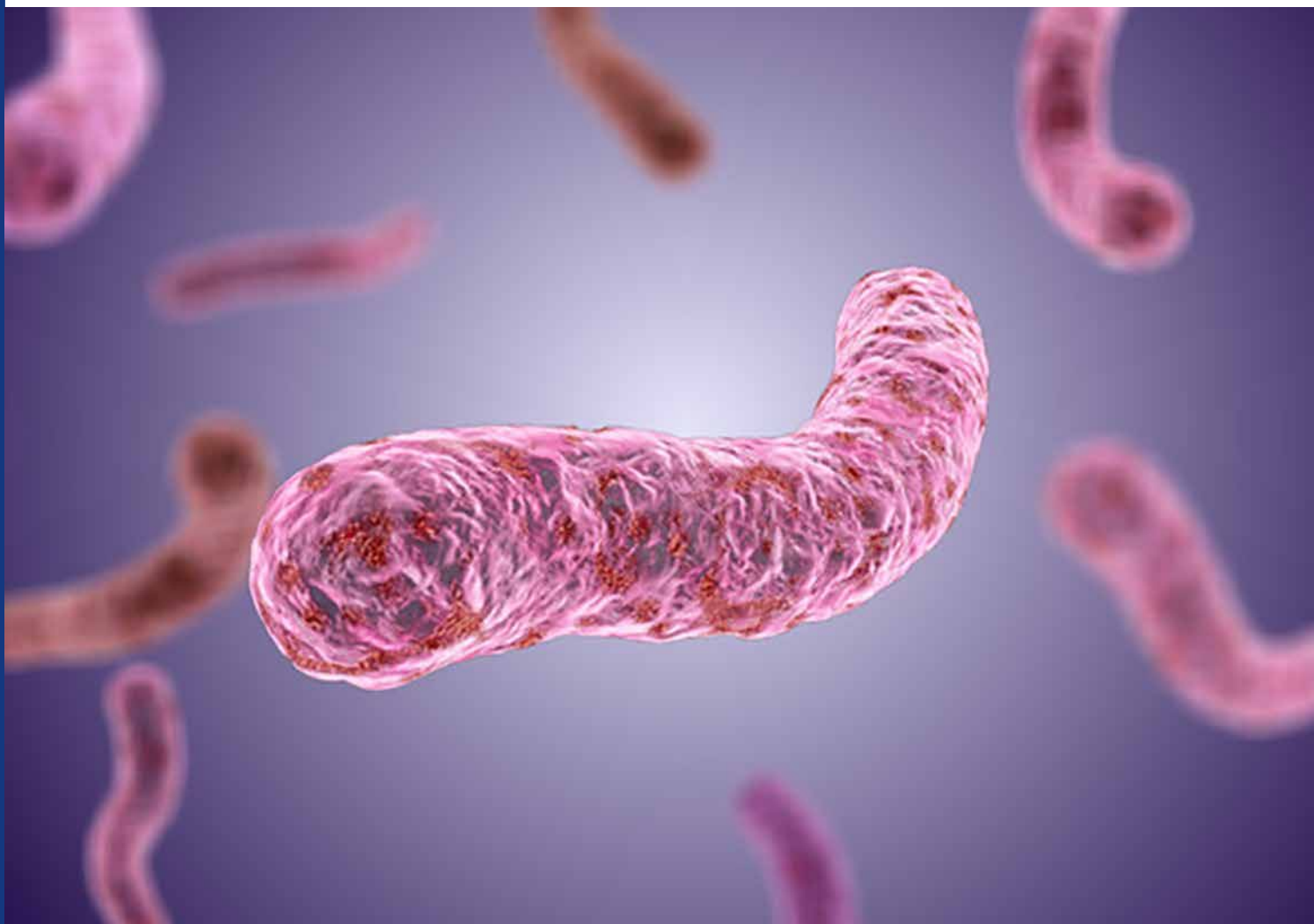


Are alcohol wipes effective in the presence of protein?

Dr Tim Sandle reports on a new study that examines the microcidal efficacy of alcohol based wipes on a variety of protein contaminated dental surfaces.



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Infection control is an integral part of dental practice, particularly in ensuring that surfaces are clean and potentially pathogenic microorganisms, including the bacteria that cause tuberculosis and MRSA infections are eliminated.

