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VIRUCIDAL EFFICACY OF AN OZONE-GENERATING SYSTEM FOR AUTOMATED ROOM DISINFECTION

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INTRODUCTION

Besides conventional prevention measures, no-touch technologies based on gaseous systems have been introduced in hospital hygiene for automated room disinfection of the surfaces [1]. The whole-room disinfectant device Sterisafe Pro, which creates ozone as a biocidal agent, was tested for its virucidal efficacy.

METHODES

The virucidal activity tests were carried out based on Association Francaise de Normalisation Standard NF T 72-281:2014 [2] which is now published also as EN 17272 [3] in a test room shown in figure 1. The non-enveloped test viruses were murine Norovirus (MNV), simian virus (SV) 40, and human Adenovirus type 5. The enveloped test virus was modified Vaccinia virus strain Ankara (MVA). The activity criterion of the testing according to the standards mentioned is a $\log_{10}$ reduction of at least 4.0.

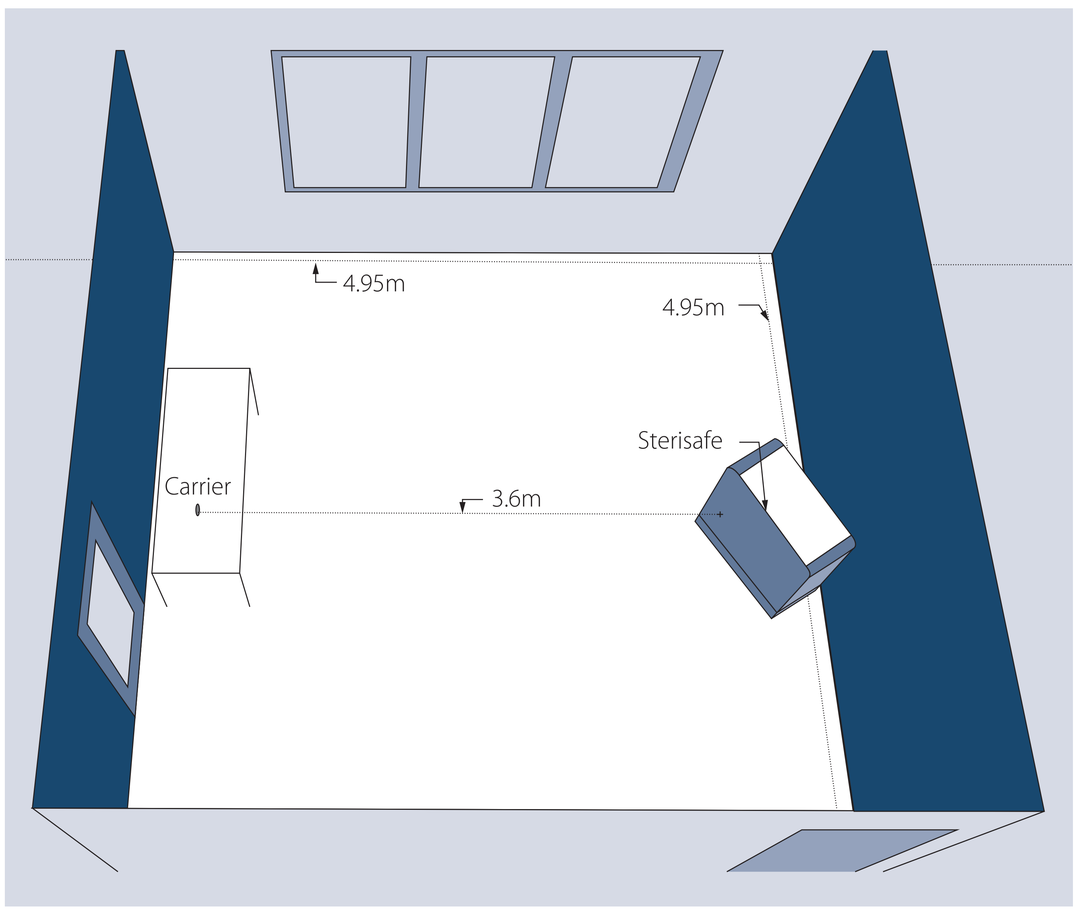

Figure 1: Layout of the room used for testing the air disinfection device. Carriers were placed on a table 3.6 m away from the outlet of the STERISAFE Pro device, as shown

CONCLUSION

These results will help to establish realistic conditions for virus inactivation, and assessment of the efficacy of ozone technology against non-enveloped and enveloped viruses. They can show new options for infection control measurements.

