

COVID-19 Standards and Practices for First Responders: Auscultation of COVID-19+ Patients

Disclaimer:

This *Quick Response Report* was published on June 30, 2021. 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rapidly changing nature of the coronavirus pandemic, some of the references included in this report may quickly become out-of-date.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

“Does auscultation of COVID-19 positive patients by staff using standard stethoscopes pose a risk to these staff when they place the stethoscope in the ears while wearing PPE?”

Summary

- There is insufficient evidence to determine whether auscultation of COVID-19+ patients with standard stethoscopes poses a risk to staff when placing the stethoscope in the ears while wearing PPE.
- However, PPE covers the ears and creating openings has the potential to compromise the sterile barrier, therefore this is not recommended. Ear pouches have been made using surgical masks; the safety of this is yet to be determined.
- Auscultation using standard stethoscopes should be limited to situations where it is clinically useful.
- If possible, disposable stethoscopes or stethoscopes dedicated to individual patients should be used during a patient’s stay and should be thoroughly cleaned and disinfected before use on another patient.
- Alternate technologies such as wireless stethoscopes and lung ultrasounds could potentially reduce healthcare worker risk of exposure to COVID-19 and reduce patient movement from the consultation room to other areas of the hospital such as the radiology room.

Guidance

World Health Organization. **Clinical management of COVID-19 patients: living guidance, 25 January 2021.** March 15, 2021. [LINK](#)

- “Section 7. Immediate implementation of appropriate infection prevention and control measures:
 - Apply standard precautions according to risk assessment for all patients, at all times, when providing any diagnostic and care services. Standard precautions include but are not limited to, hand and respiratory hygiene and the appropriate use of PPE; universal masking is required for all persons in areas of known or suspected community or cluster SARS-CoV-2 transmission. Standard precautions also include appropriate patient placement; environmental cleaning; prevention of needle-stick or sharps injury and safe waste management.
 - Carefully practise hand hygiene using an alcohol-based hand rub if hands are not visibly dirty or soap and water and disposable towels, before PPE use and after PPE removal, and when indicated while providing care, according to the WHO Five Moments for hand hygiene.
 - If possible, use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs, pulse oximeters and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use. Ensure that health care workers avoid contaminating environmental surfaces that are not directly related to patient care (e.g., door handles and light switches) and refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands. All surfaces should be routinely cleaned and disinfected, especially high touch surfaces, those surfaces touched by patients and whenever visibly soiled or if contaminated with blood and body fluids.
 - Best practices for safely managing health care waste, including waste related to surgeries and obstetric care, should be followed.”

Centers for Disease Control and Prevention. **COVID-19 Overview and Infection Prevention and Control Priorities in non-US Healthcare Settings.** (February 26, 2021). [LINK](#)

- “The information in this document draws from the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) guidance documents and Infection Prevention and Control (IPC) priorities for the response to COVID-19 in healthcare settings and includes information that can be used in non-US contexts.”
- “Current WHO guidance for healthcare workers caring for suspected or confirmed COVID-19 patients recommends the use of contact and droplet precautions in addition to standard precautions (unless an aerosol generated procedure is being performed, in which case airborne precautions are needed). Disposable or dedicated patient care equipment (e.g., stethoscopes, blood pressure cuffs) should be used; however, if

equipment needs to be shared among patients, then it should be cleaned and disinfected between use for each patient (ethyl alcohol of at least 70%).”

Public Health Canada. Infection prevention and control for COVID-19: Interim guidance for acute healthcare settings (January 8, 2021). [LINK](#)

- The purpose of this document is to provide updated interim IPC guidance to healthcare organizations and HCWs to prevent the transmission of COVID-19 in acute healthcare settings.
- “Hospital-grade disinfectant (e.g., disinfectant wipes) should be used with the recommended contact time to disinfect smaller patient care equipment (e.g., blood pressure cuffs, thermometers, pulse oximeters, stethoscopes) after each use.”

Alberta Health Services. Stethoscope Use for Patients on Contact and Droplet Precautions including COVID-19 Patients: Best practice recommendations (October 30, 2020). [LINK](#)

- “In addition to routine practices, e.g., hand hygiene, follow contact and droplet precautions:
 - Dedicate reusable stethoscopes for a single patient use until discharge, if possible.
 - Clean and disinfect the stethoscope with a ready-to-use disinfectant wipe following instructions on page 2 before and after each use.”
- “If a dedicated stethoscope is not available, a personal stethoscope may be taken into the patient’s room. Follow these steps:
 - Check that ready-to-use disinfectant wipes are available for cleaning before room entry and upon exit from the room.
 - Clean and disinfect the stethoscope following instructions on page 2.
 - Perform hand hygiene, and don personal protective equipment (PPE) required for contact and droplet precautions, i.e., gown, mask, face shield/eye protection, and gloves.
 - Enter room holding stethoscope. Do not put stethoscope around neck as there is potential to contaminate PPE and the head and neck region.”

