Disinfectants Commission in the Association for Applied Hygiene (VAH) in collaboration with the „4+4 Working Group“

Verbund für Angewandte Hygiene e.V
Desinfektionsmittel-Kommission

Recommendation on the monitoring of critical control points for the use of dispensing systems for pre-moistened surface disinfectant wipes[1]

1 Background

The basis for this recommendation by the VAH Disinfectants Commission is the recommendation „Hygiene Requirements on Surface Cleaning and Disinfection“ which was published by the Commission for Hospital Hygiene (KRINKO) of the German Federal Robert Koch Institute (RKI) in 2004 (1). Amongst other things, this recommendation lists as a requirement: “Ready-to-use solutions of disinfectants must be used for one working day at most (Cat. IB).“

At the time when the KRINKO recommendation was published, the special implications of dispensing systems for pre-moistened surface disinfectant wipes were not taken into account because wipes had not been used on a broader basis. Meanwhile, however, wipes are being used widely with good compliance especially for the near-patient environment. Contrary to the requirement mentioned above, stating that ready-to-use solutions may be used for just one working day at most, instructions provided by the manufacturers recommend application of wipes wetted with VAH-listed disinfectants from dispensers for a period of up to 28 days.

The preface for the chapter on surface disinfection in the VAH List of Disinfectants says “If not available as such (*i.e. pre-prepared wipes*), the working solutions should as a rule be freshly prepared; this always applies for disinfectants based on peroxide compounds and on chlorine releasing compounds” (2). It continues “Any working solutions left over must not be allowed to stand for a long time (at most one working day, observe instructions provided by the manufacturer).”

Hence, pre-moistened surface disinfectant wipes from bucket dispensers have not yet been included in the pertinent lists of disinfectants tested and deemed to be effective because validated test procedures for this mode of application are still lacking.

---

[1] English translation of the German original publication „Empfehlung zur Kontrolle kritischer Punkte bei der Anwendung von Tuchspendersystemen im Vortränksystem für die Flächendesinfektion“. HygMed. 2012;37(11):468-469.

The effectiveness of pre-moistened wipes in these bucket dispensers and the use specifications listed by VAH refer only to tests of the solutions but not to the efficacy of surface disinfection procedures applying pre-moistened wipes with a reuse period of up to 28 days.

Thus, current dispenser systems for pre-moistened surface disinfectant wipes are a recent development which have neither been reflected in the KRINKO recommendations for cleaning and disinfection of surfaces nor in the test methods of VAH for assessing disinfectant efficacy, in particular with respect to longer reuse periods. So far information concerning their effectiveness solely refers to data provided by the manufacturers.

Since meanwhile pre-moistened surface disinfectant wipes from bucket dispensers are being used widely, the VAH Disinfectants Commission deems it necessary to provide guidance for the selection and use of these dispenser systems. The VAH Disinfectants Commission currently concerns itself with methods for testing dispensing systems for pre-moistened wipes with long reuse periods.

In the past, insufficient use concentrations for surface disinfection and cleaning have led to infections and outbreaks of nosocomial infections time and again. As of now, however, epidemiological evidence concerning the causal implications of dispensing systems for pre-moistened wipes has not been reported neither for sporadic nosocomial infections nor for outbreaks of nosocomial infections.

However, it cannot be excluded that dispensing systems for pre-moistened wipes have not been systematically examined and/or taken into consideration as an infection reservoir for nosocomial outbreaks.

There are, however, sporadic reports of contaminated bucket dispensers in real-life use, prompting the VAH Disinfectants Commission to perform a hazard analysis and publish critical control points.

2 Critical control points for the use of pre-moistened disinfectant wipes from dispensing systems

According to the HACCP concept, critical control points include:

2.1 Use of disinfectant solutions already contaminated at the time of (re)filling the bucket dispensers

Contamination of disinfectant solutions to be filled in the containers (buckets) of dispensers for pre-wetting the wipes – which may occur e.g. if dosing units or potable water taps used to prepare the disinfection solution are contaminated with biofilms – may result in contamination of the wipes pre-moistened with this disinfectant.

Contamination with biofilm flakes is associated with the risk of pathogen persistence and subsequent tolerance against the specific disinfection procedure being used. For this reason, as specified by KRINKO, contamination of the disinfectant solution must be minimised during use. Therefore, prevention of biofilm formation, e.g. in dosing units or in taps which are used when adding potable water for mixing use solutions of disinfectants, is of utmost importance.

According to the KRINKO recommendation on surface cleaning and disinfection "Bacterial strains with reduced susceptibility or development of tolerance, can, in principle, be selected in particular conditions (e.g. biofilm) even if the disinfectants are dosed correctly."

2.2 Use of wipes not compatible with the disinfectant

More recent investigations have shown that certain wipe fabrics inactivate or reduce the effectiveness of disinfectants, especially those based on quaternary ammonium compounds. This may result in a significant loss in efficacy of the disinfectant, in particular with longer reuse periods. Therefore, compatibility of the wipe dispensing system with the disinfectant is of great importance.

