

EVIDENCE BRIEF

Infection Prevention and Control for First Responders Providing Direct Care for Suspected or Confirmed COVID-19 Patients

March 29, 2020

Key Messages

- COVID-19 is primarily transmitted via droplets and fomites during close contact. Droplet and Contact Precautions including eye protection, surgical/procedure masks (hereafter referred to as masks), gloves, gowns, and meticulous and frequent hand hygiene are recommended for first responders to prevent COVID-19 transmission.
- Airborne spread has not been reported for COVID-19. Airborne Precautions, including N95 respirators, are recommended in addition to Droplet and Contact Precautions for aerosol-generating medical procedures (AGMP) which include: tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation during airway management, manual ventilation, bronchoscopy, non-invasive positive pressure ventilation for acute respiratory failure (CPAP, BiPAP3-5), and high flow oxygen therapy.
- The use of Droplet and Contact Precautions, with Airborne Precautions only used for AGMPs, is consistent with current evidence on COVID-19, as well as guidance from the Public Health Agency of Canada (PHAC) and World Health Organization (WHO).
- Advice for healthcare workers' to use Routine Practices and point of care risk assessments to determine appropriate personal protective equipment (PPE) for care of confirmed or suspected COVID-19 patients is applicable to first responders and individuals providing first aid.
- First responders should select PPE based on a patient interaction risk assessment. Droplet and Contact Precautions are recommended for the routine care of confirmed or suspected COVID-19 patients. An N95 respirator should be used to perform AGMP.

Important context

“First responders in Ontario are defined as those men and women who, in the early stages of an emergency, are responsible for the protection and preservation of life, property, evidence and the environment. They include police officers, firefighters, military personnel, paramedics, medical evacuation pilots, dispatchers, nurses, doctors, emergency medical technicians and emergency managers.”¹ This may also include individuals who act in a volunteer position. This advice applies equally to individuals trained in first aid as part of their job.

Background

In the early stages of the Coronavirus Disease 2019 (COVID-19) response in Ontario, personal protective equipment (PPE) recommendations for assessment^a and specimen collection for COVID-19 included Routine Practices and Airborne Precautions, in addition to Droplet and Contact Precautions. Airborne Precautions were recommended initially based on the precautionary principle because of uncertainty about the transmission mode for this novel pathogen.²

Since early January 2020, there is an expanded understanding of the transmission of COVID-19. Additionally, the Public Health Agency of Canada (PHAC) and World Health Organization (WHO) have released recommendations supporting the use of Droplet and Contact Precautions for clinical interactions, and advising that Airborne Precautions are only required for aerosol-generating medical procedures (AGMPs).

Current literature was reviewed, including select jurisdictional guidance documents, of evidence related to the transmission of COVID-19 to inform recommendations for first responders' PPE. Literature was predominantly drawn from health care worker-based studies which have been extrapolated to first responder scenarios.

Main Findings

Mode of transmission of COVID-19

- Current evidence suggests that the mode of transmission of COVID-19 is through direct contact and respiratory droplets that have the potential to be propelled for up to two meters.³⁻⁵
- To date, there have been no published reports of airborne transmission.
- The majority of cases have been linked to person-to-person transmission through close direct contact to someone with respiratory symptoms^{4,6} or transmission through an index case who was subsequently tested positive for COVID-19 and/or has developed mild symptoms.⁷
- The lack of transmission identified through non-close contacts, such as on airplanes, supports droplet, opposed to airborne, transmission.^{8,9}
- Further information on routes of transmission has been summarized in PHO's "[What We Know So Far about... Routes of Transmission.](#)"

First responder transmissions

- Recently, there have been reports of COVID-19 infections among first responders in North America. In some cases, it is unknown whether these first responders contracted the virus

^a "Assessment" refers to physical examinations, or other close clinical interactions, within 2 metres.

through community contacts or through contact with infected individuals while performing their duties.¹⁰⁻¹³

- There have been reports describing health care workers infected with COVID-19.¹⁴⁻¹⁶ For the most part, these occurred early in the outbreak when there was limited information on the virus; information on access, use or adherence to PPE is not available; and it is unclear whether the infection was community- or hospital-acquired.
- A case report of 41 healthcare workers, 85% of whom wore masks and 15% N95 respirators, were exposed during high risk procedures to an intubated COVID-19 patient. None were infected suggesting droplet and contact precautions provide adequate protection.¹⁷
- Further information on health care worker transmission has been summarized in PHO's "[What We Know So Far about... the Risks to Health Care Workers.](#)"