BC Centre for Disease Control. COVID-19 Infection Prevention and Control: Guidance for Acute Health-Care Settings (May 12, 2021). [LINK](#)

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

- Identify which staff are responsible for cleaning patient care equipment and inform them about all required duties.
- Dedicate reusable, non-critical equipment and supplies specifically to individual patients with suspected or confirmed COVID-19 infections, when possible.
- If dedicating equipment and supplies to an individual patient is not possible, clean and disinfect noncritical equipment that is shared between multiple patients (e.g., blood pressure cuffs, electronic thermometers, oximeters, stethoscope) with hospital-grade

disinfectant (e.g., disinfectant wipes) between uses, in accordance with institutional IPC and environmental services protocols.

- Always follow the manufacturer's instructions for dilution, contact times, safe use, and the compatibility of materials for all cleaning and disinfection products.
- Disposable items that cannot be easily cleaned and disinfected should be dedicated to just one patient and discarded upon patient transfer or discharge.
- Discard all single-use items into appropriate bins after use. Some PPE supplies are being collected and reprocessed as a contingency during the COVID-19 pandemic. Follow institutional guidance for the collection of these items.
- Remove personal care items left behind by the patient after their discharge."

Anaesthesia. **Consensus guidelines for managing the airway in patients with COVID-19** (March 27, 2020). [LINK](#)

- "Recommendations on the prevention of contamination of healthcare workers, the choice of staff involved in airway management, the training required and the selection of equipment are discussed. The fundamental principles of airway management in these settings are described for: emergency tracheal intubation; predicted or unexpected difficult tracheal intubation; cardiac arrest; anaesthetic care; and tracheal extubation. We provide figures to support clinicians in safe airway management of patients with COVID-19. The advice in this document is designed to be adapted in line with local workplace policies."
- "Anaesthetic and airway technique for emergency tracheal intubation...Confirming correct depth of insertion may be difficult. (a) ***Auscultation of the chest is difficult when wearing airborne precaution PPE and is likely to risk contamination of the stethoscope and staff, so is not recommended.***" (emphasis added)

Systematic Reviews

Therapeutic Advances in Infectious Disease. **Methods to disinfect and decontaminate SARS-CoV-2: a systematic review of in vitro studies** (March 16, 2021). [LINK](#)

- "Methods: We conducted a systematic review of the literature on cleaning, disinfection or decontamination methods in the prevention of SARS-CoV-2.
- Results: A total of 27 studies were included, reporting a variety of methods with which the effectiveness of interventions were assessed. Virus was inoculated onto different types of material including masks, nasopharyngeal swabs, serum, laboratory plates and simulated saliva, tears or nasal fluid and then interventions were applied in an attempt to eliminate the virus including chemical, ultraviolet (UV) light irradiation, and heat and humidity. At body temperature (37°C) there is evidence that the virus will not be detectable after 2 days, but this can be reduced to non-detection at 30min at 56°C, 15min at 65°C and 2min at 98°C. Different experimental methods testing UV light have

shown that it can inactivate the virus. Light of 254–365 nm has been used, including simulated sunlight. Many chemical agents including bleach, hand sanitizer, hand wash, soap, ethanol, isopropanol, guanidium thiocyanate/t-octylphenoxypolyethoxyethanol, formaldehyde, povidone-iodine, 0.05% chlorhexidine, 0.1% benzalkonium chloride, acidic electrolysed water, Clyraguard copper iodine complex and hydrogen peroxide vapour have been shown to disinfect SARS-CoV-2.”

Other Reviews

The American Journal of Medicine. **Persistent Value of the Stethoscope in the Age of COVID-19** (June 18, 2020). [LINK](#)

- “The stethoscope has long been at the center of patient care, as well as a symbol of the physician–patient relationship. While advancements in other diagnostic modalities have allowed for more efficient and accurate diagnosis, the stethoscope has evolved in parallel to address the needs of the modern era of medicine. These advancements include sound visualization, ambient noise reduction/cancellation, Bluetooth (Bluetooth SIG Inc, Kirkland, Wash) transmission, and computer algorithm diagnostic support. However, despite these advancements, the ever-changing climate of infection prevention, especially in the wake of the COVID-19 pandemic, has led many to question the stethoscope as a vector for infectious diseases. Stethoscopes have been reported to harbor bacteria with contamination levels comparable with a physician's hand. Although disinfection is recommended, stethoscope hygiene compliance remains low. In addition, disinfectants may not be completely effective in eliminating microorganisms. Despite these risks, the growing technological integration with the stethoscope continues to make it a highly valuable tool. Rather than casting our valuable tool and symbol of medicine aside, we must create and implement an effective method of stethoscope hygiene to keep patients safe.”

