

EFFECTIVE REDUCTION OF BACTERIA FROM THE WASTE WATER

Dolphin Care UVC Water Trap Disinfectors

Facts

Each time a medical provider wash the hands, a fresh spray of germs may enter the air and infect the hands of the medical provider, who later transfer the germs to the patients.

The problem is well known and described in the scientific literature.

Examples:

- Contaminated Handwashing Sinks as the Source of a Clonal Outbreak of KPC-2-Producing *Klebsiella oxytoca* on a Hematology Ward
- Sources of sporadic *Pseudomonas aeruginosa* colonizations/infections in surgical ICUs: Association with contaminated sink trap
- Wastewater drainage system as an occult reservoir in a protracted clonal outbreak due to metallo- β -lactamase-producing *Klebsiella oxytoca*

Find more examples and links to the peer-reviewed articles at: <https://dolphincare.net/products/water-trap-disinfector/>

UVC disinfection of waste water reduces the number of CFU

There has so far not been any solution to eliminate the appearance of CFUs in waste-water. This have resulted in various out-breaks of Hospital Acquired Infections all over the world.

The Dolphin Care UVC Water Trap Disinfector uses UVC-light in combination with a nano-coating of the pipe and the result is significant reduction of the CFU – 3-6 log₁₀* - in the wastewater.

Using Dolphin Care UVC Water Trap Disinfector may prevent spread of carbapenase producing organism.

* **Source:** Test report issued by MD Leif Percival Andersen, Specialist in Clinical Microbiology and Head of the Laboratory of Hygiene, Rigshospitalet, Copenhagen



Benefits of the Dolphin Care UVC Water Trap Disinfecter

- No other solution to the challenge in the market
- Tested in clinical environment at Rigshospitalet, Copenhagen University Hospital
- A costeffective solution to reduce biofilm of contaminated by bacteria
- Easy to install – fittings to all standards



Recommendations

The following hospitalized immunosuppressed patients may be at a high risk for bacterial infection spread from biofilms in water traps:

- Department for burned patients
- Department for neonates
- Intensive care units - patients treated with artificial ventilation
- Department for neutropenic patients

Decontamination of water traps with ultraviolet-C light

 Katrine Hartung Hansen¹, Marlene Høg¹, Michael Tvede¹, Leif Percival Andersen¹
¹ Department of Clinical Microbiology, Copenhagen University Hospital, Rigshospitalet, Denmark

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Background

Water traps are some of the most contaminated areas in hospitals and increasingly recognized as potential vehicles for transmission of multidrug-resistant bacteria to patients. The aim of this study was to evaluate the efficacy of ultraviolet-C (UV-C) light to decontaminate water traps.

Materials/Methods

A newly developed UV-C decontamination device (patent pending) developed by Danish company Dolphin Care Aps for washbasin water traps (Figure 1) was mounted on four separate washbasins (HygLab, 211, 103A and 200B).

Experimental design:

In two washbasins UV-C light was active while two washbasins were used as controls without UV-C exposure (part 1). After eight weeks, the experiment was swapped and the initial UV-C active washbasins were used as controls and the initial control washbasins were exposed to UV-C light (part 2), see Table 1.

Table 1. Experimental design.

	Part 1	Part 2
Day	0 - 58	59 - 95
UV-C Active	HygLab, 211	103A, 200B
Control	103A, 200B	HygLab, 211

Collection and identification of samples:

- Swabs were taken weekly from the top and the bottom of the washbasin tailpipes and grown on blood agar and lactose agar plates. Bacteria were quantified semi-quantitatively.
- Water was collected from the water traps weekly and serial 10-fold dilutions were made in order to determine total bacterial counts (CFU/mL).
- Bacterial colonies were identified by MALDI-TOF MS technique.

Results

Bacterial counts (CFU/mL):

- A marked reduction in bacterial counts was observed within the first week in the UV-C active water traps compared with the control washbasins in both part 1 and 2 of the experiment. Bacterial counts were reduced by a factor $10^5 - 10^6$ in the UV-C active water traps in part 2 of the experiment (Figure 2).
- Overall a marked difference in bacterial counts was observed between water traps exposed to UV-C light and control water traps throughout the experimental period.
- Within the first two weeks of part 2 of the experiment the bacterial counts in the new control water traps markedly increased to a level similar to the control water traps in part 1 of the experiment (Figure 2).

Species identified:

- UV-C decontamination reduced the total number of different bacteria identified in water traps exposed to UV-C light (UV-C active=5; controls=9).
- After exposure to UV-C light was interrupted the total number of species identified increased.
- Under UV-C light exposure *Pseudomonas aeruginosa* and Gram negative intestinal commensals disappeared while *Stenotrophomonas maltophilia* was markedly reduced.

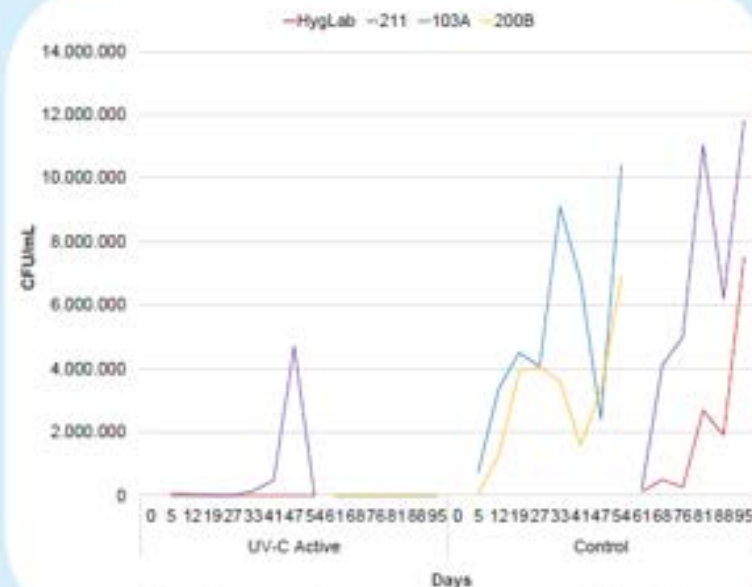


Figure 2. Development of bacterial counts in washbasins exposed to UV-C light (UV-C active) and control washbasins (Control) in part 1 and 2 of the experiment.



Figure 1. UV-C decontamination device for washbasin water traps.

Conclusion

UV-C decontamination of water traps reduces bacterial counts effectively within the first week of use. However, they are quickly contaminated after discontinued UV-C exposure.

UV-C decontamination of water traps may be a feasible adjunctive for prevention of spread of multi-resistant water bacteria from washbasins to immunocompromised patients.

Contact

 Katrine Hartung Hansen, MD, PhD
Katrine.Hartung.Hansen@regionh.dk

 Dolphin Care
www.dolphincare.net



MAINTENANCE, WARRANTY AND SERVICE PACK

We recommend that you add a spoonful citric acid to the drain once a month. This will keep the nano-coating of the lamp free of limescale.

The Water Trap Disinfector comes with a three-years-guarantee from delivery date.

To secure the high level of efficacy the UVC-lamp must be changed once a year.

In order to keep the documented efficacy of the Water Trap Disinfector it is essential that the UV-lamp is replaced with similar lamp.

Dolphin Care and their local distributor offer service agreements which secures that the is changed in due time – a guarantee for a consistent efficacy.

Contact information

Head-office

Dolphin Care ApS
11, Unionsvej
DK-4600 Koege

Tel: +45 7174 1379

Mail: info@dolphincare.net

WWW: dolphincare.net

Local representative

TBN

Tel: +

Mail:

WWW:



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