# Summary of: Survey of the decontamination and maintenance of dental handpieces in general dental practice

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**FULL PAPER DETAILS**

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**Objectives** To determine how dental handpieces are decontaminated and maintained in general dental practice. **Design** Observational survey. **Setting** The survey was carried out in general dental practice in Scotland. Survey visits ran from January 2003 until the end of March 2004. **Methods** Data were collected by interview and observation in 179 dental surgeries in Scotland. **Results** In virtually all surgeries, handpieces were cleaned before disinfection or autoclaving (99%; n = 177), most commonly by wiping the external surface with a cloth impregnated with disinfectant. Most surgeries lubricated their handpieces after cleaning and before sterilisation (91%; n = 162), although a number of surgeries (24%; n = 42) also lubricated their handpieces after sterilisation. In the majority (97%; n = 174) of dental surgeries, all handpieces were autoclaved after use, most frequently (89%; n = 160) in a bowl and instrument steriliser. In 38 surgeries (21%), handpieces were being wrapped (paper pouches) before sterilisation in bowl and instrument sterilisers. A minority of surgeries (20%; n = 36) had a dedicated handpiece for surgical procedures. **Conclusions** The majority of dental handpieces are manually cleaned externally with a disinfectant impregnated cloth and processed in a type N (bowl and instrument) bench top steam steriliser. Handpieces are lubricated with non-water soluble lubricants at different stages of reprocessing, indicating clarification is required in this area. More work is required by manufacturers to establish a validated cleaning and lubrication process to facilitate the sterilisation of handpieces.

## EDITOR'S SUMMARY

The high profile issue of decontamination of dental instruments has been frequently brought to dentists' attention over the past few years and, quite rightly, we can be sure that this issue is not going to go away. By 2011, all primary care dental services in the UK will be regulated by, and have to register with, the Care Quality Commission, who will ensure that practices conform to the standards of decontamination laid down in the Department of Health's health technical memorandum HTM 01-05.[1] Previous studies published in the *BDJ*[2,3] suggest that for many dental surgeries, complying with the HTM 01-05 standards will mean significant changes to both practice and equipment.

Dental handpieces pose a particular problem for cleaning and sterilisation due to their construction and working parts. This study by Smith *et al.* aimed to discover the methods currently used by dental practices in Scotland to decontaminate dental handpieces, using a previously-described observational method. The results showed both positive and negative findings: the fact that the vast majority of practices now autoclave handpieces after use is, as the authors point out, a positive development. However, the authors also highlight the fact that at present there are no validated cleaning processes for dental handpieces, and that manufacturer supplied lubricants are not water soluble, which can affect steam penetration and therefore impair sterilisation. The most appropriate method for sterilising handpieces is using a vacuum steam steriliser, which are currently not widely used.

As the authors point out, development of a validated cleaning process and appropriate lubricants is the responsibility of handpiece manufacturers. A previous study by Roebuck *et al.* highlighted considerable shortcomings in some manufacturers' decontamination instructions,[4] and the results of this study suggest that this still presents a major obstacle to successful decontamination of handpieces and consequently to compliance with HTM 01-05. It seems that we still have some way to go on handpiece decontamination, and time is increasingly short.

**The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 207 issue 4.**

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**IN BRIEF**

- Uses robust methodology to provide a useful insight into dental handpiece decontamination.
- Demonstrates that 97% of dental surgeries studied autoclaved their handpieces between patients.
- The variety in processes for cleaning, lubricating, packing and sterilisation suggests that handpiece manufacturers need to clarify and validate their reprocessing instructions.

RESEARCH

## COMMENT

Dental handpieces are critical instruments that require thorough cleaning and sterilisation. Without proper cleaning it is impossible to sterilise them. This observational study shows that a variety of cleaning methods are used by dental practitioners in Scotland and the majority would be considered unsatisfactory by microbiologists. The survey is more authoritative in that it was observational rather than done by questionnaire. One can have some sympathy for the practitioners as there is no validated method of cleaning dental handpieces. The only acceptable method for cleaning these instruments is in a machine designed for the purpose and it is therefore disappointing that only one practice used such a machine (the 'Assistina'). The majority of practitioners used other methods or wiped them, despite a variety of handpiece cleaning machines being available.

This research highlights the need for definitive advice on dental handpiece cleaning which is supported by peer-reviewed research; at present this is lacking. It also draws attention to the absurdity of using non-vacuum autoclaves for the sterilisation of dental handpieces. These are complex pieces of equipment with integral small lumen tubing which only vacuum autoclaves will penetrate. Why all the official advice perpetrates the use of non-vacuum autoclaves for these pieces of equipment is nonsensical and unscientific; even recommending an S-type autoclave would be more logical.

This paper reports important research which draws attention to a difficult unsolved problem. What is surprising is that high-speed dental handpieces have been used for over 60 years and nobody has yet devised a safe validated method of satisfactorily cleaning them. Everyone agrees that these are microbiologically critical instruments which need careful cleaning and sterilisation. The solution may mean a complete redesign of the dental handpiece so that it can be taken apart and cleaned and then sterilised, but I doubt this will occur. I hope that Dr Smith and his colleagues will find a method of cleaning these difficult instruments. If they are successful, the imprecise, unscientific recommendations that dental practitioners are given at the moment for the cleaning and sterilisation of these difficult instruments will be history; that time cannot come quickly enough.

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## AUTHOR QUESTIONS AND ANSWERS

**1. Why did you undertake this research?**

The processing of decontaminating dental handpieces has a controversial history. It is important to obtain accurate information on current methodology and best practice to inform risk assessments and guideline development. Previous work on decontamination in dental practice used postal questionnaires with variable response rates and accuracy. We used observational methodology and standardised data collection forms to overcome limitations of previous work, aiming to provide an accurate insight into current handpiece sterilisation procedures, including cleaning and maintenance, undertaken in general dental practice in the UK.

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

Future work should examine in more detail the validation work performed on the critical control points in handpiece contamination. This includes detailing contamination before and after the decontamination process. Where is the validation in handpiece data on the efficacy of the cleaning process from manufacturers? Does steam penetrate into the handpiece lumens in non-vacuum sterilisers? What are the most effective, yet cost-effective methods for decontaminating dental handpieces in general practice? Are the current handpiece designs compatible with current sterilisation methods? Is there a need for the development of alternative cleaning and sterilisation methods due to the potential for prion transmission?