

Ultraviolet-C (UV-C) monitoring *made ridiculously simple:* UV-C dose indicators for convenient measurement of UV-C dosing

Jennifer L. Cadnum, BS¹; Annette L. Jencson, CIC²; Sarah Redmond, MD³; Thriveen Sankar Chittoor Mana, MS³
& Curtis J. Donskey, MD¹⁻³

Contact: Jennifer.Cadnum@VA.gov

Follow The CLEan Team @CLE_Cleans

Poster #1215

Background

- Ultraviolet-C (UV-C) light is increasingly used as an adjunct to standard cleaning in healthcare facilities
- Most facilities do not have a means to measure UV-C to determine if effective doses are being delivered
- We tested the efficacy of 2 easy-to-use colorimetric indicators for monitoring UV-C dosing in comparison to log reductions in pathogens

Figure 2. Interpretation of the UV indicators with UV-C dose read based on the color of the central reading window

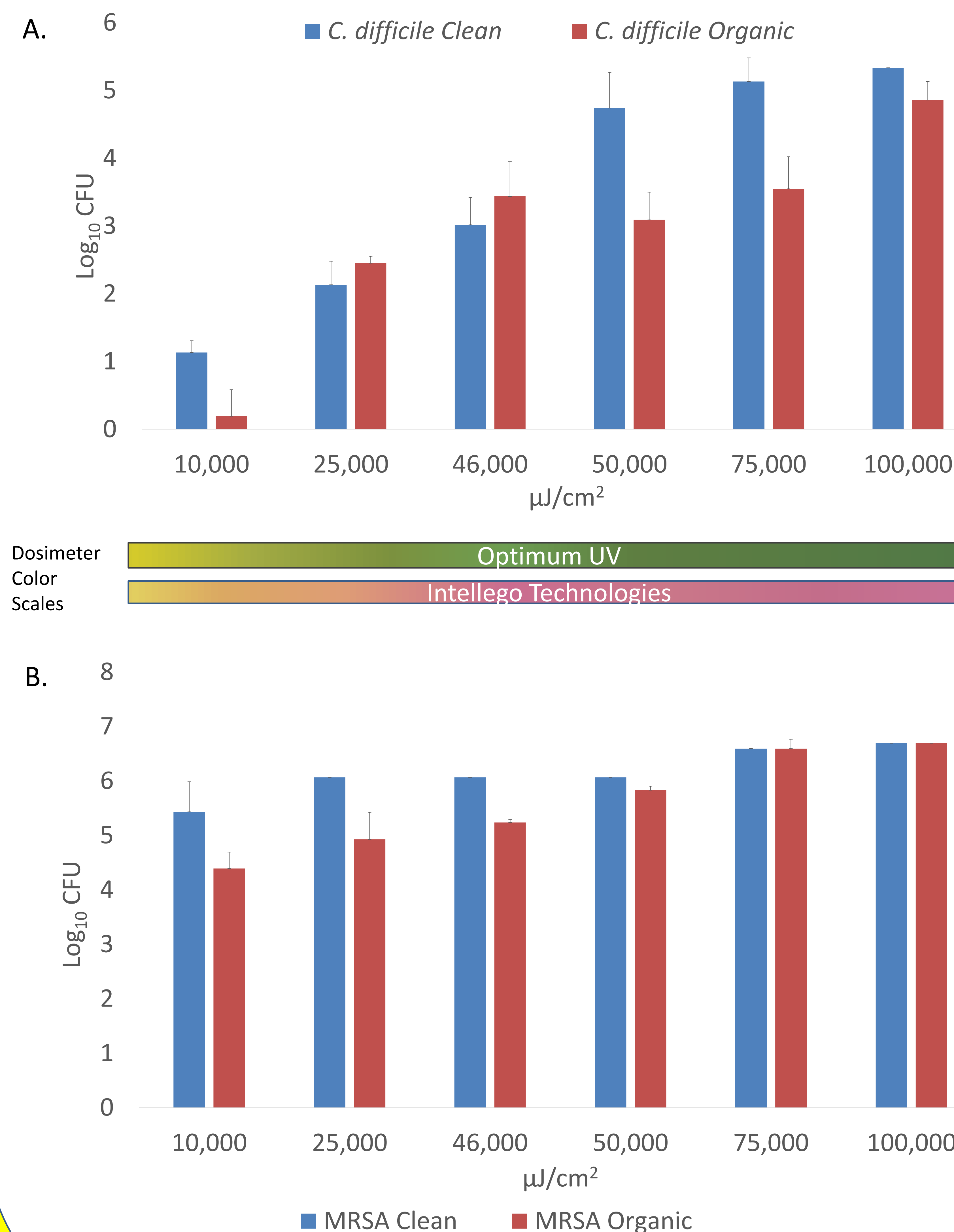


Methods

- In a laboratory setting, we exposed methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridioides difficile* spores on steel disk carriers to UV-C for varying fluence exposures ranging from 10,000 to 100,000 µJ/cm²
- The UV-C indicators were placed adjacent to the carriers
- Change in color of the indicators was correlated with dose and log₁₀ CFU reductions

Results

Figure 1: Reduction of *C. difficile* (A) and MRSA (B) with varying fluence exposures



Results

- The UV-C doses required to achieve a 3-log reduction in MRSA and *C. difficile* were 10,000 and 46,000 µJ/cm², respectively
- For both indicators, there was a visible color change from baseline at 10,000 µJ/cm² and a definite final color change by 46,000 µJ/cm² (Figure 1&2)
- Organic load had only a modest impact on UV-C efficacy
- The indicators required only a few seconds to place and were easy to read (Figure 2)

Conclusions

- UV-C doses of 10,000 µJ/cm² and 46,000 µJ/cm² were required to achieve 3 log reductions of MRSA and *C. difficile* spores, respectively.
- The colorimetric indicators provide an easy means to monitor UV-C dosing.
- Additional studies are needed to evaluate use of the indicators in patient rooms including in shaded areas

Acknowledgement

- We thank The Clorox Company and Intellego Technologies for providing devices for testing
- Providing companies did not have any role in planning or design of the study and no funding was received

