

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
Use sensor to validate 1 J/cm² dose
Expose both sides of N95 mask

CORONAVIRUS INACTIVATION

Data not available for COVID-19

- +** • $\geq 1 \text{ J/cm}^2$ of UV-C inactivates viruses similar to SARS-CoV-2 on N95s^{1,2,3}
- $\geq 1 \text{ J/cm}^2$ of UV-C kills *Bacillus subtilis* spores on N95s⁴
- • UV-C light may not reach inner N95 layers for all N95 models⁵
- Straps may not be fully decontaminated by UV-C alone¹
- Shadowing blocks UV-C rays & can leave parts of N95 contaminated

N95 MASK INTEGRITY

- +** • N95 keeps fit and filter performance after 10-20 cycles of 1-1.2 J/cm² UV-C²
- • Some damage to N95 seen at high UV-C doses ($\geq 120 \text{ J/cm}^2$)⁶
- Strap and facepiece damage seen on some N95 models after UV-C⁷

KEY CONSIDERATIONS

- Ensure accurate UV-C dose on front and back of N95
- Measure dose at N95 surface with calibrated sensor
- Keep N95s separate and return to original users
- Perform user seal check before each reuse
- Be aware that data from tests on specific N95 models may not apply to other models

RISKS

- Residual contamination may remain on N95 straps and may need to be separately wiped with disinfectant
- Consumer UV products are not recommended for N95 decontamination
- If UV-C source is underpowered, decontamination timescales may be infeasible
- UV-C may not decontaminate N95 straps or eliminate risk of bacterial co-infection
- Makeup and sunscreen on N95 may reduce decontamination efficacy

IMPLEMENTATION

- +** • Reference documents from University of Nebraska Medical Center⁸ 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 $\geq 1 \text{ J/cm}^2$ 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; [8] Personal Safety Division, 3M, 2020; [9] Lowe et al., 2020

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