Summary of: The cleaning of photographic retractors; a survey, clinical and laboratory study

P. E. Benson,¹ A. Ebhohimen² and I. Douglas³

FULL PAPER DETAILS

¹Reader/Honorary Consultant in Orthodontics, ²PhD Student, Department of Oral Health and Development, ³Director of Research, Department of Oral and Maxillofacial Pathology, School of Clinical Dentistry, University of Sheffield, Clarendon Crescent, Sheffield, S10 2TA

*Correspondence to: Dr Philip Benson
Email: p.benson@sheffield.ac.uk

Online article number E14

Refereed Paper – Accepted 24 November 2009

DOI: 10.1038/sj.bdj.2010.310

©British Dental Journal 2010; 208: E14

VERIFIABLE CPD PAPER

Objectives To determine the methods currently being used to decontaminate photographic retractors in specialist orthodontic practice and to investigate the effectiveness of the cleaning methods. **Design** The study was carried out in two parts: I – a postal self-report questionnaire, and II – a cross-sectional clinical and laboratory investigation. **Setting** The Orthodontic Department of the Charles Clifford Dental Hospital. **Subjects and materials** I – The questionnaire was sent to 278 specialist UK orthodontists. II – One hundred and twenty pairs of photographic retractors were collected following use. One retractor from each pair was randomly chosen to be the unwashed control and immediately placed in 20 ml of PBS-Tween for elution. The other was subjected to the one of four cleaning procedures: alcohol wipe, handwashing, ultrasonic bath or washer-disinfector, before being placed in PBS-Tween. Aliquots were taken for assay. **Main outcome measures** Antibody capture (ELISA) for amylase, to detect the presence of saliva, and for albumin, to detect the presence of serum. **Results** I – The questionnaire response rate was 65% and the majority of respondents (87.2%) were routinely taking clinical photographs. A wide variety of techniques were being used to decontaminate photographic retractors. II – All unwashed controls had detectable levels of amylase and albumin. All the retractors that were cleaned using an alcohol wipe had residual detectable levels of amylase and 80% had detectable levels of albumin. Only one retractor had detectable amylase and one had detectable albumin following cleaning using the washer-disinfector. There was a highly significant statistical difference between the techniques in the proportional reduction in both amylase and albumin detected from the unwashed control and cleaned experimental retractors ($p < 0.001$). The infective risk from inadequate cleaning of photographic retractors is discussed. **Conclusions** The washer-disinfector is the most effective method of cleaning photographic retractors, but no method was found to be 100% successful at removing amylase and albumin.

EDITOR'S SUMMARY

So, here we are again on the continuing and vexatious matter of cross-infection control, this time in relation to another piece of equipment in the form of photographic retractors. Of course there is no doubt that these devices which are placed in the mouth will become contaminated with bodily fluids such as saliva and possibly blood, and as such require adequate decontamination. The question, as is increasingly being raised for all aspects of dental practice, is what constitutes decontamination appropriate to the risk and specifically in terms of economic balance?

This concern is translated into graphic imagery by the statement made in the free comment section of this study's survey in

which the respondent opined that '*Retractors are like cutlery used in restaurants and since these are not sterilised there is no need to sterilise retractors.*' While the logic might not be quite correct the sentiment behind the thought is, I suspect, one with which many readers will have some sympathy. While we all agree that some measure needs to be taken because of theoretical risk, what evidence is there anywhere in the literature, or even anecdotally, of cross-infection stemming from contaminated photographic retractors? On this basis should we also pass the waiting room magazines through washer-disinfectors on the assumption that patients may have licked their fingers in order to help turn the pages? There's no evidence for this, but...

I am taking the analogy too far and thankfully the authors of this paper do provide a solution to the problem. Passing the retractors through a washer-disinfector cycle seems to be the current practical decontamination method of choice although they too point out that this did not remove 100% of their markers of potential cross-infection vectors. Just how far do we go with this?

The full paper can be accessed from the BDJ website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 208 issue 7.

