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/cm^2 dose

Expose both sides of N95 mask

CORONAVIRUS INACTIVATION

Data not available for COVID-19

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- ≥1 J/cm^2 of UV-C inactivates viruses similar to SARS-CoV-2 on N95s[1,2,3]
- ≥1J/cm^2 of UV-C kills *Bacillus subtilis* spores on N95s[4]

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- UV-C light may not reach inner N95 layers for all N95 models[5]
- Straps may not be fully decontaminated by UV-C alone[1]
- Shadowing blocks UV-C rays & can leave parts of N95 contaminated

N95 MASK INTEGRITY

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- N95 keeps fit and filter performance after 10-20 cycles of 1–1.2 J/cm^2 UV-C[2]

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- Some damage to N95 seen at high UV-C doses (≥120 J/cm^2)[6]
- Strap and facepiece damage seen on some N95 models after UV-C[7]

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

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- Reference documents from University of Nebraska Medical Center[8] for implementation

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- 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 ≥1J/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