

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



# HYDROGEN PEROXIDE

## CORONAVIRUS INACTIVATION

- + Hydrogen peroxide inactivates SARS-CoV-2 on all N95 mask types tested<sup>1,2</sup>
- Hydrogen peroxide inactivates viruses and highly-resistant bacterial spores<sup>3</sup>
- Hydrogen peroxide systems differ in dosing and effects

## KEY CONSIDERATIONS

Hydrogen peroxide is incompatible with cellulose, which is a component of some N95 FFRs

Data from specific N95 models may not apply to other models

FDA EUAs require return to original user except for the Battelle process<sup>5</sup>

Each don/doff can reduce N95 fit; some models lose fit after 5 don/doff cycles, others after > 15 cycles<sup>6</sup>

N95 user seal check should be performed before each reuse

## N95 MASK INTEGRITY

- + HPV (Battelle) for up to 20 cycles does not degrade filter quality or straps for 3M 1860<sup>4</sup>
- VHP (Steris) for up to 10 cycles does not degrade N95 filter quality<sup>5</sup>

## RISKS

Insufficient off-gas time and residue may pose a respiratory and skin hazard

Some HPGP protocols reduce filtration efficiency

Insufficient dosing may lead to insufficient decontamination

Hydrogen peroxide is a powerful oxidizer and presents a combustion and explosion risk

HPV and HPGP systems are dangerous if manufacturer guidelines are not carefully followed

## IMPLEMENTATION



- VHP, HPV/HPVP, HPGP, iHP, and aHP refer to different methods with varying effects on N95s
- CDC released guidance on HPV for decontaminating N95s<sup>7</sup>
- Some hydrogen peroxide systems have received FDA emergency use authorization<sup>5</sup>
- Hospitals have developed SOPs for HPV and VHP<sup>8</sup>



- Hydrogen peroxide processes can be dangerous and require trained personnel

## CONCLUSION

If implemented properly, and N95 masks are not soiled, it is likely that all of the standard hospital decontamination protocols for HPV/HPVP, VHP, HPGP, iHP and aHP will inactivate SARS-CoV-2 and bacterial spores. Decontamination durations and maximum recommended reuse cycles are extremely different among these methods and misapplication can result in failure to decontaminate and/or failure of N95 mask filtration or fit.

**SUPPORTING RESEARCH** [1\*\*] Kumar et al., 2020; [2\*\*] Oral et al., 2020; [3] Heckert et al., 1997; [4] Battelle, 2016; [5] FDA EUA (2020): Battelle, Steris, STERRAD; [6] Bergman et al., 2012; [7] CDC, 2020; [8\*\*] n95decon.org/example-processes

\*\* = not peer-reviewed

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