Stephen Hancocks,
Editor-in-Chief

DOI: 10.1038/sj.bdj.2010.341

TO ACCESS THE BDJ WEBSITE TO READ THE FULL PAPER:

- BDA Members should go to www.bda.org.
- Click the 'login' button on the right-hand side and enter your BDA login details.
- Once you have logged in click the 'BDJ' tab to transfer to the BDJ website with full access.

IF YOUR LOGIN DETAILS DO NOT WORK:

- Get a password reminder: go to www.bda.org, click the login button on the right-hand side and then click the forgotten password link.
- Use a recommended browser: we recommend Microsoft Internet Explorer or Mozilla Firefox.
- Ensure that the security settings on your browser are set to recommended levels.

IF YOU HAVE NOT YET SIGNED UP TO USE THE BDA WEBSITE:

- Go to www.bda.org/getstarted for information on how to start using the BDA website.

IN BRIEF

- This research is the first work to examine the effectiveness of various methods of cleaning photographic retractors.
- The technique described is very sensitive and can be applied to a number of different situations.
- It clearly demonstrates that washer-disinfectors are the first method of choice.
- No technique was 100% effective at removing all protein.

COMMENT

The results of this study come at an interesting time for the dental community following the release of 'HTM 01-05: decontamination in primary care dental practices'. Whilst the guidelines are encouraging dentists to use automated methods to wash and clean their medical devices, ie dental instruments, many dentists want to see the evidence on which this guidance is based. This manuscript deals with the cleanability of photographic retractors that are used, when taking a clinical image, to retract cheeks and lips in order to obtain an adequate view of the teeth. Consequently, these retractors will come into contact with saliva and possibly blood. It is widely recognised that bodily fluids and other contamination must be removed from dental instruments, to prevent blood borne pathogens being protected during sterilisation. However, only 85% of those responders to a postal questionnaire disinfected or cleaned the retractors between patients with only 73% claiming to sterilise the retractors following cleaning. A number of responders felt 'that the requirements of cross-infection control were considered to be onerous and unnecessary' and that 'retractors are like cutlery used in restaurants and since these are not sterilized there is no need to sterilise retractors'. Clinically-used photographic retractors were then collected and cleaned using one of four processes including cleaning using alcohol wipes, handwashing, ultrasonic cleaning and using a washer-disinfector.

The authors analysed amylase (as a surrogate marker for saliva contamination) and albumin (as a surrogate of blood) and found that alcohol wipes only removed 73% of the albumin (blood). With the other techniques, >90% of the albumin (blood) was removed but saliva and blood could still be detected on the retractors with the authors indicating that retractors could be a potential vehicle for transmitting viral infections. The most effective method of cleaning the retractors was the washer-disinfectors, however as no method was 100% successful in removing salivary proteins the authors recommended that clear guidelines on cleaning and sterilising these medical devices should be introduced. It is clear from this study that the requirements for cross-infection control would not be onerous if washer-disinfectors were used and that this process would reduced the risks associated with these retractors if used uncleaned and unsterilised.

J. Walker
Principle Investigator,
Decontamination Biosafety Unit,
Research Department,
Health Protection Agency Centre for
Emergency Preparedness and Response,
Porton Down

AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

Clinical photography is both rewarding to the clinician and an effective means of monitoring treatment progress. It is also increasingly being considered an important component of the clinical record. It is therefore essential that photography is undertaken safely and the equipment used is properly cleaned in order to minimise the risk of cross infection. No previous work has reported on the effectiveness of various methods of cleaning photographic retractors. Washer-disinfectors are becoming accepted as the first method of choice for the cleaning of contaminated dental instruments and we were interested in looking at how well they cleaned photographic retractors.

2. What would you like to do next in this area to follow on from this work?

Some of the questionnaire findings were interesting and require further exploration. It should be possible to observe actual practice with regard to cross-infection control in specialist orthodontic practice to determine if the clinician's reported actions were accurate. It would also be helpful to discover, in more detail, what clinicians believed to be the barriers to carrying out effective cross-infection control. With regard to the effectiveness of cleaning procedures we have described a very sensitive technique that could be applied to a number of clinical situations. Further studies are needed to also show the effect these different methods of cleaning would have on viral and bacterial loads obtained from used photographic retractors