Edition 1 • January 2018

endoNEWS INTERNATIONAL

Dear readers,

In recent years, flexible endoscopy has developed from a diagnostic method to a highly specialized therapy system. Today, constantly developing technologies enable therapeutic treatments that were formerly dependent on surgery – with the help of flexible endoscopes. This remarkable development also requires the highest standards when it comes to safety and the reprocessing of endoscopes.

Without a doubt, in the field of disinfection peracetic acid is currently the substance with the highest potential for inactivating microbes. Anyway, it is often viewed as a miracle cure in disinfection practice – without considering technical requirements concerning agent concentration, temperature and contact times.

A study recently published in the journal Antimicrobial Resistance & Infection Control on the proof of virucidal efficacy of peracetic acid in the automatic reprocessing of endoscopes points out the limitations of effectiveness of the substance, if the agent concentration is too low. Read more about the matter in the publication at hand!

Have an insightful read.

With kind regards

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DR. WEIGERT
Systematic Hygiene

VIRUCIDAL EFFICACY OF PERACETIC ACID FOR INSTRUMENT DISINFECTION

Based on the publication by Becker et al. Antimicrobial Resistance & Infection Control 2017; 6: 114

Thermolabile instruments that cannot be disinfected at higher temperatures, such as flexible endoscopes, are typically processed by automated chemo-thermal instrument disinfection using disinfectants containing e. g. peracetic acid (PAA) or glutaraldehyde as active substance. PAA can be used at temperatures ‹ 40 °C, reducing temperature stress for instruments as an advantage. Moreover, PAA has a broad virucidal efficacy and requires short exposure times. Aldehydes are active substances of disinfectants with a comparative spectrum of activity and therefore represent a possible alternative to PAA. The use of aldehydes for instrument disinfection, however, often requires higher temperatures of 50–60 °C as well as longer processing times.
Due to its advantageous characteristics PAA is used as an active ingredient in various formulations of instrument disinfectants for reprocessing flexible endoscopes. Products for automated reprocessing contain different PAA concentrations ranging from 400 to 1500 parts per million (ppm) and are used at temperatures ranging from 20 °C to 37 °C. Since valid information on PAA's virucidal activity at different concentrations and temperatures is limited, Becker et al. evaluated the efficacy of different PAA solutions on test viruses using the quantitative suspension test according to EN 14476. Additionally they performed tests based on the recently established European pre-norm prEN 17111:2017, applying a carrier assay to simulate practical conditions using frosted glass.

Methods

For the examination of virucidal efficacy the authors tested solutions with different PAA concentrations (400, 600, 800, 1000, 1200 and 1500 ppm). The following tests were applied:

- Quantitative suspension test according to the European Standard EN 14476 with poliovirus (PV), adenovirus (AdV), and murine norovirus (MNV) as surrogate of human norovirus
- Quantitative carrier assay using frosted glass based on prEN 17111:2017 with AdV, MNV, and PV

For all tests, clean conditions (0.3 g/L bovine serum albumin) and a fixed exposure time of five minutes were used. Test temperatures were 20 °C, 25 °C, and 35 °C. To demonstrate sufficient efficacy, a 4 $\log_{10}$ reduction in virus titer must be achieved.

Results

The results of the quantitative suspension test are shown in fig. 1. Table 1 additionally summarizes the specific conditions that led to a 4 $\log_{10}$ titer reduction of the viruses tested.

Table 1: Results from suspension test (EN 14476) using PAA-based products

Test virus	4 $\log_{10}$ reduction at
PV	1500 ppm, 35 °C
AdV	400 ppm, 20 °C
MNV	400 ppm, 20 °C

