

COVID-19 Scientific Advisory Group Rapid Response Report

Key Research Question: What is the optimal strategy for healthcare worker clothing and personal items across various health care settings to reduce the risk of HCW self-contamination and to reduce the risk of healthcare workers transmitting viruses outside the hospital?

Context

- Versions of the question are being asked by clinicians of all types across Alberta.
- Related considerations include:
 - Should regular clothes or scrubs be worn?
 - Are hair coverings required?
 - Are booties required?
 - How should personal items be cleaned?
 - What showering practice is recommended?
- Answering these questions will help healthcare provider's address concerns about how to reduce COVID-19 transmission.
- This document was created with reference to the Infection Prevention and Control draft

Key Messages from the Evidence Summary

1. Expert guidelines note that Covid-19 can be transferred from surfaces to hands, and infect persons who touch their mouths, noses or (possibly) eyes.
2. Little evidence exists specifically addressing the risk of COVID-19 transmission by way of healthcare workers clothes or personal items.
3. Research on disease transmission by way of objects and attire is impaired by ethical and methodological issues.
4. Infection Prevention and Control guidelines on handling of clothing and personal items are available for healthcare staff, and reflect the current understanding of COVID-19 disease transmission as well as literature regarding contamination of clothing with pathogens. However, these are practical guidelines rather than guidelines with a firm evidence base.

Considerations (These are highlights copied from Infection Prevention and Control Guidelines - COVID-19 Home Life and Personal Concerns for Health Care Workers)

1. If department policies and emerging public health directives vary from the general considerations below, refer to, and follow those policies and directives.
2. Avoid contamination of clothing during care and contact with suspected or confirmed COVID-19 patients by following infection prevention and control measures. Washable uniforms and clothing is preferred.

- In addition to routine practices, recommended for all patients at all times, including [hand hygiene](#), and [point of care risk assessment](#) prior to each patient contact, use [contact and droplet](#) precautions, when caring for a patient with suspected or confirmed COVID-19, including a procedure mask, gown, eye protection and gloves. Note: N95 respirators are not required unless performing [aerosol generating medical procedures \(AGMP\)](#) that can cause droplets from the nose or mouth to become airborne.
 - Review the [PPE checklist](#) and the proper procedures for [donning](#) and [doffing](#) of PPE.
 - Hair coverings and shoe coverings are not required for contact and droplet precautions. Disposable bouffants and shoe coverings, if worn, should be discarded after use. Other hair coverings, e.g., worn for personal reasons, should be laundered as per the healthcare attire recommendations.
3. Do not access items such as cell phones from pockets while wearing PPE as this undermines the purpose of the PPE.
 4. Follow IPC [Healthcare Attire](#) recommendations guidance for wearing and laundering of uniforms. IPC measures are adequate to prevent contamination; however, if uniforms or clothing are soiled, staff should change out of them before leaving their place of work.
 5. If you change at work or upon reaching home, it is reasonable to transport the clothes you have changed out of in either a disposable plastic bag or washable cloth bag which can be laundered with the clothing
 6. AHS provided [ready to use disinfectant wipes](#) are effective to clean hard surfaces and kill the virus. Without cleaning, COVID-19 is viable on hard surfaces (e.g., stainless steel, plastic, glass) for hours to several days. For more details refer to IPC [Environmental Cleaning Principles](#) and [Cleaning Computers and Electronic Devices](#)
 7. Clean and disinfect medical and personal accessories with [ready-to-use disinfectant wipes](#) . For example,
 - Reusable stethoscopes should be cleaned and disinfected between patients (and minimize use of stethoscope unless clinically necessary),
 - Personal accessories such as nametags should be cleaned if soiled or in contact with the patient environment.
 8. Any of the following household products are effective for cleaning hard surfaces at home: Refer to AHS IPC information, section about [non-critical medical devices](#):
 - Bleach 0.5% sodium hypochlorite; diluted according to the product label is sufficient for disinfecting household items, e.g., 3 tablespoons of bleach to 4L of water).
 - Commercial benzalkonium chloride (Lysol, Mr. Clean, Vim, etc., antibacterial products)
 - Hydrogen peroxide
 - >70% alcohol
 9. Staff showering and bathing practices are not considered important IPC measures for COVID-19, and staff are advised to follow their usual personal hygiene practices.