RESULTS

The test results are shown in figure 2. All test virus titres were reduced after 150 and 300 min of decontamination time, with mean reduction factors ranging from 2.63 (murine norovirus) to 3.94 (simian virus 40) [4].

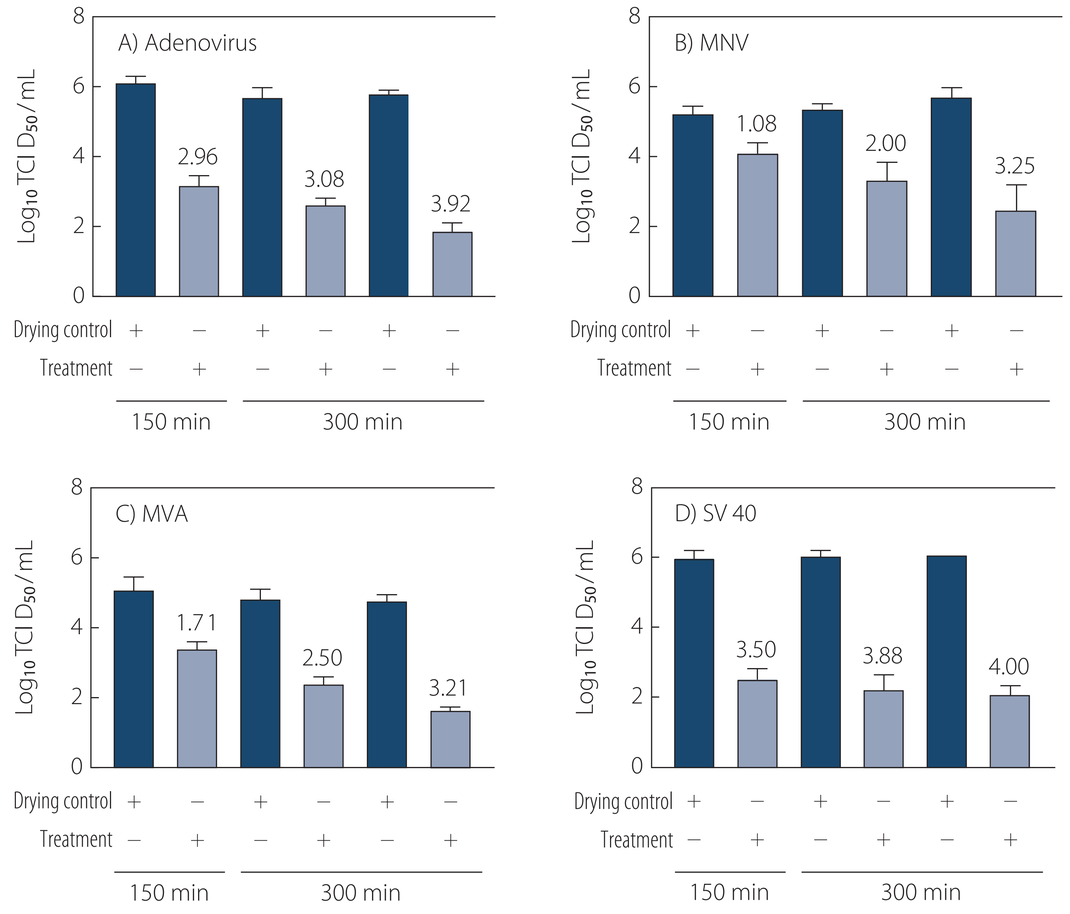

Figure 2: Titre reduction of four test viruses after exposure to ozone (two exposure times). **A)** Human adenovirus type 5. **B)** Murine norovirus. **C)** Modified vaccinia virus Ankara. **D)** Simian virus 40. Respective virus titres with and without treatment are shown. Calculated reduction factors are displayed on top of the grey bars. $TCID_{50}$, tissue culture infectious dose 50 %.

REFERENCES

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2) NF T72-281:2014-11-08: Methods of airborne disinfection of surfaces – Determination of bactericidal, fongicidal, yeasticidal, mycobactericidal, tuberculicidal sporicidal and virucidal activity, including bacteriophages

3) DIN EN 17272:2020-06: Chemical disinfectants and antiseptics – Methods of airborne room disinfection by automated process – Determination of bactericidal, mycobactericidal, sporicidal, fungicidal, yeasticidal, virucidal and phagocidal activities

4) J Steinmann, T Burkard, B Becker, D Paulmann, D Todt, B Bischoff, E Steinman, F H H Brill. Virucidal efficacy of an ozone-generating system for automated room disinfection, J Hosp Infect 2021;116:16-20. doi: 10.1016/j.jhin.2021.06.004.