CMAJ. **Principles for clinical care of patients with COVID-19 on medical units** (June 3, 2020). [LINK](#)

- “Health systems have responded to the coronavirus disease 2019 (COVID-19) pandemic by prioritizing critical care capacity; however, most patients with COVID-19 are cared for outside intensive care units (ICUs). In many jurisdictions, the first wave of cases is waning, but as public health measures such as physical distancing are relaxed, subsequent waves seem inevitable. Protocols are needed to guide care for patients with COVID-19 who are not critically ill, ideally on separate inpatient units designed to optimize patient care while limiting the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) from those with the virus to others. We considered available evidence and drew on our local experiences in Madrid and Toronto to propose an approach to the development of COVID-19 units and care teams. We discuss the layout of COVID-19 units, structure of the physician care team, clinical assessment and rounding protocols, evidence-based

methods to foster culture change and ways to mitigate the adverse effects of isolation for patients.”

- “The marginal added value of auscultation above careful clinical observation must be balanced with the increased risk of nosocomial infection conferred by the stethoscope. Viable SARS-CoV-2 has been detected for up to 72 hours on plastic and stainless-steel surfaces. Therefore, the routine use of stethoscopes for patients with COVID-19 should be limited, and, in clinical situations where auscultation is deemed useful (e.g., assessment for wheezing in patients with suspected bronchoconstriction), extra attention to infection control should be exercised.”

Expert Opinion

European Heart Journal. **Don’t throw the stethoscope away!** (January 2021). [LINK](#)

- “We would like to share a method for preparing a simple substitute to the traditional stethoscope. This simple stethoscope can be prepared with a sterilized paper tube around an empty potato chips cylindrical packet. It can be placed on each bed to prevent cross-contamination. It is economical, safe, and free (Figures 1–3), and none of our medical workers had been infected with SARS-CoV-2”

BMJ. **Are stethoscopes risky in COVID-19?** (May 21, 2020). [LINK](#)

- “The Littmann classic III stethoscope has a detachable rubber ear tip piece that fits the external ear. To avoid transmitting infection, the bell and diaphragm can be cleaned with alcohol, and the plastic ear tip piece can be detached for thorough cleaning although it is not alcohol resistant. Only one size ear tip piece is available for all stethoscope types despite a smaller diameter metal stem for the classic III. Vigorous alcohol scrubbing and turning can loosen and detach the ear tip pieces. We report an unusual risk of the stethoscope.”

The Lancet: Respiratory Medicine. **COVID-19 outbreak: less stethoscope, more ultrasound** (May 01, 2020). [LINK](#)

- “During a COVID-19 outbreak, it is important to minimise the health care–patient interactions to only the necessary procedures. There are several studies showing the accuracy of lung ultrasound in detecting lung pathologies, from bacterial and viral pneumonia to acute respiratory distress syndrome and its non-inferiority to chest x-ray and clinical examination. Therefore, we believe that such a procedure could reduce health-care workers' risk of exposure and also patient movement from the consultation room to the radiology room. Considering the contagiousness of the virus and the need to reduce nosocomial outbreaks, we strongly suggest promotion of lung ultrasound in this setting.”

European Journal of Obstetrics & Gynecology and Reproductive Biology. **Auscultating with personal protective equipment (PPE) during COVID-19 pandemic – Challenges and solutions** (November 11, 2020). [LINK](#)

- “One of the main limitations is the difficulty to healthcare workers carrying out auscultation using stethoscope. Since both ears are covered completely with hood of PPE suit, earpieces of stethoscope cannot be directly placed into ears. The earpiece can only be placed over PPE gown, and it is difficult to auscultate this way. Creating opening in PPE is not advisable as it might breach the sterile barrier and increase the risk of transmission. Moreover, a stethoscope can also serve as a potential fomite which can facilitate cross contamination between patients [...] This issue can be addressed by using innovative equipment instead of traditional stethoscopes. Creating ear pouches on either side of PPE hood using the fabric of surgical masks to allow access to earpieces of stethoscopes have been tried in resource limited setup but its safety has not been established.”

Primary Research

BMC: Antimicrobial Resistance & Infection Control. **Keeping PPE barriers in COVID-19 wards while doing proper auscultation (09 December 2020).** [LINK](#)

- “The emerging COVID-19 pandemic poses many difficulties to medical professionals. One of them is the need to use personal protective equipment (PPE) in order to protect themselves and their families, while not compromising their care. Physical examination is one of the cornerstones of medical assessment but parts of it are nearly impossible to do while wearing protective equipment. In this brief report we demonstrate a novel wireless stethoscope and its use for treating suspected and proven COVID-19 patients, as a representative to other infectious diseases.”

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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