Other Considerations noted by the Scientific Advisory Group for individuals:

1. Hand hygiene is key to infection prevention and control.

2. The evolving practice of healthcare workers showering, bathing, or washing exposed skin areas at the sink with soap and water upon returning home seems reasonable but there is no evidence suggesting this is necessary.

Committee discussion

There was consensus among the committee about these recommendations.

Guidelines Documents

The World Health Organization states that booties are not required personal protective equipment for COVID-19 (World Health Organization 2020a). Hoods, neck covering and hair coverings are not among the personal protective equipment recommended by the World Health Organization (World Health Organization 2020b). Government of Canada (2020a) personal protective equipment guidelines list only masks and gloves.

Summary of Evidence

COVID-19 may be transmitted from contaminated surfaces to persons who touch those surfaces and transfer the virus to their mouth, nose or (possibly) eyes (Centres for Disease Control 2019; Ong 2020; World Health Organization 2020b; Government of Canada 2020b). Attire can be contaminated with pathogens (Stephens 2019; Haun 2016; Bearman 2014; Mitchell 2015; Munoz-Price 2012).

Virus transfer from healthcare worker attire to hands has been demonstrated (Cassanova 2008). A number of studies have demonstrated transfer of microbes from other surfaces to hands (Stephens 2019). A 2016 systematic review (Haun 2016) included 72 studies and found microbe contamination rates varied across a number of items including ties, white coats, stethoscopes and cell phones, ranging from 0 to 32%. Only 4 studies evaluating “connection between healthcare personnel contaminants and clinical isolates with no unequivocally direct link identified (Haun 2016; see also, Stephens 2019; Emergency Clinical Research Institute [ECRI] 2018; Bearman 2014). Most studies in this area report on surrogate measures such as bacterial load on objects and surfaces, employ literature based computer models or rely on “natural experiments” examining infection rates and environmental contamination (Stephens 2019). Research in this area is hampered by difficulty in disentangling direct contact transmission from other transmission routes (Stephens 2019).

A literature based computer modeling study on disease transmission by way of objects finds that objects are an important pathway for influenza, rhinovirus, and norovirus (Kraay 2018). Xiao and colleagues (2017) modeled scenarios of severe acute respiratory syndrome (SARS) using data from a 2003 Hong Kong outbreak and clinical assumptions. They concluded that contaminated objects likely played a “non-negligible” role in transmission. A modelling study by Sze and colleagues (2014) concluded that fabrics likely contribute less to virus transmission (Rhinovirus and RSV) than non-fabric surfaces.

Wong (2015) examined epidemiology of 185 cases of Middle East Respiratory Illness (MERS-COV) in Hong Kong and concluded that contaminated objects may explain infection in the absence of direct contact, within healthcare settings.

The highest quality evidence would come from human experimental studies, which present ethical issues (Stephens 2019). In a non-systematic review of 142 sources, Stephens and colleagues identified a single experimental study that had tested the role of objects in disease transmission (Stephens 2019). Dick and colleagues (1987) measured spread of rhinovirus by way of objects (playing cards) and found no difference in spread to healthy subjects behaving normally and those who were restrained from touching their faces by way of a harness (summarized in Stephens 2019, not directly reviewed).

No literature was identified comparing scrubs to regular clothes.

No evidence on showering practices was identified.

Evolving Evidence and Review Limitations

- New evidence could emerge on this topic.
- Rapid turnaround time afforded limited time to conduct a thorough search and review of the research and grey literature.
- Infection Prevention and Control guidance on laundry and hard surface cleaning is accepted as effective in countering virus contamination. Literature on effectiveness of laundry practices and cleaners is beyond the scope of this rapid review.
- Literature on scrubs made from anti-microbial fabrics has not been included in this rapid review.

Date question received by advisory group: March 31, 2020

Date report submitted to committee: April 1, 2020

Date of first assessment: April 3, 2020

(If applicable) Date of re-assessment:

Authorship & Committee Members

This report was written by Patrick McLane and Jenine Leal and scientifically reviewed by Shelley Duggan, Nelson Lee, Joseph Kim (external reviewer), and James Kellner (external reviewer). The full Scientific Advisory Group was involved in discussion and revision of the document: Braden Manns (co-chair), Lynora Saxinger (co-chair), John Conly, Alexander Doroshenko, Nelson Lee, Andrew McRae, Jeremy Slobodan, James Talbot, Brandie Walker, and Nathan Zelyas.



