

Portable, Affordable and Adjustable: Evaluation of a Novel Ultraviolet Light Decontamination Device

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Abstract #8045

Background

- Mobile ultraviolet (UV) light room decontamination devices are commonly used as an adjunct to standard cleaning in healthcare facilities
- However, the devices are expensive and can be difficult to transport
- The MoonBeam-3 (Daylight Medical) is a relatively low cost UV device with 3 adjustable heads that is compact and portable (i.e., the device weighs 39 pounds and can be carried by one person)

Objective

- To evaluate the efficacy of the MoonBeam3 compared to the Tru-D room decontamination device against methicillin-resistant *Staphylococcus aureus* (MRSA) and *Clostridium difficile* spores in 5% fetal calf serum on steel disk carriers

Figure 1. MoonBeam3 remote cover & base unit (A), adjustable lamps (B), remote cover outside of room (C)



Table 1. Mean CFU values of organisms recovered before and after treatment in patient rooms with 2 10-minute cycles with the MoonBeam-3

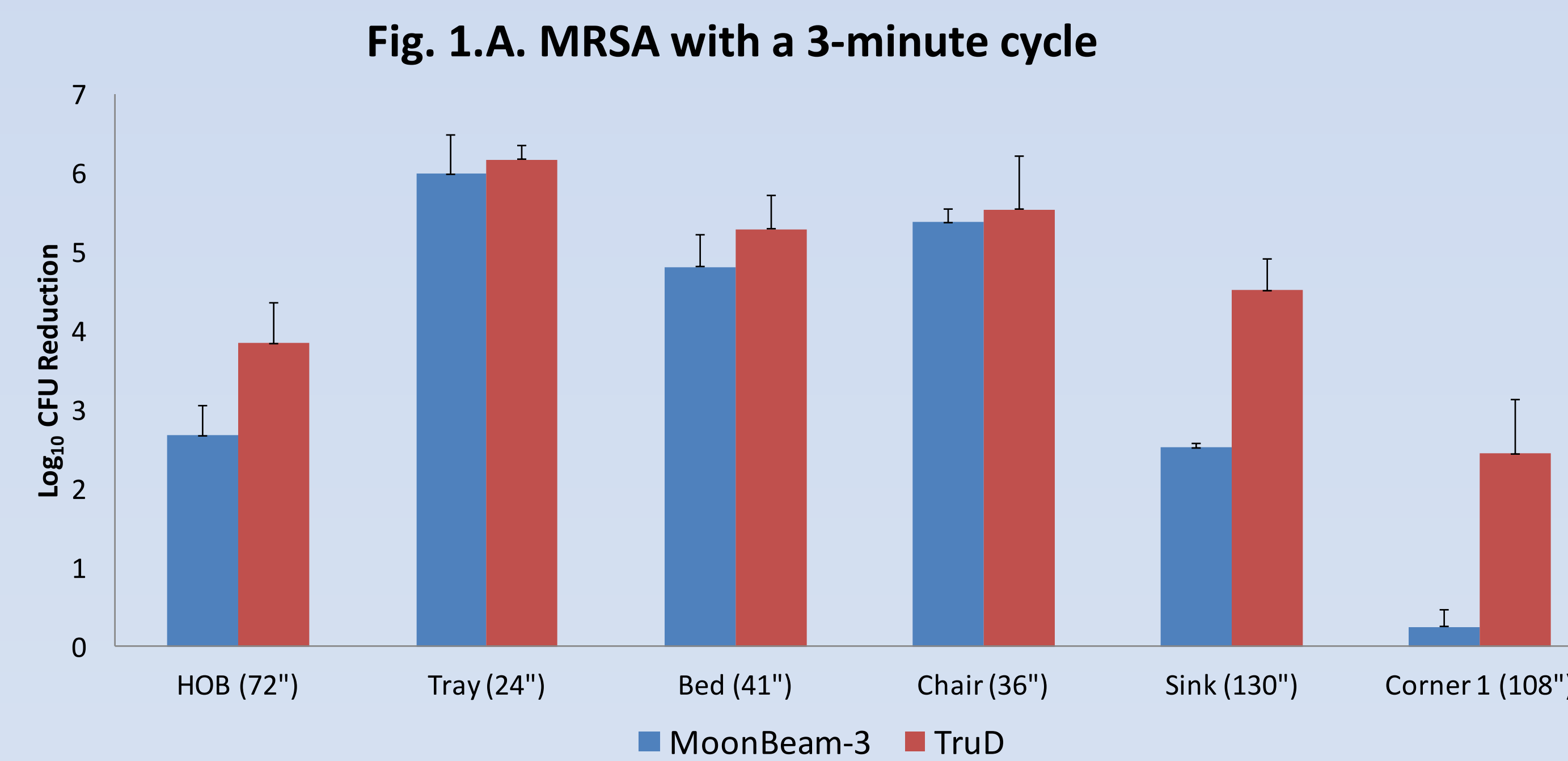
Organism	Average CFU's Recovered								
	Near composite			Far composite			Total Sites		
	Before	After	P-value	Before	After	P-value	Before	After	P-value
<i>Staphylococcus aureus</i>	36.8	3.3	.19	177.0	13.0	.03	127.3	10.8	.02
<i>C.difficile</i> *	Positive	Negative	.32	Positive	Negative	.04	Positive	Negative	.02
Gram Negative Bacteria	1.3	0.0	.06	12.4	1.0	.21	7.4	1.0	.18
Total Aerobes	111.7	31.7	<.05	187.0	25.6	<.05	159.5	27.2	<.05

