needed to undertake the procedure should be present, wearing airborne PPE/RPE precautions.”

Public Health Agency of Canada. **Update with consideration of Omicron – Interim COVID-19 infection prevention and control in the health care setting when COVID-19 is suspected or confirmed.** December 23, 2021. [LINK](#)

- “Recommendations for health care settings include the following:
 - Aerosol exposure – Historically, certain procedures were thought to pose a higher risk for health care workers on the basis of case–control studies, mainly from SARS-CoV-1, that reported associations between selected procedures and health care worker infections. These have been called Aerosol Generating Medical Procedures (AGMPs). As scientific inquiry quantifies the aerosols produced by such procedures, it appears that they do not cause any more aerosols than coughing, singing or talking loudly. Aerosol production can also vary by individual. As these concepts are studied, a better understanding may lead to a change in infection control guidance. Until then it is prudent to continue to use fit tested N95 respirators, eye protection, gowns and gloves for all AGMPs.
 - Health care workers can choose to wear a respirator at any time taking into account such factors as the community incidence of SARS-CoV-2, patient’s ability to tolerate a mask, patient behaviours such as shouting or heavy breathing, requirement of extensive or prolonged close proximity, and other factors”

Public Health Ontario. **Interim IPAC Recommendations for Use of Personal Protective Equipment for Care of Individuals with Suspect or Confirmed COVID-19.** December 15, 2021. [LINK](#)

- Key Findings:
 - There are early estimates of significant increased transmissibility and decreased vaccine effectiveness with the Omicron (B.1.1.529) variant. It is unclear at this time if there is a change in the infectiousness of aerosols as a possible explanation for this increase in transmissibility. In light of this, all layers of protection in healthcare settings should be optimized to prevent transmission until more information is available
 - Given the undetermined impact of the Omicron (B.1.1.529) variant, the interim recommended PPE when providing direct care for patients with suspect or confirmed COVID-19 includes a fit-tested, seal-checked N95 respirator (or equivalent or greater protection), eye protection, gown, and gloves. Other appropriate PPE includes a well-

- fitted surgical/procedure (medical) mask, or non-fit tested respirator, eye protection, gown and gloves for direct care of patients with suspect or confirmed COVID-19.
- Fit tested N95 respirators (or equivalent or greater protection) should be used when aerosol generating medical procedures (AGMPs) are performed or anticipated to be performed on patients with suspect or confirmed COVID-19

Alberta Health Services. **Personal Protective Equipment (PPE) Frequently Asked Questions.**
Updated January 20, 2022. [LINK](#)

- “The updated joint agreement of December 2021 sets out new minimum PPE requirements including that all clinical and non-clinical health care workers who enter a room or space, or are within two metres of a patient with suspected, presumed or confirmed COVID-19, will wear a fit-tested N95 respirator, gown, gloves, and eye protection. In addition, all clinical and non-clinical health care workers are now expected to wear N95 respirators in settings where frequent or unexpected exposure to aerosol generated medical procedures is anticipated.”
- “If performing an aerosol-generating medical procedures, a fit-tested and seal-checked N95 respirator should be worn in place of a surgical or procedure mask in addition to gloves, gown, and eye protection.”

Nova Scotia Health. **COVID-19 Protocol for Additional Precautions for SARS-CoV-2 in Health Care Settings.** Updated January 3, 2022. [LINK](#)

- “All health care workers must:
 - perform a point of care risk assessment before every patient/resident/client interaction to determine the most suitable respiratory protection;
 - at a minimum, if providing care to patients, residents, or clients with suspected, probable, or confirmed COVID-19 infection, wear a well-fitting medical mask OR respirator (N95), gloves, face shields with side protection (or goggles), and appropriate isolation gowns. As an interim measure, health care workers who are not yet fit-tested for an N95 respirator (or equivalent) may wear a respirator, and employers in health care settings will make reasonable efforts to ensure their employees obtain fit-testing at the earliest opportunity;
 - use fit-tested, seal-checked N95 respirators (or approved equivalent) in the room where Aerosol Generating Medical Procedures (AGMPs) are being performed, are frequent or probable; and
 - if providing direct care to or interacting with suspected, probable, or confirmed COVID-19 patients, residents, or clients, have access to appropriate PPE and will not be denied access to respirators (N95), or an approved equivalent.”

Health Prince Edward Island. **COVID-19 Omicron PPE GUIDANCE, V2.** January 07, 2022. [LINK](#)

- “Given the undetermined impact of the Omicron variant, the interim recommended PPE when providing any direct care for patients with suspect or confirmed COVID-19* includes:

- When providing direct care to other patients (no suspicion or confirmation of COVID-19), recommended PPE is a medical grade mask and eye protection.
 - Double masking is acceptable if people prefer.
 - N95s are not recommended for these situations as they are more difficult to comply with and only offer minimal added protection compared to medical mask or double masks.
- When providing direct care to patients with Suspect or Confirmed COVID-19:
 - A fit-tested, seal-checked N95 respirator (or equivalent), eye protection, gown, and gloves. OR
 - Two well-fitted surgical/medical masks, eye protection, gown and gloves. OR
 - A non-fit tested respirator, eye protection, gown and gloves (perform a mask fit check)
- When performing Aerosol Generating Medical Procedures (AGMPs): Fit tested N95 respirators (or equivalent) should be used when aerosol generating medical procedures (AGMPs) are performed or anticipated to be performed on patients with suspect or confirmed COVID-19.

