



# Effectiveness of accelerated hydrogen peroxide cleaning-disinfection wipes and spray in reducing bioburden in the immediate surrounding area of patients in intensive care

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## BACKGROUND

High-touch surfaces are recognized as a possible reservoir of infectious agents and their contamination can pose a risk also for the spread of multi-resistant organisms [1], hence they are recommended to be cleaned and disinfected on a more frequent schedule than minimal touch surfaces [3]. Environmental cleaning and disinfection are important components of a comprehensive strategy in order to control healthcare-associated infections [4–5], especially in wards such as Intensive Care Unit where patients are compromised.

## PURPOSE AND HYPOTHESIS

Evaluate the effectiveness of pre-impregnated wipes with 1% enhanced hydrogen peroxide (Incidin Oxywipe, Ecolab) and a 1.5% hydrogen peroxide boost spray (Incidin Oxyfoam, Ecolab) used on disposable microfibre cloths (CleanOp, Microtek, Ecolab) in the reduction of environmental microbial contamination of high-frequency contact surfaces, used as an alternative to the standard cleaning and disinfection protocol used in an open intensive 12-bed therapy.

## MATERIALS AND METHODS

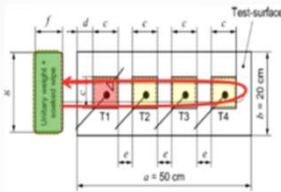
In a 12-bed Intensive Care Unit, six patient units in opposite side of the ICU open-space, functionally separated and with different nursing staff, were daily cleaned and disinfected with different protocols. In two units, the cleaning service staff continued to perform Standard Protocol on furniture surfaces except for electromedical devices when in use, using in sequence an alcohol-based detergent and a chloride-oxidizing agent. In other two units, auxiliary nurses used disposable 1% AHP impregnated wipes (Incidin Oxywipe, Ecolab) on each selected surfaces including electromedical devices, and in the last two they used Incidin Oxyfoam spray and disposable cloths. According to manufacturer's instructions, a "one wipe, one surface, one direction" approach was adopted. Effectiveness in reducing microbial burden was assessed by a contact plate method (UNI EN ISO 14698-1) on 5 high-frequency contact surfaces of occupied beds (bed sides, clinical documentation table, infusion pumps, touch screen monitor, workbench) immediately pre- and post-procedures (600 sampling sites). Total viable count (TVC) was evaluated according to Italian hygiene standard (<50 CFU/24cm<sup>2</sup>).

## RESULTS

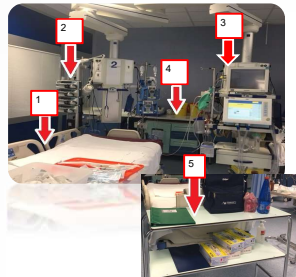
On the 3 non-electromedical surfaces, pre-impregnated wipes demonstrated a decrease in mean TVC from 35 to 6 CFU/24 cm<sup>2</sup> (82.9%), while impregnated cloths from 36 to 9 CFU/24 cm<sup>2</sup> (75.0%), versus a reduction from 39 to 18 CFU/24 cm<sup>2</sup> (53.8%) for the SP (t-test, p <0.05). According to the Italian hygiene standard (ISPESL, 2009), when using pre-impregnated wipes 1 of 100 sites (documentation table) showed TBC >50 CFU/24 cm<sup>2</sup> (Hygiene Failures), 5 of 100 (3 on workbench, 1 bed sides, 1 monitor) using impregnated cloths, whereas for the Standard Protocol 11 of 100 sites (4 on monitor, 3 on workbench, 3 on documentation table, 1 bed sides) were classed as failed (t-test, p <0.05).

### Bactericidal activity of Incidin Oxyfoam-Cleanop Microtek (ISO 16615: 2015)

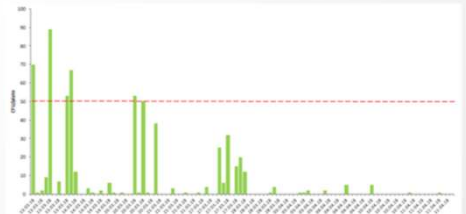
- Bactericidal activity:** Evaluate a decimal reduction of 5 log in T1
- Spreading in other areas:** Evaluate the presence of <50 CFU/25cm<sup>2</sup> in areas T2, T3, T4



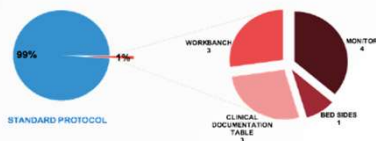
- Bactericidal activity:** *S. aureus* ATCC6538 R<sub>T1</sub> = 6
- Spreading in other areas:** T2: 1 CFU/25cm<sup>2</sup>; T3: 0 CFU/25cm<sup>2</sup>; T4: 0 CFU/25cm<sup>2</sup>



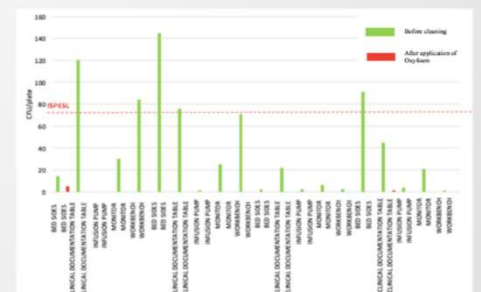
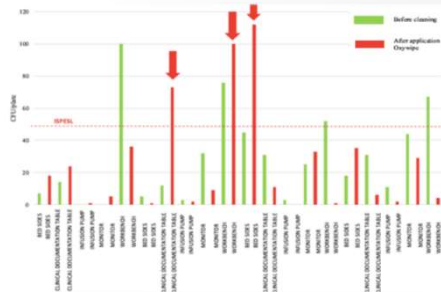
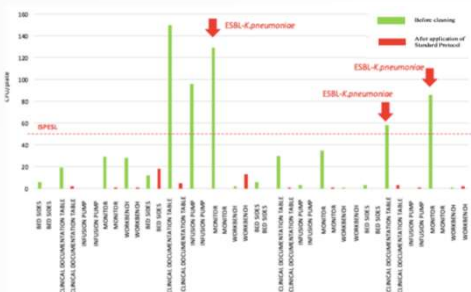
### Microbial burden on hospital surfaces after the application of Incidin Oxyfoam-Cleanop Microtek



### Sampling sites where non-conformities were detected after the application of the three sanitisation protocols



### Microbial burden and alert microorganisms detected before and after the application of sanitisation protocols



## CONCLUSIONS

Disposable wipes (pre-impregnated or impregnating at the time of use) provide a more effective and easier to use alternative to the usual two-step procedures.

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