* *C.difficile* spores cultured by broth enrichment

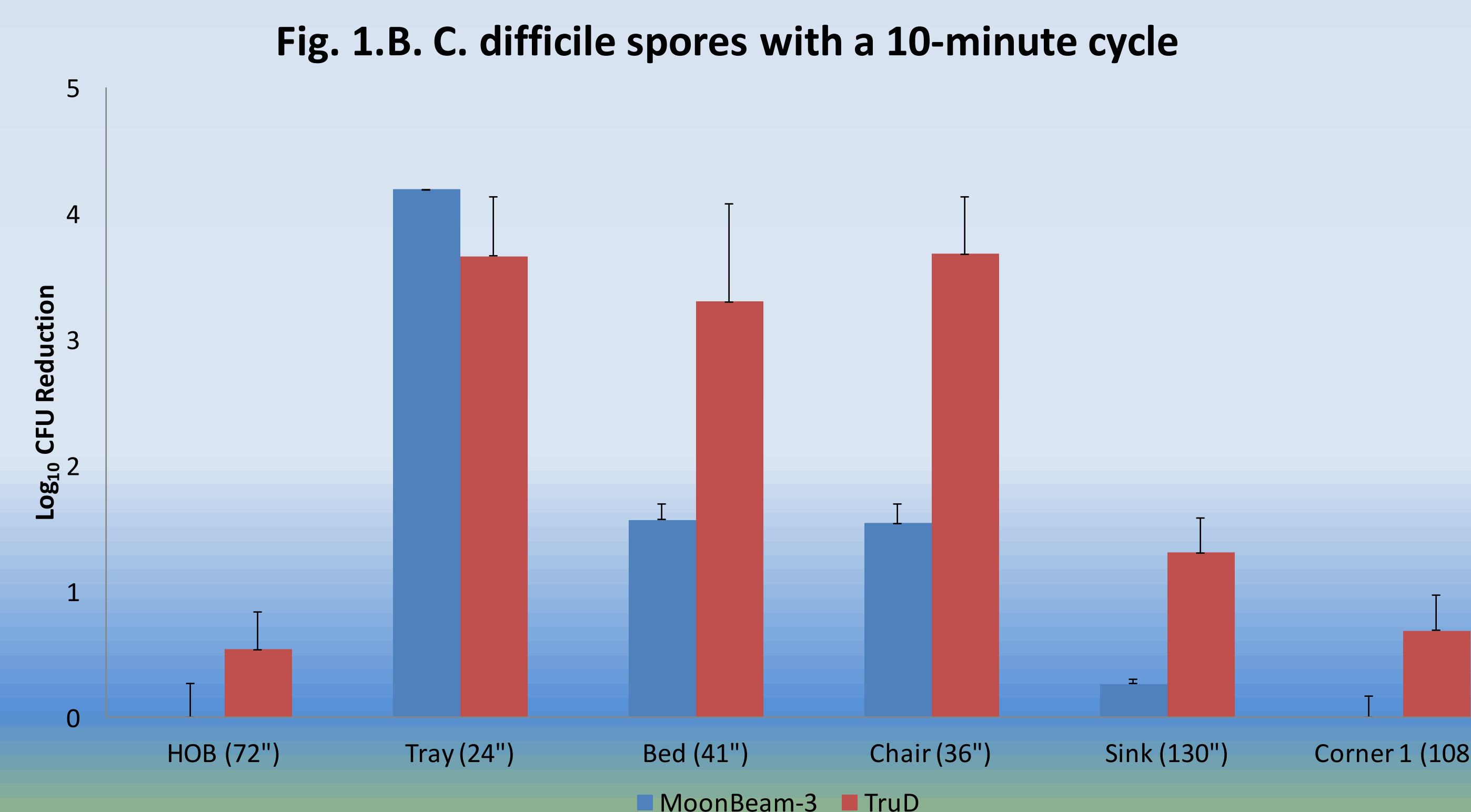
Methods

- MRSA and *C. difficile* spores in 5% fetal calf serum were inoculated on steel disk carriers
- The carriers were placed at various locations in hospital rooms and irradiated for 3 or 10 minutes for MRSA and *C. difficile*, respectively
- Reduction in MRSA and *C. difficile* spores were compared after irradiation with Moonbeam or Tru-D
- For the MoonBeam3, we also evaluated efficacy when one cycle was run at each side of the bed (3 minutes per cycle for MRSA; 10 minutes per cycle for *C. difficile*) and in the bathroom
- We assessed the efficacy of the MoonBeam-3 in patient rooms with one 10-minute cycle run at each side of the bed and in the bathroom

