

COVID-19 CADTH Reference List

# Respirator Device Fit for Individuals With Facial Hair

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To produce this report, CADTH used a modified approach to the selection, appraisal, and synthesis of the evidence to meet decision-making needs during the COVID-19 pandemic. Care has been taken to ensure the information is accurate and complete, but it should be noted that international scientific evidence about COVID-19 is changing and growing rapidly.

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**Authors:** Holly Gunn, Hannah Loshak

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## Key Messages

- Two non-randomized studies were identified regarding facial hair and filtering respirator devices (e.g., N95 masks).
- No recommendations were identified regarding facial hair and filtering respirator devices (e.g., N95 masks).

## Research Questions

1. What is the clinical evidence regarding facial hair and filtering respirator devices (e.g., N95 masks)?
2. What are the recommendations regarding facial hair and filtering respirator devices (e.g., N95 masks)?

## Methods

### Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were facial hair and masks or COVID-19. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English-language documents published between January 1, 2016 and January 26, 2021. Internet links were provided, where available.

### Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings section was based on information available in the abstracts of selected publications. Open-access, full-text versions of evidence-based guidelines were reviewed when abstracts were not available and relevant recommendations were summarized.

**Table 1: Selection Criteria**

Criteria	Description
<b>Population</b>	Any individual (health care provider, patient, general public) required to wear respirator devices (e.g., N95 masks, supplied air respirators [excluding standard medical, cloth, or surgical masks]) in any setting
<b>Intervention</b>	Wearing respirator devices with facial hair (e.g., beards, moustaches, stubble)
<b>Comparator</b>	Wearing respirator devices with no facial hair or different styles of facial hair
<b>Outcomes</b>	Q1: Reduced aerosol droplet or particle transmission (e.g., COVID-19 transmission), safety, harms, infection rate, fit of mask Q2: Recommendations regarding facial hair and filtering respiratory devices such as N95 masks
<b>Study designs</b>	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, evidence-based guidelines

COVID-19 = novel coronavirus disease 2019.

## Results

Two non-randomized studies<sup>1,2</sup> were identified regarding facial hair and filtering respirator devices (e.g., N95 masks). No health technology assessments, systematic reviews, or randomized controlled trials were identified regarding facial hair and filtering respirator devices (e.g., N95 masks). Furthermore, no evidence-based guidelines were identified regarding facial hair and filtering respirator devices (e.g., N95 masks).

Additional references of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

## Overall Summary of Findings

Two non-randomized studies<sup>1,2</sup> were identified regarding facial hair and filtering respirator devices (e.g., N95 masks). The authors of both studies<sup>1,2</sup> reported that, as beard length increased, the adequacy of respiratory fit decreased significantly. Furthermore, the authors of the first study<sup>1</sup> reported that no full-bearded health care workers achieved a fit with a respirator. The authors of the second study<sup>2</sup> found that as beard length surpassed 0.125 inches, the fit factor decreased significantly. However, the authors did report that fit factor for individuals with a stubble was not significantly different than individuals with a clean shave.<sup>2</sup>

## References

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

No literature identified.

### Randomized Controlled Trials

No literature identified.

### Non-Randomized Studies

1. Sandaradura I, Goeman E, Pontivivo G, et al. A close shave? Performance of P2/N95 respirators in healthcare workers with facial hair: results of the BEARDS (BEnchmarking Adequate Respiratory DefenceS) study. *J Hosp Infect.* 2020;104(4):529-533. [PubMed: PM31978416](#)
2. Floyd EL, Henry JB, Johnson DL. Influence of facial hair length, coarseness, and areal density on seal leakage of a tight-fitting half-face respirator. *J Occup Environ Hyg.* 2018;15(4):334-340. [PubMed: PM29283316](#)

### Guidelines and Recommendations

No literature identified.

## Appendix 1: References of Potential Interest

### Previous CADTH Reports

3. Masks during aerosol generating ENT procedures: clinical effectiveness and guidelines (*CADTH Rapid response report: reference list*). Ottawa (ON): CADTH; 2020: <https://covid.cadth.ca/infection-control/masks-during-aerosol-generating-ent-procedures-clinical-effectiveness-and-guidelines/>. Accessed 2021 Feb 3.
4. Masks during aerosol-generating dental procedures: clinical effectiveness and guidelines (*CADTH Rapid response report: reference list*). Ottawa (ON): CADTH; 2020: <https://covid.cadth.ca/infection-control/masks-during-aerosol-generating-dental-procedures-clinical-effectiveness-and-guidelines/>. Accessed 2021 Feb 3.

### Non-Randomized Studies

#### Alternate Intervention, No Comparator

5. Singh R, Safri HS, Singh S, et al. Under-mask beard cover (Singh Thattha technique) for donning respirator masks in COVID-19 patient care. *J Hosp Infect*. 2020;106(4):782-785. [PubMed: PM33022336](#)

### Guidelines and Recommendations

#### Methodology Not Specified

6. Guidance on the minimum recommendations for the use of personal protective equipment (PPE) in hospitals during the COVID-19 outbreak. Canberra (AU): Australian Government; 2020: <https://www.health.gov.au/sites/default/files/documents/2020/11/guidance-on-the-use-of-personal-protective-equipment-ppe-in-hospitals-during-the-covid-19-outbreak.pdf> Accessed 2021 Jan 28.  
*See: Fit-checking is the minimum standard for each occasion of use of a PFR, p.7*
7. Interim infection prevention and control guidelines for the management of COVID-19 in healthcare settings. Brisbane (AU): Queensland Government; 2020: [https://www.health.qld.gov.au/\\_data/assets/pdf\\_file/0038/939656/qh-covid-19-infection-control-guidelines.pdf](https://www.health.qld.gov.au/_data/assets/pdf_file/0038/939656/qh-covid-19-infection-control-guidelines.pdf). Accessed 2021 Feb 3.  
*See: Airborne and contact transmission-based precautions, p.10-11*
8. Health and Safety Executive UK. Guidance on respiratory protective equipment (RPE) fit testing; 2019: <https://www.hse.gov.uk/pubns/indg479.pdf>. Accessed 2021 Feb 3.  
*See: Preparing the wearer, p.7*

### Review Articles

#### Not Peer-Reviewed

9. Burton C, Coles B, Adisesh A, et al. Performance and impact of disposable and reusable respirators for healthcare workers during pandemic respiratory disease: a rapid evidence review [non peer-reviewed preprint]. *medRxiv*;2020: doi. 10.1101/2020.05.21.20108233. <https://www.medrxiv.org/content/10.1101/2020.05.21.20108233v1>. Accessed 2021 Feb 3.

### Additional References

10. Centers for Disease Control and Prevention. To beard or not to beard? That's a good question!; 2017: <https://blogs.cdc.gov/niosh-science-blog/2017/11/02/noshave/> Accessed 2021 Jan 28.
11. National Institute for Occupational Safety and Health. Filtering out confusion: frequently asked questions about respiratory protection; 2018: <https://www.cdc.gov/niosh/docs/2018-129/pdfs/2018-129.pdf?id=10.26616/NIOSH PUB2018129>. Accessed 2021 Jan 28.
12. WorkSafeBC. Personal protective equipment (PPE): facial hair and respirators. <https://www.worksafebc.com/en/resources/health-safety/ppe-information-sheets/facial-hair-and-respirators?lang=en&direct> Accessed 2021 Jan 28.