

**Advice Statement 002/17**

**April 2017**

**Would the provision of benchtop vacuum sterilisers to dental practices in Scotland provide sufficient benefit in terms of increased patient safety to justify the financial outlay and ongoing revenue costs?**



This advice has been produced following completion of Evidence Note 65 by Healthcare Improvement Scotland, in response to an enquiry from the Scottish Dental Clinical Effectiveness Programme

**Background**

Sterilisation of reusable dental instruments is the final step in an overall decontamination process. Other essential aspects include cleaning (manually or using a washer-disinfector or ultrasonic cleaner), disinfection, rinsing and drying. The effectiveness of each step is reliant on the others. Steam sterilisation is the most efficient, cost effective and safe method of sterilising reusable dental instruments in primary care dental practices.

Two main types of benchtop steam sterilisers are in use. Sterilisers which deliver a type 'N' cycle use passive displacement to remove air from the chamber to allow steam to come into contact with instruments. These are indicated for solid instruments. In steam sterilisers delivering type 'B' cycles, air removal is facilitated by a vacuum stage. This allows steam to come into contact with internal surfaces of instruments, such as dental handpieces, which have hollow components.

No information on current practice was identified. In a survey of Scottish dental practices conducted in 2004, 89% of practices which participated (n=179) had type N sterilisers, whilst 11% had type B sterilisers. The proportion of practices with a type B steriliser is likely to have increased.

**Clinical effectiveness**

- No studies were identified which provided information on patient outcomes.
- Four laboratory-type studies were identified, all of which had methodological limitations. These provided some evidence, through the use of biological indicators, that dental handpieces are not reliably sterilised using non-vacuum sterilisers.
- The association between sterilisation failure in experiments with a robust biological indicator and the risk to patient safety is unknown.

**Safety**

- No studies identified safety issues concerning the operation of benchtop steam sterilisers in the dental practice context.

## Cost effectiveness

- No cost-effectiveness analyses were identified.
- The purchase cost of a 22L vacuum steriliser is around £4,750 compared with approximately £2,700 for the same capacity non-vacuum steriliser.
- Vacuum sterilisation also has higher running costs; cost per cycle £0.22-£0.29 compared with £0.15-£0.17 for non-vacuum devices.

## Context

- Detailed discussion of the regulatory frameworks around specification, validation, testing and maintenance of sterilisation devices and specification of decontamination requirements for particular instruments is outside the scope of the evidence review.
- Scottish guidelines, extant January 2016, note that the effectiveness of sterilisation of the internal structures of dental handpieces is unclear.  
[www.sdcep.org.uk/published-guidance/decontamination/](http://www.sdcep.org.uk/published-guidance/decontamination/)
- Clarification of the national requirements for compliant reprocessing of dental devices in Local Decontamination Units (LDUs) (Primary Care) are outlined by Health Facilities Scotland.  
[www.hfs.scot.nhs.uk/publications/1479745179-Compliant%2520Dental%2520LDUs%2520in%2520Scotland%2520\(Primary%2520Care\)%2520v1.pdf](http://www.hfs.scot.nhs.uk/publications/1479745179-Compliant%2520Dental%2520LDUs%2520in%2520Scotland%2520(Primary%2520Care)%2520v1.pdf)
- Chief Dental Officer/Chief Medical Officer advice emphasises that dentists must ensure that manufacturers' decontamination instructions are followed for all instruments and decontamination equipment.  
[http://www.sehd.scot.nhs.uk/cmo/CMO\(2007\)05.pdf](http://www.sehd.scot.nhs.uk/cmo/CMO(2007)05.pdf).

## Conclusion

- Dental practices should have a rigorous cleaning process in place for all reusable dental instruments.
- Whilst there is some laboratory-type evidence that dental handpieces are not reliably sterilised using non-vacuum sterilisers there is no direct evidence to assess whether the provision of benchtop vacuum sterilisers to dental practices in Scotland would provide benefit in terms of increased patient safety to justify the additional cost.
- Manufacturers' instructions should be followed for all instruments and decontamination equipment.

### Advice context:

*The status of SHTG Advice Statements is 'required to consider'.*

*No part of this advice may be used without the whole of the advice being quoted in full. This advice represents the view of the SHTG at the date noted.*

*It is provided to inform NHS boards in Scotland when determining the place of health technologies for local use. The content of this Advice Statement was based upon the evidence and factors available at the time of publication. An international evidence base is reviewed and thus its generalisability to NHSScotland should be considered by those using this advice to plan services. It is acknowledged that the evidence constitutes only one of the sources needed for decision making and planning in NHSScotland. Readers are asked to consider that new trials and technologies may have emerged since first publication and the evidence presented may no longer be current. SHTG Advice Statements are considered for review on a 2-yearly basis. The evidence will be updated if requested by the clinical community, dependent on new published reports. This advice does not override the individual*

responsibility of health professionals to make decisions in the exercise of their clinical judgment in the circumstances of the individual patient, in consultation with the patient and/or guardian or carer.

### **Acknowledgements**

SHTG would like to thank the following individuals and organisations who provided comments on the draft Advice Statement:

- Irene Black, Assistant Director of Postgraduate General Dental Practice, NHS Education for Scotland
- Tracy Sheppard, Public Partner, Healthcare Improvement Scotland
- Professor Andrew Smith, Professor of Clinical Bacteriology, Glasgow Dental Hospital and School
- Margie Taylor, Chief Dental Officer, Scottish Government
- Christine Young, Infection Control Nurse Adviser, NHS Education for Scotland

Declarations of interest were sought from all reviewers. All contributions from reviewers were considered by the SHTG's Evidence Review Committee. However, reviewers had no role in authorship or editorial control and the views expressed are those of SHTG.

**Chair**  
**Scottish Health Technologies Group**



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