Shared Health Manitoba. **Important PPE Reminders.** Updated December 29, 2021. [LINK](#)

“Page 5: Handling, Cleaning, and Disinfection of Patient Care Equipment:

- With the rapid spread of Omicron, fit-tested N95s should be the default choice of respiratory protection for patient care in red and orange zones. If, following completion of a point of care risk assessment (PCRA), staff feel a procedure mask is appropriate, they can choose to wear one.
- This guidance DOES NOT CHANGE OR SUPERCEDE existing guidance related to “Same Day/Next Day Testing” and Aerosol Generating Medical Procedures (AGMP). These requirements [\(link\)](#) have not changed. Fit-tested N95s are required for AGMPs regardless of Zone, with the exception of those following “Same Day Next Day”.

Systematic Reviews

None available.

Other Reviews

None available.

Expert Opinion

BMJ. **Covid-19: Give NHS staff working with patients higher grade masks, say medical leaders.** December 30, 2021. [LINK](#)

- “Three national organisations said that filtering facepiece respirators (FFP3s) should be made fully available because of the increased transmissibility of the omicron variant. The BMA, the Hospital Consultants and Specialists Association, and the Doctors’ Association UK, concerned at rising hospital admissions and rates of staff sickness, cite growing evidence that airborne transmission of SARS-CoV-2 is a major driver of infection.”
- “The NHS is required to follow UK national guidance on infection and prevention control, which was updated by the UK Health Security Agency on 21 December. This says that an FFP3 respirator (or equivalent) must be used by staff when they care for patients with a suspected or confirmed infection that is spread wholly by the airborne route, and when performing aerosol generating procedures on a patient with a suspected or confirmed infection spread wholly or partly by the droplet or airborne route”

Doctors’ Association UK. **Open letter to Jenny Harries and Ian Peters requesting urgent amendment to the outdated PPE guidance issued by the UKHSA.** December 20, 2021. [LINK](#)

- “It is increasingly clear that airborne spread is significant in the transmission of Covid, and particularly so with the Omicron variant. The current guidance makes an artificial distinction between normal patient care and “aerosol generating procedures”. We now know that breathing is sufficient to generate airborne coronavirus capable of infecting others who are breathing the same air. We call for an urgent review of the guidance to recommend full airborne protection for all staff in clinical areas.
- With UK Omicron rates doubling roughly every two days we must treat every patient we see as being a potential carrier of Covid.
- In order for NHS employers to discharge their legal duties under the Health and Safety at Work etc Act, we believe it is necessary to provide FFP3 masks for all staff working indoors where exhaled air from patients is circulating.”

Primary Research

Swiss Medical Weekly. **Higher viral load and infectivity increase risk of aerosol transmission for Delta and Omicron variants of SARS-CoV-2.** January 6, 2022. [LINK](#)

- “Our modelling suggests that a much larger proportion of individuals infected with the new variants are high, very high or super-emitters of airborne viruses: for the WT, one in 1,000 infected was a super-emitter; for Delta one in 30; and for Omicron one in 20 or one in 10, depending on the viral load estimate used. Testing of the effectiveness of protective strategies in view of the lower critical dose suggests that surgical masks are no longer sufficient in most public settings, while correctly fitted FFP2 respirators still provide sufficient protection, except in high aerosol producing situations such as singing or shouting”
- “From an aerosol transmission perspective, the shift towards a larger proportion of very high emitting individuals, together with the strongly reduced critical dose, seem to be two important drivers of the aerosol risk, and are likely contributing to the observed rapid spread of the Delta and Omicron variants of concern. Reducing contacts, always wearing well-fitted FFP2 respirators when indoors, using ventilation and other methods

to reduce airborne virus concentrations, and avoiding situations with loud voices seem critical to limiting these latest waves of the COVID-19 pandemic.”

- Related news reporting: News Medical: [“Study reveals factors responsible for increased risk of aerosol transmission for SARS-CoV-2 Delta and Omicron”](#), January 14, 2022.

Methodology

Newfoundland and Labrador Centre for Applied Health Research (NLCAHR) COVID-19 Quick Response reports are initiated by, and shared with, our partners in the provincial health system, including the four Regional Health Authorities, the Departments of Health and Community Services and Children, Seniors and Social Development, and public health officials.

NLCAHR staff work with topic submitters to clarify the research question. We then search for related systematic reviews, meta-analyses, other reviews, interim and other guidance statements, primary research, expert opinion and health and science reporting.

We use several search strategies, with a focus on the following databases:

- [Alberta Health Services](#)
- [CADTH](#)
- [Canadian Pharmacists Association](#)
- [Campbell Collaboration](#)
- [Cochrane Collaboration](#)
- [Centre for Disease Control](#) (CDC)
- [Centre for Evidence Based Medicine](#) (CEBM)
- [Evidence for Policy and Practice Information and Co-ordinating Centre](#)
- [European Centre for Disease Prevention and Control](#)
- [Health Canada](#)
- [Joanna Briggs Institute](#)
- [Johns Hopkins](#)
- [MedRxiv](#)
- [National Institutes of Health](#) (NIH)
- [National Institute of Allergy and Infectious Diseases](#) (NIAID)
- [National Library of Medicine](#)
- [Public Health Agency of Canada](#)
- [Trip Database](#)
- [World Health Organization](#)

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