Guidance from other public health organizations

- Not all organizations had specific guidance for first responders at the time of this review.
- WHO: There are some considerations for PPE provided for scenarios that ambulance drivers and transfer workers may experience. Advice for direct care is in line with WHO recommendations for healthcare workers to use Droplet and Contact Precautions with masks, eye protection, long-sleeved cuffed gowns, gloves and the use of meticulous and frequent hand hygiene.¹⁸ The addition of Airborne Precautions, including N95 respirators are recommended for AGMPs. AGMPs are tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation, bronchoscopy, non-invasive positive pressure ventilation for acute respiratory failure (CPAP, BiPAP3-5), and high flow oxygen therapy.^{19,20}
- PHAC: There are no current advice specific to first responders. However, for healthcare workers, PHAC recommends Droplet and Contact Precautions in addition to Routine Practices, and Airborne Precautions for AGMPs.²¹
- The United States Centers for Disease Control and Prevention (CDC): The CDC recommends using masks as an appropriate replacement for use of N95 respirators except when AGMPs are involved.²² The minimum PPE recommended is: A single pair of disposable examination gloves, disposable isolation gown or single-use/disposable coveralls, any NIOSH-approved particulate respirator (i.e., N-95 or higher-level respirator); facemasks are an acceptable alternative until the supply chain is restored, and eye protection (i.e., goggles or disposable face shield that fully covers the front and sides of the face).²³ For law enforcement if unable to wear a disposable gown or coveralls because it limits access to duty belt and gear, ensure duty belt and gear are disinfected after contact with individual.²⁴

Other considerations

- There is evidence demonstrating that N95 respirators are difficult to wear in clinical settings and the adjustment of the respirator leads to touching the face with contaminated hands/gloves, thus exacerbating the potential for transmission.²⁵

- There is community misconception around the importance of N95 respirators and a lack of appreciation of the importance of eye protection and meticulous and frequent hand hygiene.²⁶
- There is evidence that N95 respirators do not provide added protection for health care workers exposed to COVID-19 or other viruses that are spread by droplet and contact.^{27,28}
- Lack of eye protection and incorrect PPE doffing (removal) were significant risk factors for SARS transmission to health care workers, and these should be emphasized as important components of droplet/contact PPE.²⁹

Conclusions

Based on the current best available evidence, COVID-19 is spread via droplets and fomites, and not through airborne spread. In addition, evidence from other viruses such as SARS and influenza do not support a benefit to wearing a N95 respirators for routine clinical care.^{27, 29} Ontario is aligned with PHAC and WHO’s recommendations for Droplet and Contact Precautions for care of known or suspected cases of COVID-19. This includes: eye protection, masks, gloves, gowns, and meticulous hand hygiene. Airborne Precautions including N95 respirators should be used for AGMPs including: tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation, and bronchoscopy (note that AGMPs do not include nasopharyngeal or throat swab specimen collection).^{19,}
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Implications for Practice

First responders should select PPE based on a patient interaction risk assessment. Droplet and Contact Precautions are recommended for the routine care of confirmed or suspected COVID-19 patients. An N95 respirator should be used to perform aerosol-generating medical procedures.

Summary of PPE Recommendations for First Responders

Individual	Activity	Type of PPE or procedure
Medical response personnel (e.g. Paramedics, nurses, doctors, emergency medical technicians)	Intubation High Flow Oxygen	Droplet and Contact Precautions: <ul style="list-style-type: none"> - N95 respirators fit tested, seal checked - Isolation gown - Gloves - Eye protection (goggles or face shield)
First responders	Mask and oxygen therapy	Routine Practices – Droplet and Contact Precautions <ul style="list-style-type: none"> - Surgical /Procedure mask - Isolation gown - Gloves - Eye protection (goggles or face shield)

First Responders	Chest compressions	Routine practices – Droplet and Contact Precautions - Surgical /Procedure mask - Isolation gown - Gloves - Eye protection (goggles or face shield)
First Responders	Hemorrhage Application of Pressure for a bleed	Routine practices – Droplet and Contact Precautions - Surgical /Procedure mask - Isolation gown - Gloves - Eye protection (goggles or face shield)

Additional Resources

- PIDAC (2020). [Best Practices for Prevention, Surveillance and Infection Control Management of Novel Respiratory Infections in All Health Care Settings](#)

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Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Evidence Brief: Infection Prevention and Control Recommendations for Health care Workers Caring for Suspected or Confirmed COVID-19 Patients Toronto, ON: Queen's Printer for Ontario; 2020.

ISBN

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