

# Microbial Transfer to Environmental Surfaces after Simulations of Patient Care

Heba Alhmidi, MD;<sup>1</sup> Sreelatha Koganti, MD;<sup>1</sup> Myreen Tomas, MD;<sup>2</sup> Jennifer Cadnum, BS;<sup>3</sup> Annette Jencson, BSMT, CIC;<sup>1</sup> Thriveen S.C. Mana, MS;<sup>3</sup> Curtis J. Donskey, MD<sup>2,3</sup>

<sup>1</sup>Research Service, Louis Stokes Cleveland Veterans Affairs Medical Center, Cleveland, Ohio <sup>2</sup>Geriatric Research, Education and Clinical Center, Cleveland VA Medical Center, Cleveland, Ohio

<sup>3</sup>Department of Medicine, Division of Infectious Diseases, Case Western Reserve University, Cleveland, Ohio

Abstract 59916

E-mail: Heba.Alhmidi@va.gov

## Background

- Simulations can be valuable to understand dissemination of pathogens
- Bacteriophage MS2 is a benign virus commonly used to model spread of viruses in healthcare and community settings
- We hypothesized that dissemination of bacteriophage MS2 would correlate well with dissemination of *Clostridium difficile* spores

## Methods

- During simulated patient care interactions, we evaluated environmental dissemination of bacteriophage MS2 and *C. difficile* spores inoculated onto a contaminated mannequin
- After healthcare personnel performed physical examinations, surfaces in the simulation room were sampled
- The *C. difficile* colony forming units (CFU) and MS2 plaque forming units (PFU) recovered from surfaces and frequency of contamination was compared

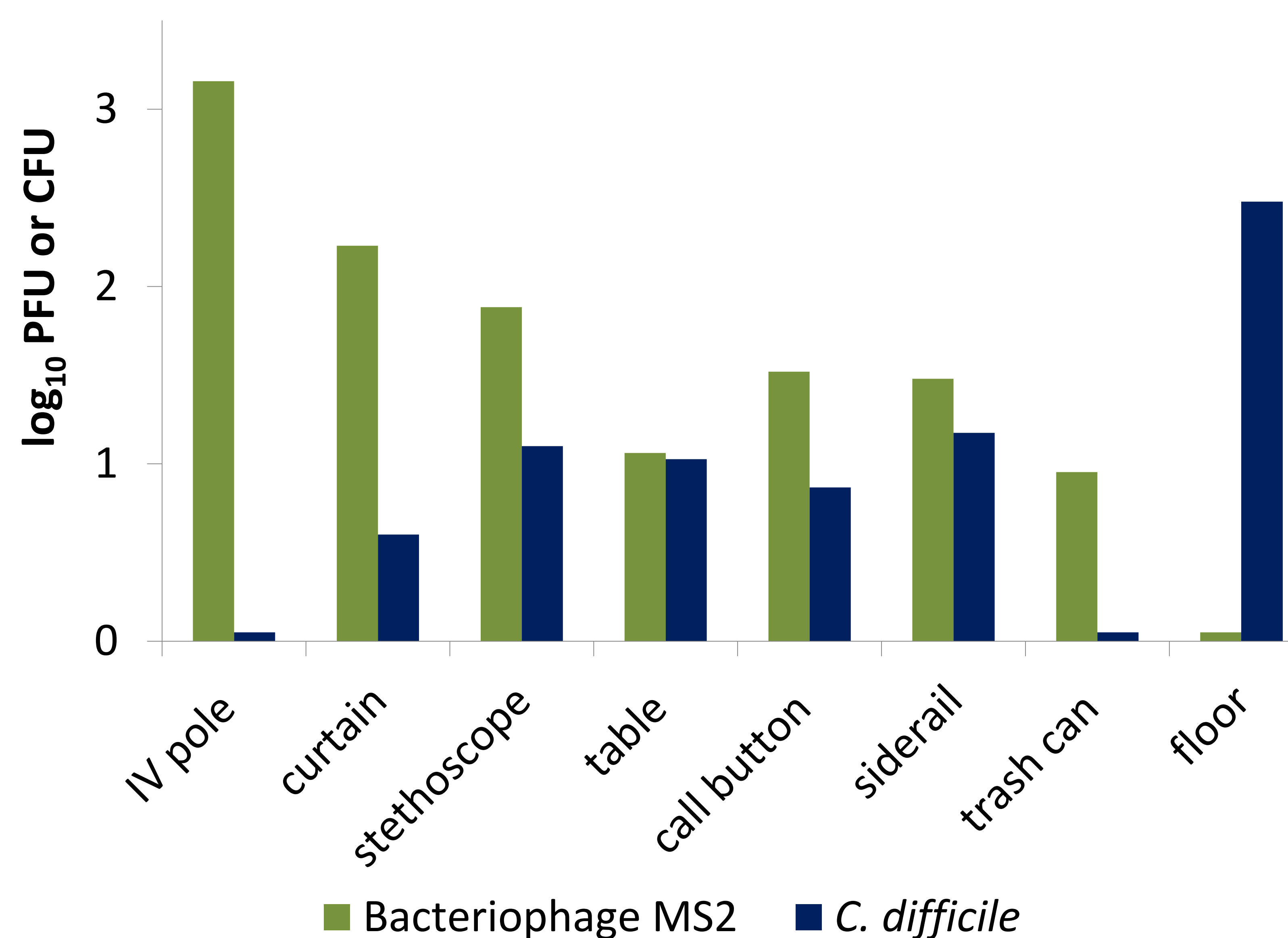
## Methods

Figure 1. Simulation center



## Results

Figure 2. Concentration of Bacteriophage MS2 and *C. difficile* recovered from Surfaces



## Results

- Sixty patient care simulations were performed by healthcare personnel
- There was no difference in frequency of *C. difficile* and MS2 contamination (43% vs 33%,  $P=0.35$ )
- The concentration of MS2 and *C. difficile* on the mannequin decreased to a modest degree after 10 simulations (MS2 4.3 vs 2.7 logs, *C. difficile* 2.3 vs 1.8 logs;  $P>0.05$ )
- Both pathogens disseminated to touched surfaces throughout the room (Figure 2)
- The average concentration of MS2 and *C. difficile* recovered from contaminated surfaces was similar (1.6 vs 1.1 log)

## Conclusions

- Our findings suggest that bacteriophage MS2 may be useful to simulate dissemination of *C. difficile* in the environment