Disinfecting dental impressions

Uncertainty about impression disinfection poses potential risks to the health of both dental practitioners and the receiving dental technicians. Darren Mitchell explains

Many common dental procedures involve taking a dental impression such as in the creation of crowns, veneers, retainers, bridges and mouth guards to name but a few. However, dental impressions are also a potential source of cross infection, particularly when transported between the clinical area and the laboratory. They may be contaminated with saliva or blood, which can contain both viral and bacterial pathogens, such as HIV and hepatitis A, B, and C viruses.

Generally, most pathogens cannot survive for long periods of time outside the body, but they may survive for several days in protein-containing body fluids. This means that microorganisms can be transferred from contaminated impressions to dental casts, and oral bacteria may remain viable in set gypsum materials for several days (Pandis, 2006). Pathogenic microorganisms can potentially cause both air-borne and blood borne infections if dental impressions are not effectively decontaminated. This means that direct transmission of infection could occur from patients to dental staff including dental laboratory technicians (Junevicus, 2004).

A study examining the dental impressions of 54 patients before the impressions were disinfect showed 100 per cent infection with streptococci, 56% with staphylococci, 26% with Candida and methicillin-resistant Staphylococcus aureus and 6 per cent with Pseudomonas aeruginosa (Egusa, 2008).

Dental impressions may also become contaminated with respiratory pathogens, which are coughed into the mouth from the lungs. Although, this is not common, dental impressions from 15% of patients previously diagnosed with tuberculosis were found to harbour the causative agent Mycobacterium tuberculosis (NHS Manchester, 2011). Further undermining the need for effective decontamination procedures to combat the microbial contamination which may be found on impressions.

The responsibility for ensuring impressions have been cleaned and disinfected before dispatch to the dental laboratory lies with the dental practice and HTM 01-05 states in section 7.1 states that all impressions must be decontaminated prior to sending to the laboratory.

Blood-contaminated impressions

Despite this advice, a postal survey of dentists registered with the UK General Dental Council (Almortadi, 2010) discovered that 90% of dental technicians had received blood-contaminated impressions and 19% had encountered blood-filled voids upon trimming back the periphery of impressions. In terms of disinfecting impressions, the survey found that a wide variety of solutions, often at different dilutions of the same product, were used. Only 50% claimed to disinfect all impressions and only 24% actually communicated their disinfection procedures to the dental laboratory receiving the impressions. This led the authors to conclude that: `Compliance with good practice is less than ideal and education in impression disinfection for both dentists and dental technicians is required to address this.'

Infection prevention recommendations are not always performed to the highest standards in other EU countries. A survey undertaken in Sweden, found a 72% bacterial contamination level in alginate impressions delivered to a large dental laboratory (Sofou, 2002) and only half of the dental clinics had any kind of disinfection routine.

This uncertainty about the disinfection of dental impressions is reflected in the decontamination policies of many dental laboratories, which contain specific guidance for cleaning and disinfecting dental impressions received from dental practices. Uncertainty about impression disinfection poses potential risks to the health of both dental practitioners and the receiving dental technicians.

Guidelines in section 7 of HTM01-05 give clear instructions about the management of dental impressions. Decontamination involves a multi-step process which should be carried out in accordance with the device or material manufacturer’s instructions. Impression materials cannot withstand sterilisation, adequate cleaning and disinfection must be conducted.

The following procedure is recommended (HTM01-05): a) Immediately after removal from the mouth, any device should be immersed in 1% sodium hypochlorite in room temperature water for a minimum 5 minutes. b) All devices should receive disinfection according to the manufacturer’s instructions. This will involve the use of specific cleaning materials noted in the CE marking instructions. After disinfection, the device should again be thoroughly washed. This process should occur before and after any device is placed in a patient’s mouth. c) If the device is to be returned to a supplier’s laboratory or in some other fashion sent out of the practice, a label to indicate that a decontamination process has been has been used should be affixed to the package.

Disinfection is the process used to reduce the number of viable microorganisms but may not inactivate certain viruses and bacterial spores. Dental impressions do not tolerate repeated treatment so should always be chemically disinfected to eliminate the risk of cross contamination. However, the selected disinfectant should not compromise the precision of the impression. When selecting a disinfectant for heat sensitive appliances like dental impressions, check that it is active against bacterial spores, M. tuberculosis and viruses including HIV, HCV and HBV. The disinfectant must be compatible with the material and not have a damaging effect. Products that are suitable for the disinfection of impressions are CE marked to demonstrate conformity to European directives. The manufacturers’ recommendations for the dilution of the disinfectant and immersion time should be followed. Ideally, disinfectants should not be sprayed onto dental impressions as this could reduce efficacy and may create an inhalation risk. When disinfectant sprays are used for alginate impressions, they can result in air bubbles in the cast, which may distort the quality of the impression (Nandini, 2008). So long as the recommended immersion period is strictly followed, immersion disinfectants are unlikely to negatively affect the quality of the impression surface (Nandini, 2008).

Remove uncertainty

It is good practice to agree the cleaning and disinfection process with the laboratory and label the device to indicate the disinfection status. This helps to removes uncertainty and also removes the possibility of repeated disinfection, which may detract from the quality of the impression. Obtaining accurate dental impressions is essential in many clinical restorative procedures. However, regular training is essential for all dental staff to ensure an adequate understanding of the risks associated with handling dental impressions and the correct procedures for their decontamination, including the safe use of disinfectants.

When managed well, the disinfection of dental impressions is an indispensable procedure for the control of cross-contamination.

References

7. NHS Manchester, 2011, Clinical Policy Disinfection of Dental Laboratory work and Impressions Policy.