HTM 01-05 6.61 recommends that: "The patient treatment area should be cleaned after every session using disposable cloths or clean microfibre materials – even if the area appears uncontaminated."

Surfaces should be wiped down

between patients with a high quality disinfectant. Wipes pre-saturated with the disinfectant of choice are usually the preferred format in a busy dental practice as they are convenient to use, disposable and require less storage space than sprays. An ideal disinfectant should have a high inactivating capacity for a wide range of viruses, including HIV and hepatitis, as well as being effective against bacteria, including tuberculosis. It should be safe to use and suitable for frequent application. ➔

Research suggests that alcohol wipes are capable of destroying the widest range of microbial contamination (including *Mycobacteria*, the genus of bacteria that includes the infectious cause of tuberculosis). Alcohol wipes are virucidal against 'enveloped' viruses, such as HIV and hepatitis B and against the 'non-enveloped' viruses, such as poliovirus, rhinoviruses and hepatitis A.

However, in addition to microbial contamination, surfaces may also be contaminated with protein residues such as blood and pus. It has been suggested that alcohol may bind protein to stainless surfaces and the presence of protein may compromise the efficacy of alcohol based wipes. To test the protein binding hypothesis, a study was performed in conditions to simulate those found in a dental practice. Alcohol wipes were tested on three surfaces including stainless steel against the microorganisms commonly found in dental surgeries, in the presence of protein residues.

This article examines the design and results of the study; and assesses the implications for practices when selecting a disinfectant wipe.

Study design

The selection of microorganisms and surfaces was designed to simulate the types of pathogens, protein residues and conditions that are likely to be found in a typical dental practice. The test method was based on an internationally recognised standard for the evaluation of disinfectant wipes on hard surfaces.

Mikrozyd alcohol based wipes were tested for their ability to destroy or remove a range of microorganisms from three different surfaces - formica, stainless steel and laminate. The microorganisms assessed were: *Staphylococcus aureus* (which is linked to MRSA infection), a *Mycobacterium* with similar properties to tuberculosis, a microorganism commonly associated with water system contamination, and the yeast that causes thrush. The population of each microorganism used was sufficient to measure that up to 1000-times kill of the microorganism had been achieved. The microorganisms were sourced from an approved culture collection.

To simulate the effect of potential protein fixation, a pure protein was used (albumin), with each surface containing three percent protein contamination. The test panel of microorganisms was inoculated onto samples of the three different surfaces, in a laboratory and allowed to dry.

The surfaces were then double-wiped with the alcohol based wipes. Each surface was left for one minute to allow the disinfectant to penetrate the microorganisms. The action of the alcohol based wipe was then measured.

To ensure the robustness of the study, 10 carriers were used for each test. Each microorganism was tested on three occasions to demonstrate that the test was reproducible.

Study results

The results of the study demonstrated that alcohol based wipes achieved a three-log reduction in the microbial challenge, in the presence of pure protein residue. No protein fixation was observed at any stage of the study.

A summary of the test outcomes for the alcohol wipes is shown in table 1.

Conclusion

The study demonstrated that Mikrozyd alcohol based wipes are effective in eliminating a range of different microorganisms from surfaces, in the presence of protein residue. In practice,



the correct use of the wipes should be followed using a double wiping technique and the disinfectant should remain in contact with all surfaces for one minute.

Dental practices can therefore use alcohol-based wipes with confidence for hard surface cleaning when the most effective spectrum of disinfectant activity is required, including all hard surfaces contaminated with protein residues.

References available on request.

Microorganism	Surface	Dirty conditions – protein residue
Mycobacterium terrae (ATCC 35741)	Formica	Pass
	Stainless steel	Pass
	Laminate	Pass
Candida albicans (ATCC 10231)	Formica	Pass
	Stainless steel	Pass
	Laminate	Pass
Pseudomonas aeruginosa (ATCC 9027)	Formica	Pass
	Stainless steel	Pass
	Laminate	Pass
Staphylococcus aureus (ATCC 6538)	Formica	Pass
	Stainless steel	Pass
	Laminate	Pass

Table 1: Table showing the outcomes from the test on the Mikrozyd alcohol wipes using four microorganisms and three surface types, examined under dirty (protein soiled) conditions. The challenge population was $>1 \times 10^3$ for each microorganism.