2.3 Loss of effectiveness after long periods of reuse

According to the KRINKO recommendation on surface cleaning and disinfection "Insufficiently concentrated or ineffective disinfectant solutions, especially when prepared and stored in contaminated receptacles for a long period of time, can become a source of infection, above all containing gram-negative bacteria (above all Enterobacteriaceae, pseudomonads)."

Therefore, a test in order to exclude a loss of effectiveness of the disinfectant after a reuse period of up to 28 days is of utmost importance.

2.4 Loss of effectiveness due to dried out wipes

In everyday use, wipes have been observed to dry out and lose their effectiveness when hanging out from a bucket when the lid is not closed. Therefore, drying out of wipes, e.g. due to incorrect sealing of the lid, must be avoided.

2.5 Contamination of wipes hanging out of the buckets

In everyday use, it has not only been shown that wipes will dry out if the lid is not closed but also that there is a risk of contamination, e.g. by contact with contaminated gloves, in moist areas in particular with gram-negative bacteria.

2.6 Multiplication of gram-negative bacteria in containers

During an outbreak with *Klebsiella oxytoca*, the pathogen was isolated from disinfectant buckets, exhibiting an increased tolerance to the disinfectant (2, 3).

According to the KRINKO recommendation "Buckets and other receptacles must be cleaned thoroughly after cleaning/disinfecting activities have been concluded (Cat. IB)."

The VAH Disinfectants Commission considers it to be prudent that containers are subjected to a disinfectant cleaning procedure after use and/or – in the event of

incomplete drying – immediately prior to reuse.

3 Monitoring

The VAH Disinfectants Commission considers the following quality monitoring procedures to be important and recommends their rigorous implementation:

3.1 Rapid detection of the contamination of the disinfectant used for filling the container

The contents of the dispensing system for pre-moistened wipes (solution and, if necessary, wipes) should be examined for contamination in the context of random inspections.

3.2 Expert evaluation of the compatibility of the wipe dispenser and the disinfectant

When selecting wipes, the manufacturer of the disinfectant and/or the wipes has to provide proof that the wipe fabric does not compromise the disinfectant effectiveness during the recommended period of reuse by expert evaluation. The corresponding expert report has to be presented when selecting wipe dispensing systems.

3.3 Proof for extended periods of reuse

The manufacturer of disinfectants to be used with dispensing systems for pre-moistened surface disinfectant wipes has to present proof by expert evaluation that there will not be a loss of effectiveness during the reuse period specified by the manufacturer. The employed methods for efficacy testing must simulate practice conditions. Alternatively, analytical methods may be used to document that the quantity of active ingredient released from the wipes is sufficient and that other parameters essential for effectiveness (such as pH-value) are not altered by the wipe fabric.

3.4 Requirements on the design of the container

The containers for wipe dispensing systems must be designed in such a way that they are easy to close even when wipes are hanging out of the container in order to avoid both drying out and contamination of the wipes.

On the other hand, lids must be easy to open so that the wipes can be pulled out without any difficulty.

3.5 Safe sealing of the lid while the dispenser is not in use

A work instruction is to ensure secure sealing of the lid while the dispenser is not in use.

3.6 Processing of the buckets prior to refilling

In order to prevent selection of microorganisms which are resistant to disinfectants, containers should always be subjected to a thorough disinfectant cleaning procedure after use of the last wipe and subsequently dried before refilling them with wipes and disinfectant solution. Chemo-thermal processing may be applicable.

The manufacturers of the pertinent containers are asked to offer containers which may be processed in automatic washer disinfectors.

3.7 Investigations in the event of noscomial outbreaks

In the event of nosocomial outbreaks, in particular with gram negative bacteria, wipe dispensing systems must be examined hygienically and microbiologically as a potential reservoir for infection.

References

1. Kommission für Krankenhaushygiene und Infektionsprävention am Robert Koch-Institut (KRINKO). Anforderungen an die Hygiene bei der Reinigung und Desinfektion von Flächen. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz*. 2004;**47**:51-61.
This Guideline was translated into English on behalf and responsibility of the German Society of Hospital Hygiene: http://www.dgkh.de/Nutzerdaten/File/empfehlungen/2010_rki_cleaning.pdf.

2. Gebel J, Sonntag HG, Werner HP, Vacata V, Exner M, Kistemann T. The higher disinfectant resistance of nosocomial isolates of Klebsiella oxytoca. How reliable are indicator organisms in disinfectant testing? J Hosp Infect 2002;50(4)309–311.

3. Reiss I, Borkhard A, Fussle R, Sziegoleit A, Gortner L. Disinfectant contaminated with Klebsiella oxytoca as a source of sepsis in babies. Lancet 2000;356(9226):319.

For further information, please contact:

VAH e.V.

Desinfektionsmittel-Kommission

c/o Institut für Hygiene und Öffentliche Gesundheit der Universität Bonn

Sigmund-Freud-Str. 25

53127 Bonn

Germany

Tel: +49 228 287-14022

Fax: +49 228 287-19522

email: info@vah-online.de

www.vah-online.de

Chairman: Prof. Dr. med. M. Exner

Secretary: Dr. J. Gebel