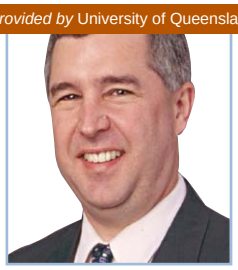

Health and safety issues in contemporary dental practice

By Professor Laurence J. Walsh

Under current workplace health and safety legislation, the owners and managers of a dental practice have a legal responsibility to provide staff with a safe working environment. In this article, the emphasis will be on four common areas of risk: posture when seated, handling scalpel blades, flooring and lighting.

Posture

The seated posture of dental staff when providing patient care poses a risk of neck and lower back disorders if individuals when seated adopt a posture where their lower back is unsupported, since this causes a greatly increased load on the intervertebral discs of the lumbar spine. It is a common habit for individuals to lean forward to improve their visibility of posterior regions of the mouth. In such a position there is no lumbar support (Figures 1-3), illumination from the operating light is impaired (Figure 2), and the hunched over position places the operator at greater risk of puncture injuries from burs and ultrasonic scalers sitting within their cradles (Figures 4 and 5). Wearing loupes or using an operating microscope can help re-train an operator to adopt a better posture. These also reduce optical strain and provide better visibility of the working field.

If magnification is not used, eyestrain can develop during intense near visual work, since the ciliary muscle of the eye (responsible for the focusing action of the lens) and the extra-ocular muscles which converge the visual axis of each eye on to the target area, become fatigued.

As most dental clinical staff spend large periods of each day in a seated position, awareness of correct posture is important for long term health. The cumulative effect of poor habits of sitting on intervertebral discs can be substantial. Damage to the fibrous outer layer of these discs (the annulus) from the daily stresses of sitting (especially when combined with twisting while seated) can lead to displacement or rupture of the disc.

Figure 1. When leaning forward with this hunched-up posture, there is no support for the lower back, and stresses on the lumbar intervertebral discs are increased.

Figure 3. This operator's upright posture will induce muscle soreness as the spinal extensor muscles support the head and neck. This operator's mask provides little protection from respiratory exposure.

When seated, right-handed operators tend to rotate their head to the right while simultaneously twisting their torso to the left. As this action is repeated many times, the muscles responsible become stronger and shorter, while the opposing muscles which act as stabilizers become weaker and elongated. Long term, such muscle imbalances can lead to distortions of posture such as "rounded shoulders".

Advice of a preventive nature for this includes avoiding actions such as: bending at the neck, arching the spine, remaining in the one position for an extended period of time, leaning forward or to the side, twisting at the torso, and leaning laterally.

Figure 2. The forward position of the head blocks most of the illumination provided from the operating light.

Figure 4. In this crouched position, the neck musculature must support the full weight of the head.

Figure 5. Both operators and chairside assistants are at risk from sharps injuries from burs in handpieces and the tip of the ultrasonic scaler when they lean across the bracket table during treatment or change-over procedures.

Figure 6. Attempting to remove scalpel blades by hand is a known high risk procedure, and does not fulfill "duty of care" requirements.

Figure 8. Placement of a large volume sharps container on the operator's side of the surgery facilitates the timely disposal of sharps during or immediately after the treatment session.

Figure 10. When planning a sterilizing room, consideration must be given to adequate lighting for the high detail tasks such as inspecting instruments after cleaning. Normal ceiling lighting, which is placed centrally, gives shadows for work undertaken on benchtops. This layout with no natural lighting would benefit greatly from wall mounted lights with pelmets above the sink area.

Scalpels

Placing and removing scalpel blades poses a substantial risk of sharps injury. Using fully disposable scalpels (which are disposed of "in toto") is one approach for eliminating this risk. Where scalpel handles are to be reprocessed, it is unacceptable to attempt to remove the blade by hand (Figure 6). A variety of devices are available for

Figure 7. Wall mounted blade removal devices, such as the Qlicksmart(tm) , can be operated using one hand and eliminate the risk of sharps injury during blade removal.

Figure 9. Surgery floors must be impermeable, a requirement not fulfilled in this case because of the cork tiles and the exposed uneven concrete. The electrical leads pose a trip hazard to staff as well as a potential electrical hazard.

safely removing blades; it is the author's preference to use devices which have one-handed operation. The Qlicksmart device (invented by an Australian surgeon) is wall mounted and will remove and capture 100 blades (Figure 7). It can then be disposed of in the same way as a sharps container.

It is prudent to have a sharps container close to the operator to facilitate their task of disposing of sharps such as local anaesthetic needles. The author uses the SafetySmart(tm) system for which it is not necessary to dis-assemble the syringe unit; rather it is disposed of as one unit. A large sharps container placed on the bench or mounted on the wall on the operator's dominant side can be reached easily during a procedure (Figure 8). Ideally this should be located well above floor height to prevent access by children. While it is appropriate to use a chute above an appropriately lined underbench waste bin for clinical waste, chutes penetrating through the benchtop can be problematic if they feed a sharps container within a cupboard, since the sharps container can easily become over-filled. When this occurs, sharps will spill from the container and the chute when removing the container. To prevent this occurring, the sharps container in the cupboard must be checked each day, and disposed of when three quarters full.

Flooring

Current recommendations are that the flooring in treatment areas, sterilizing and laboratory areas is non-slip and made of a smooth, impermeable seamless material, such as welded vinyl. Materials such as carpet and cork tiles are not impervious, and readily absorb spilt materials (Figure 9). Areas which may become wet with splashes of water or body fluids pose a slip hazard to staff and patients, while uneven floors and unsecured cables pose a trip hazard.

Lighting

Great attention is often paid to natural and artificial lighting in the treatment rooms and reception areas, however it is commonplace to find inadequate lighting in the sterilizing area. Under national occupational health and safety standards, for extra-fine work (defined as that involving tolerances below 25 microns), the minimum light level should be 1600 lux. For computer work, the minimum level is 600 lux, while for routine work, the minimum level is 400 lux. This issue is particularly relevant for the sterilizing area, where staff are required to inspect instruments for visible bioburden and debris, and for the integrity of cutting edges.

Overhead (ceiling) light can give rise to shadows for benchwork, as the light source is above and behind the worker's head (Figure 10). Lighting placed on the wall immediately above the instrument cleaning area, or beneath overhead cupboards, is an obvious solution to this problem, providing high level illumination to aid the instrument inspection task. For wall-mounted lights, nuisance glare can be prevented by using a pelmet to direct the light downwards and away from eye level.

Professor Laurence J. Walsh is the technology editor of Australasian Dental Practice magazine. He is also a noted commentator on and user of new technologies and is the Head of The University of Queensland School of Dentistry.