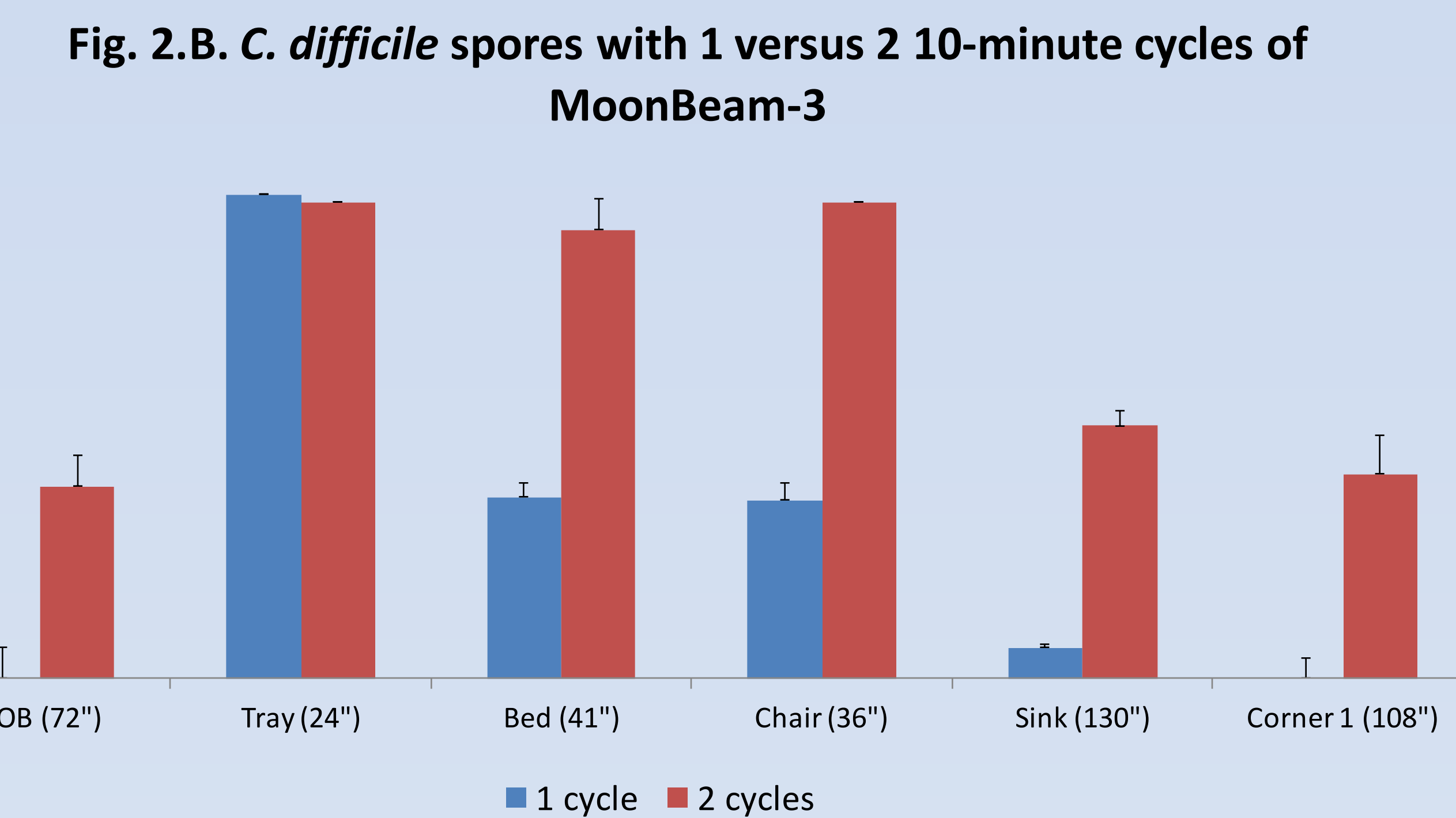
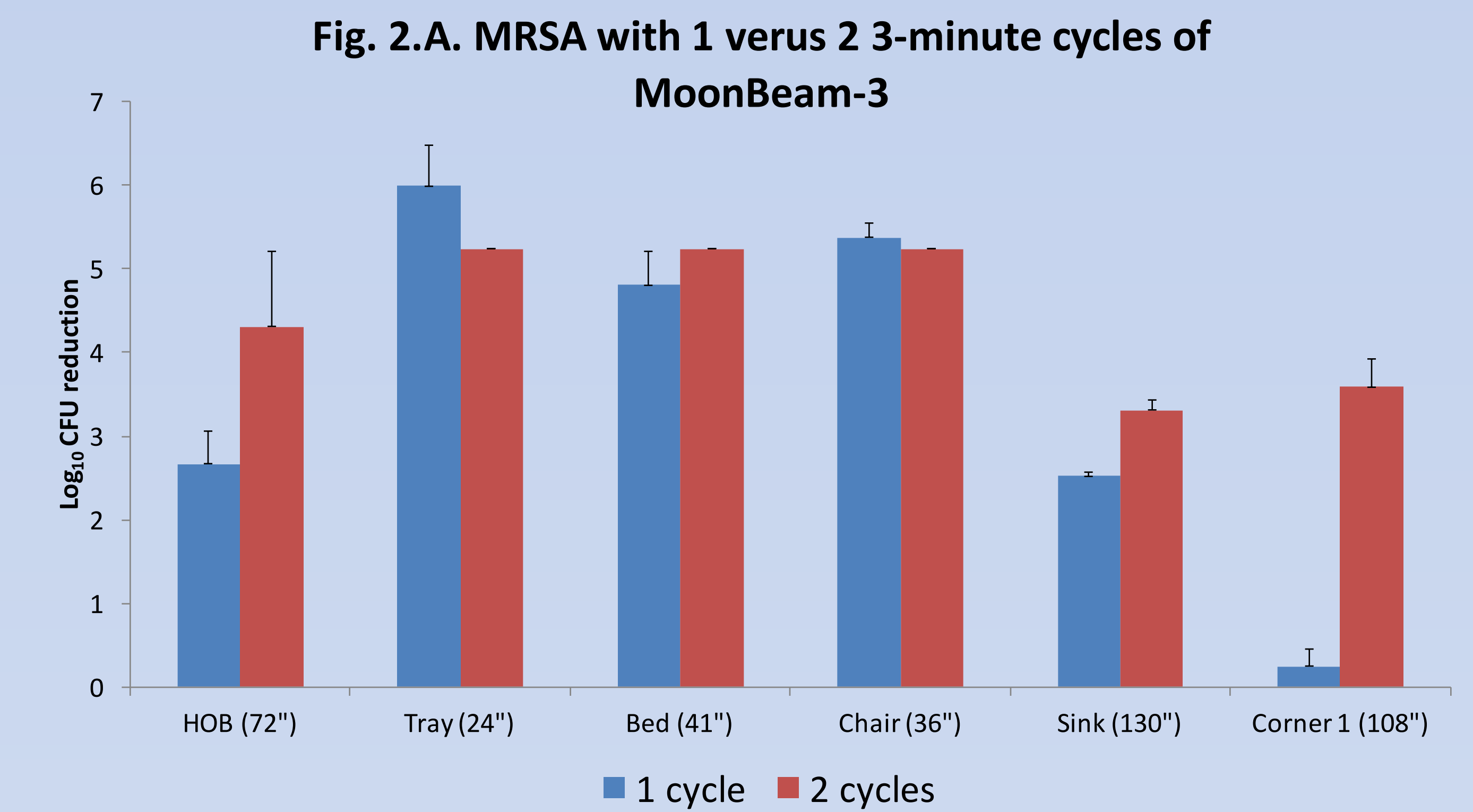
Results



HOB – patient equipment mounted on the wall at the head of the patient bed



Results



Conclusions

- Although less effective than the Tru-D in the orientation tested, the MoonBeam-3 was very effective in closer proximity to the device and in bathrooms
- Operation of the device at 2 locations in hospital rooms resulted in improved reductions at distal locations in the room
- Given the potential advantages of the device in terms of cost and portability, further testing is warranted to assess efficacy in real-world settings

Acknowledgement

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