

A dry-mist of hydrogen peroxide is more effective than 0.5% sodium hypochlorite solution in eradicating *C. difficile* spores from rooms occupied by patients infected with *C. difficile*

Study project: In this prospective, randomized study* in two French university hospitals, after patients with *C. difficile* (by stool toxin) were discharged (n=31), their rooms were randomized to be decontaminated with either hydrogen peroxide dry-mist (n=15) or 0.5% sodium hypochlorite solution (n=16). Before decontamination, rooms were cleaned with a detergent-disinfectant and rinsed with tap water. For decontamination with hydrogen peroxide, vacant rooms' doors and windows were closed but not sealed. Diffusion of the hydrogen peroxide dry-mist (Gloster Sante Europe) was followed by a one-hour exposure (one standard cycle). For decontamination with hypochlorite, the solution was manually wiped on surfaces in the rooms.

Twelve or 13 surface samples (toilet seat, bathroom sink, bathroom floor, bedside table, care table, telephone, door handle, chair arm, floor of the main room, windowsill, remote control for the bed, bed barrier, and alcohol-based hand gel dispensers) were collected both before cleaning and after disinfection—a total of 388 samples from hypochlorite-treated rooms and 360 from hydrogen peroxide dry-mist-treated rooms. Samples were used to inoculate culture media for detection of *C. difficile*.

Findings: Before cleaning, *C. difficile* spores were detected in 80 (21%) of 374 samples and 23 (74%) of 31 rooms. Numbers didn't differ significantly between rooms randomized to the two types of decontamination.

After decontamination, *C. difficile* was cultured from 23 (12%) of 194 samples from hypochlorite-treated rooms and 4 (2%) of 180 samples from rooms treated with hydrogen peroxide dry-mist. (See Figure) The decrease in the percentage of samples containing *C. difficile* spores was statistically significantly greater with hydrogen peroxide than hypochlorite.

The percentage of rooms with at least one sample positive for *C. difficile* did not change statistically significantly: 69% (11 of 16) before hypochlorite treatment and 50% (8 of 16) after hypochlorite treatment (P=0.28). In the peroxide arm of the study, the percentage of rooms with at least one sample positive for *C. difficile* went from 80% (12 of 15) before decontamination with hydrogen peroxide dry-mist to 20% (3 of 15) after decontamination (P=0.003).

Conclusions: The authors concluded that the hydrogen peroxide dry-mist system provides significantly higher efficacy than 0.5% sodium hypochlorite for disinfecting the environment of patients with *C. difficile*, in particular for equipment that is difficult to disinfect manually. They reported that the dry-mist system is easy to use and did not require that the rooms be sealed.

“...the results of our in situ experiments indicate a significantly higher efficacy for the hydrogen peroxide dry-mist system than for the use of 0.5% sodium hypochlorite...”

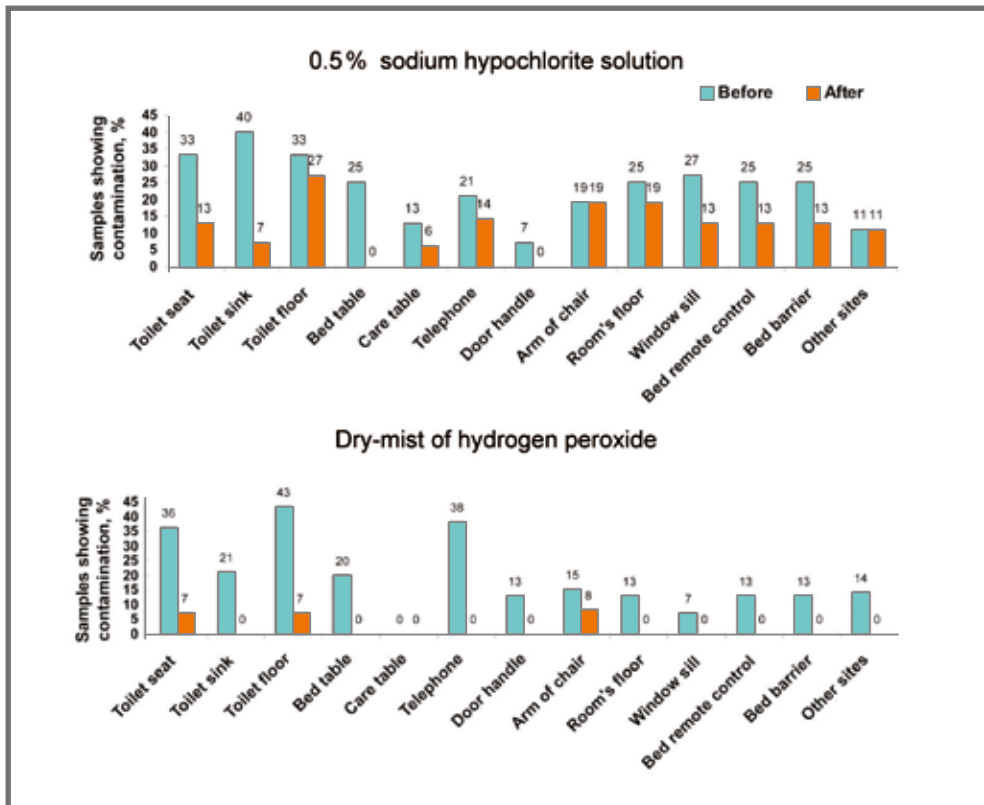


Figure. Percentages of samples from which *C. difficile* was cultured before and after decontamination of the room with either 0.5% sodium hypochlorite solution (upper panel) or a dry-mist of hydrogen peroxide (lower panel), by location of sample.

Source*: Barbut F, Menuet D, Verachten M, Girou E. Comparison of the efficacy of a hydrogen peroxide dry-mist disinfection system and sodium hypochlorite solution for eradication of *Clostridium difficile* spores. *Infect Control Hosp Epidemiol* 2009;30(6):507-14.

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