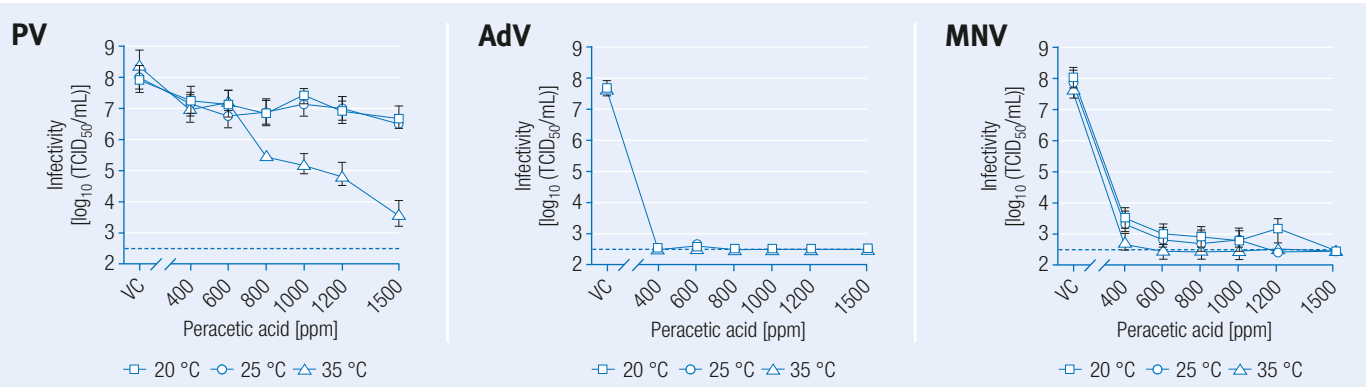

Fig. 1: Inactivation of PV, AdV, and MNV with different PAA concentrations at 20 °C, 25 °C, and 35 °C in the quantitative suspension test depicted as $\log_{10}$ $TCID_{50}$/mL; exposure time was five minutes; dotted line: detection limit of assay

In the carrier assay 400 ppm PAA at 20 °C were sufficient for AdV inactivation, whereas for MNV 600 ppm PAA were required at 25 °C as well as 35 °C and 1000 ppm at 20 °C. A PAA solution with 1000 ppm at 35 °C was required for complete inactivation of PV. However, as a result of a dramatic decrease of titer (below 4 $\log_{10}$) after drying and additional incubation of the carrier prior to PAA-use, a 4 $\log_{10}$ reduction of PV titer could not be achieved in the carrier test. Therefore, PV could not serve as a test virus in the prEN 17111-based examination.

Conclusion

The results of the quantitative suspension test show that at a given exposure time of 5 minutes 1500 ppm PAA at a temperature of 35 °C were necessary for a sufficient virucidal activity. However, after passing the requirements of the suspension test products should also pass the carrier test, (when prEN 17111 is finally adopted) to prove full efficacy. Because of the high stability of PV in the suspension test, additional examinations with AdV and MNV on glass carriers are only of limited importance. PV could not serve as test virus in this study's carrier assay due to methodological reasons. **On the basis of the present data it is recommendable that utilized products are checked for efficacy tests according to EN 14476.** neodisher endo® SEPT PAC has been tested according to EN 14476 and showed adequate efficacy to be used for instrument disinfection under the condition of fully virucidal effectiveness.

neodisher endo® SEPT PAC

The disinfectant based on peracetic acid stands out due to its rapid efficacy and extensive activity spectrum.

- For the automated disinfection of flexible endoscopes in washer-disinfectors (WD-E).

Effective Disinfection:

neodisher endo® SEPT PAC is active against bacteria (incl. MRSA, tuberculosis pathogens, Helicobacter pylori), fungi, mycobacteria, spores (incl. C. difficile) and viruses (incl. hepatitis A, B and C, HIV, rotaviruses, noroviruses). The disinfecting activity has been tested and confirmed according to the DIN EN 14885. **neodisher endo® SEPT PAC** complies with the requirements on disinfectants for the disinfection of flexible endoscopes according to the DIN EN ISO 15883-4. The automated reprocessing process with **neodisher endo® CLEAN** and **neodisher endo® SEPT PAC** fulfils the requirements of the DIN EN ISO 15883-4 regarding a germ reduction of ›9 $\log_{10}$ in the entire process.

Application Recommendation:

automated disinfection of flexible endoscopes	10 ml/l (1.0 %), 25 °C, 10 min or 10 ml/l (1.0 %), 35 °C, 5 min

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Please contact us if you have any questions or suggestions that you are interested to read about – we will gladly take your ideas into consideration!

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