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Research Question • 5

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Appendix

Abbreviations

AHS Alberta Health Services
IPC Infection Prevention and Control
PPE Personal Protective Equipment

Literature Search Details (include as much as you can)

Ovid MEDLINE® and In-Process & Other Non-Indexed Citations and Daily 1946 to March 30, 2020

Knowledge Resource Service

1 exp Coronavirus/ or exp Coronavirus Infections/ or coronaviru*.mp. or "corona virus*".mp. or ncov*.mp. or n-cov*.mp. or COVID-19.mp. or COVID19.mp. or COVID-2019.mp. or COVID2019.mp. or SARS-COV-2.mp. or SARSCOV-2.mp. or SARSCOV2.mp. or SARSCOV19.mp. or Sars-Cov-19.mp. or SarsCov-19.mp. or SARSCOV2019.mp. or Sars-Cov-2019.mp. or SarsCov-2019.mp. or "severe acute respiratory syndrome cov 2".mp. or "2019 ncov".mp. or "2019ncov".mp.
18987

2 exp Clothing/ 26598

3 exp Hair/ 34777

4 clothing/ or shoes/ or glass/ or jewelry/ 33060

5 Eyeglasses/ 7546

6 Cell Phone/ 8333

7 (Cloth* or scrub or scrubs or garment* or Hood* or hair covering* or Boot* or shoe* or Personal item* or purse* or wallet* or cell phone* or cellphone* or cellular phone* or mobile phone* or jewelry or glasses or eyeglasses or spectacles).kf,tw.

83649

8 or/2-7 159814

9 1 and 8 97

10 limit 9 to (english language and yr="2003 -Current") 85

11 exp Health Personnel/ 505651

12 (healthcare or health care or medic* or nurs* or allied health or therap* or consultant* or technic* or technolog*).mp.

9209977

13 11 or 12 9316480

14 10 and 13 52

LitCovid

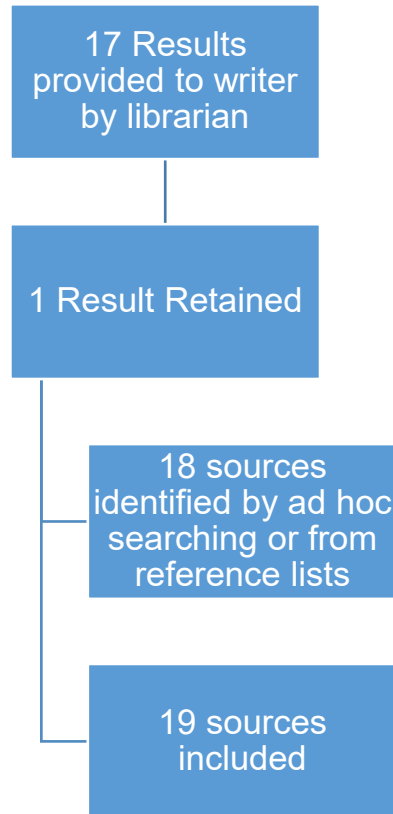
Terms used: clothing, clothes, hair,

[TRIP PRO](#) / [Google Scholar](#) / [Google](#)

(Cloth* or scrub or scrubs or garment* or Hood* or hair covering* or Boot* or shoe* or Personal item* or purse* or wallet* or cell phone* or cellphone* or cellular phone* or mobile phone* or jewelry or glasses or eyeglasses or spectacles) AND healthcare workers AND contamination AND ("covid-19" OR coronavirus OR "novel coronavirus" OR "new coronavirus" OR "coronavirus infection" OR Ncov-19 OR sars-cov-19 OR Sars-Cov-2 OR "corona virus" OR

“severe acute respiratory syndrome coronavirus” OR “sars coronavirus” OR wuhan)

Figure 1: PRISMA Diagram



- PRISMA Citation:
Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). *Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement*. [PLoS Med 6\(7\): e1000097. doi:10.1371/journal.pmed1000097](https://doi.org/10.1371/journal.pmed1000097)

Table 1. Inclusion and exclusion criteria for results of the literature search

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> - Guidelines and credible academic writing related to transmission of illness through vectors such as clothes, shoes, personal items or healthcare provider body. 	<ul style="list-style-type: none"> - News articles. - Opinion pieces. - Sources focused on PPE (e.g. gloves, mask) rather than clothing and personal items. - Language other than English.

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