Infection control

Aerosolized infectious material in the laser plume is just one of many concerns

By Frank Y. W. Yung, DDS, MSc

More than 20 years ago, a dental patient named Kimberly Bergalis was diagnosed with AIDS. The source of her HIV infection was her dentist. Even though the exact path of transmission is still not known, this first known transmission of HIV from dentist to patient — and the subsequent intense coverage by the media — set off tremendous confusion and panic amongst dental patients, DHCP and nearby DHCP. Although no evidence exists that HIV or the hepatitis B virus (HBV) has been transmitted via aerosolization and inhalation, there are scientific studies that confirm the risk of this possible route of contamination.5 The risk to DHCP from exposure to laser plumes and smoke is real, and along with other measures such as a strong high-volume suction, the use of a high-filtration mask is strongly recommended (Fig. 1).

Sterilization is a multistep procedure that must be performed carefully and correctly by the DHCP to help ensure that all instruments are uniformly sterilized and safe for patient use. Cleaning, which is the first basic step in all decontamination and sterilization processes, involves the physical removal of debris and reduces the number of micro-organisms on an instrument or device. If visible debris or organic matter is not removed, it can interfere with the disinfection or sterilization process. Proper monitoring of sterilization procedures should include a combination of process indicators and biological indicators, and should be assessed at least once a week (Fig. 2).

Patient-care items are generally divided into three groups, depending on their intended use and the potential risk of disease transmission. Critical items are those that penetrate soft tissue, touch bone or contact the bloodstream. They pose the highest risk of transmitting infection and should be heat sterilized between patient uses. Examples of critical items are surgical instruments, periodontal scalers, surgical dental burs, optical fibres (Fig. 3) and contact tips (Fig. 4). It is extremely important to examine, clean, polish and sterilize optical fibres and contact tips after each use. Alternatively, sterile, single-use, disposable devices can be used.

Semi-critical items are those that come into contact with only mucous membranes and do not penetrate soft tissues. As such, they have a lower risk of transmission. Examples of semi-critical items are dental mouth mirrors, amalgam condensers and impression trays. Most of the equipment in this category is heat tolerant, and should therefore be heat sterilized between patient uses. For heat-sensitive instruments, high-level disinfection is appropriate.

Non-critical items are instruments and devices that come into contact only with intact (unbroken) skin, which serves as an effective barrier to microorganisms. These items carry such a low risk of transmitting infections that they usually only require cleaning and low-level disinfection. Examples of instruments in this category include X-ray head/ cones, blood pressure cuffs, low-level laser emission devices and laser safety glasses. For low-level laser therapy, the use of a transparent barrier similar to disposable sleeves for curing lights is acceptable. For safety glasses, the use of a low-level disinfectant is suitable if it has a label claim approved by OSHA for removing HIV and HBV.

The disposal of used instruments and excised biological tissues should be managed separately. A cleared optical fibre, broken contact tips or disposable fibres should be disposed of properly in a sharps container. Harvested biological waste should be placed in a container labelled with a biohazard symbol. In order to protect the individual handling and transporting biopsy specimens, each specimen must be placed in a sturdy, leak-proof container with a secure lid to prevent leakage during transport. By following these guidelines, the spread of pathogens amongst dental patients, DHCP and their families can be prevented, and the passing of Kimberly Bergalis will not have been in vain.

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A list of references is available from the publisher.

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