

Best practice is to use new N95s. Decontamination does not solve the PPE shortage crisis, and is an emergency practice to be considered during the COVID-19 pandemic. Efficacy and safety of N95 decontamination has not been fully characterized.

# COVID N95 DECON & REUSE



## UV-C

Use appropriate UV-C source  
Validate 1.0 J/cm<sup>2</sup> dose with sensor  
Expose both sides of N95 mask

## CORONAVIRUS INACTIVATION

Peer-reviewed data not available for SARS-CoV-2

- +**  $\geq 1.0 \text{ J/cm}^2$  of UV-C inactivates\* viruses similar to SARS-CoV-2 on N95 FFRs<sup>1,2\*\*,3</sup>
- $\geq 1.0 \text{ J/cm}^2$  of UV-C yields 2-log reduction of viable *B. subtilis* spores on N95 FFRs<sup>4</sup>
- UV-C light may not reach inner N95 layers for all N95 models<sup>5</sup>
- Elastic straps require additional chemical disinfection<sup>1</sup>
- Shadows can block UV-C rays & can leave parts of N95 contaminated

\*  $\geq 3$ -log inactivation

## KEY CONSIDERATIONS

- Ensure accurate UV-C dose on all surfaces of N95
- Measure dose at N95 surface with UV-C specific sensor
- Return N95s to original users and ensure handling minimizes cross-contamination
- Perform user seal check before each reuse
- Be aware that data from tests on specific N95 models may not apply to other models

## N95 INTEGRITY

- +** N95 keeps fit and filter performance after 10-20 cycles of 1.0-1.2 J/cm<sup>2</sup> UV-C<sup>2\*\*,6</sup>
- Each don/doff can reduce N95 fit; some models fit unacceptably after 5 don/doff cycles<sup>9</sup>
- Some damage to N95 seen at high UV-C doses ( $\geq 120 \text{ J/cm}^2$ )<sup>6</sup>
- Strap and facepiece damage seen on some N95 models after UV-C<sup>7\*\*,8</sup>

## RISKS

- UV light is harmful to eyes and skin;** proper training, engineering controls, and PPE are required before use
- If UV-C source is underpowered, decontamination times may be infeasible
- UV-C may not decontaminate N95 straps or eliminate risk of bacterial co-infection
- Cosmetics and sunscreen on N95 may reduce decontamination efficacy
- Non-uniform irradiance can affect dose, and subsequently, decontamination efficacy

## IMPLEMENTATION

- +** Reference documents from University of Nebraska Medical Center<sup>8</sup> for implementation
- ?** Validate each UV-C source and protocol with a UV-C sensor to ensure adequate dose for decontamination at the N95 surface

## CONCLUSION

If implemented properly using sensors to ensure  $\geq 1.0 \text{ J/cm}^2$  UV-C dose to the N95, this method likely inactivates SARS-CoV-2; however, this has not yet been confirmed directly with SARS-CoV-2. This method may protect against some bacterial co-infection risks but not all.

## SUPPORTING RESEARCH

[1] Mills et al., 2018; [2] Heimbuch & Harnish, 2019\*\*; [3] Lore et al., 2012; [4] Lin et al., 2018; [5] Fisher and Shaffer, 2010; [6] Lindsley et al., 2015; [7] Personal Safety Division, 3M, 2020\*\*; [8] Lowe et al., 2020; [9] Bergman et al., 2012  
\*\* = not peer-reviewed

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