

Summary of: Operator's ability at assessing a high-speed (air turbine) handpiece before use: an audit

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FULL PAPER DETAILS

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Background The 'high-speed' (air turbine) handpiece is used extensively across many dental disciplines and the ability of clinicians to detect faulty handpieces is essential. **Aim** The primary aim of this audit was to determine the proportion of participants who could correctly identify unsafe handpieces. Secondary aims were to determine the proportion that had previous training on the topic and determine whether an educational video could improve scores. **Method** Eighty participants completed the first round of audit. They were asked to inspect seven handpieces, five of which were faulty, with three being classed as unsafe. After the intervention (educational sessions and distribution of a video) a second round of audit was completed on 69 participants. **Results** The ability to detect the three unsafe handpieces increased from 10% to 44% over the two rounds of audit. In the second round the highest score obtained was by those who had received the intervention, 77%. The lowest score, 14%, was by those who had not received the intervention. Nine percent of participants in the first round stated they had previously had training on handpiece inspection and none of these participants identified the three unsafe handpieces. **Conclusion** This audit has highlighted that there is a knowledge deficiency with regards to air turbine handpiece safety and inspection. We have shown that introduction of a simple education video can have an impact on dentists and students abilities to detect unsafe faults. We have already introduced this into the undergraduate curriculum in our school and we aim to also raise awareness within the dental community.

EDITOR'S SUMMARY

In days gone by the notion of risk was rather different to today. The word was usually applied to large scale risks such as financial disasters, air crashes or heart attacks. Of recent times the application of the concept to much of what we do has also meant that the term risk management has a more common currency, together with the acceptance that many of our actions can be graded by risk assessment. This can be applied to virtually every action that we take, not only the main activities but in analysis all the component parts as well.

This paper applies the concept to the use of the high-speed handpiece, an instrument that virtually all of us in clinical practice lift from its holder every working day at some point. Perhaps because of its familiarity and because its track record of efficiency is so high, there may be a tendency to take its maintenance and safety for granted. However, we are responsible for ensuring that all equipment is safe and

appropriate to use both for our patients, but also for ourselves and our team members. This is increasingly important in the light of growing concern over counterfeit equipment being made available on the Internet, which has been shown to be unsafe in various unfortunate cases.

Being able to detect a faulty handpiece prior to, or immediately at the outset of, clinical use is clearly an essential intuition or skill and yet as this research discovered there is almost no teaching or education in the matter to date. The effective use here of an educational input and the testing of its effectiveness through an audit cycle shows that improvements can be easily made once awareness has been raised and the essentials communicated. The problem is one which crops up often in the course of these editor's summaries, namely how and when should this educational input be provided; in an already over-full undergraduate curriculum or in the postgraduate arena?

An alternative might be the use of dental care professionals, dental nurses come immediately to mind, to be similarly trained in the signs of handpiece failure. As with many aspects of a shifting and expanding workload in clinical practice, we will have to think more creatively about how we manage our time, our tasks, certainly our safety and our risks.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 218 issue 2.

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IN BRIEF

- Highlights the importance of air turbine handpiece inspection and demonstrates a general lack of prior training and knowledge in this area.
- The audit results demonstrate an inability to consistently identify faulty and unsafe air turbine handpieces.
- Introduces a simple intervention (educational video) which can improve the ability to detect unsafe handpieces.

COMMENTARY

Even in this more preventively-focused era of dental practice, Holliday *et al.* correctly state: 'The 'high-speed' (air turbine) handpiece is used extensively across many dental disciplines.'

Therefore, managing the many risks of using these instruments is important. One way to increase the risk of harming a patient, when we have set out to deliver a health gain, is to use a faulty instrument. Their audit focuses on this risk. This paper is of value in helping us to achieve one of our central ethical obligations (avoiding harm) and to reduce the dramatically increasing litigation hazard facing our profession.

At a time when many of us feel that our regulators and guideline writers must have defined a standard for everything, the authors note that: 'There are no published guidelines on this topic.' They wisely set a standard of 100% recognition of 'unsafe' instruments.

If this study population (students and qualified staff at Newcastle Dental Hospital) represents the profession more generally, it would seem that we do have a problem in identifying faulty handpieces. Only 10% of participants correctly identified all three 'unsafe' instruments in the first phase audit. These handpieces had either, a broken chuck, a loose spray cap or a loose back cap. There was little difference in the result for students compared to qualified staff.

Holliday and co-workers found that only 9% of their study population claimed to have received training in handpiece inspection at the first audit. It would appear that we might be neglecting this topic in our training? The two audit cycles in this

paper very neatly demonstrated the value of an effective educational input. Seventy-seven percent of the study group who had viewed a training video on handpiece inspection and maintenance, between the initial audit and the phase two audit, were then able to identify all three 'unsafe' handpieces. The performance of participants who did not view the video did not improve notably.

This paper provides a stark reminder to us all to be sure that an informed team member is checking handpieces thoroughly before use. The authors sensibly suggest incorporating this task into a preoperative check list. Holliday *et al.* have clearly demonstrated how audit and appropriate training can improve patient safety.

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

The 'high speed' (air turbine) handpiece is used extensively across many dental disciplines and the ability of clinicians to detect faulty handpieces is essential. The authors noted that none of them had received any formal training in this area although all qualifying within the last 10 years from four different UK dental schools. The aim of this project was to establish if this skill was lacking within the qualified clinicians and clinical dental students in our unit. Additionally, we produced a simple educational video and observed if this improved clinicians/students ability to detect faulty handpieces.

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

We have recently presented the results of the two rounds of audit at a directorate clinical governance meeting and plan to re-audit in the near future. We have not yet met our standard criteria that 100% of clinicians/students are able to identify unsafe handpieces.

Additionally, we are currently working with the education department within our local trust to develop an e-learning package that will be included within the induction package taken by all new staff members. Once established we would like to make this available more widely to any interested parties.