

CPD:
ONE HOUR

The infected oral healthcare worker

CPD questions

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What risk does the dental team pose to patients when they are infected with a chronic blood borne disease? Are the standard precautions enough to protect patients from infected members of the dental team or should their range of clinical duties be modified or even stopped? This article has been adapted for *BDJ Team* from the *BDJ Clinician's Guide: Infection control in primary dental care*, by co-author **Nikolai R. Stankiewicz**.

HIV

When faced with this dilemma at the beginning of the HIV/AIDS epidemic, different regulatory bodies took varying approaches. In the UK, a hard-line approach was initially taken, and members of the dental team had to cease work immediately. By 1987 the UK had convened an advisory panel that set the ruling that dentists could undertake a significantly reduced number of clinical duties, more or less limited to making full dentures only. This rationale in part was based on the supposition that teeth are sharp and could result in the infected worker cutting themselves and bleeding into the patient's mouth. No such restrictions were imposed on the dental team in the USA or Canada.

HIV prompted a paradigm shift in dental infection control, part of which was driven by public perception, expectations, fear and misunderstanding. However, health care policy should be framed by a sound evidence base, not fear. The 6th World Workshop on Oral Health and Disease was held in Beijing in 2009. At this conference the evidence for the risk of transmission of HIV from the dental team to patients was analysed. From this emerged a four-point strategy for HIV positive oral healthcare workers called the Beijing Declaration.

1. The team member receives continued care by a suitable HIV health care professional.
2. The team member remains aware of their health status and acts accordingly
3. Standard infection control is practiced
4. HIV transmission scientific evidence is reviewed.

(From Challacombe S J. Beijing Declaration 2009. *Adv Dent Res* 2011; **23**: 6.)

The evidence does not support the blanket banning of the HIV positive dental team member. Nor does it support the restriction of duties to the edentulous mouth. An exposure prone procedure entails the gloved hands of a clinician not being fully visible at all times during surgical procedures, where the use of both sharp instruments and potentially sharp body tissues could cut the clinician (Table 1). This could then result in bleeding into the open wound of the patient. Classifying teeth as a potentially sharp body tissue would make a lot of dental care an exposure prone procedure. The evidence does not support this and the risk of a cut to the gloved hand from a patient's tooth that bleeds and then infects the patient is negligible.

Despite the outcome of the Beijing Declaration there remains significant variation throughout Europe in the way HIV positive dental team members are treated. In some

countries, all treatment is banned, others rule exposure prone procedures are prohibited, some require the individual to double glove, and others have no restrictions or obligations to report their HIV status at all. It was a welcome relief, albeit too late for some, that the scope of duties the HIV positive dentist could undertake in the UK was revised in 2016 with the ability to treat dentate patients.

Hepatitis B

Hepatitis B is far more infectious than HIV, requiring fewer viral particles to establish an infection. Less than 5% of adults who contract Hepatitis B will become chronic carriers although children are at a much higher rate (as much as 80%). All the dental team are advised to get Hepatitis B vaccination at the start of their training if they have not already done so; not all do so. There will be team members who already have chronic Hepatitis B prior to their training and those who become infected once they have started, with a higher risk in resource poor regions of the world and where Hepatitis B is endemic. There have been, albeit rare, cases of dentist to patient transmission of Hepatitis B virus, therefore it is important to risk assess and manage members of the dental team who are infected. Where Hepatitis B virus DNA levels are sufficiently low (below 200 IU/ml) and the person is HBeAg negative it would seem the risk from undertaking exposure prone incidents is negligible. Regional rules will of course dictate what duties and tasks infected members of the dental team can undertake, if at all, regardless of the current evidence.

Hepatitis C

Hepatitis C is an insidious infection that may present with similar or milder symptoms to Hepatitis B. Unlike Hepatitis B, the chance of becoming chronically infected is as high as 80% (Fig. 1). Clinician to patient, patient to patient and patient to clinician transmission of Hepatitis C have all been documented in healthcare. In 2013 a dental clinic in the

Table 1 Examples of exposure and non-exposure prone dental procedures as defined by the United Kingdom Advisory Panel for Healthcare Workers Infected with Bloodborne Viruses

Non-exposure prone procedures	Exposure prone procedures
Removable prosthodontic procedures including impressions	Administration of local anaesthetic
Using ultrasonic scalers	Using hand scalers
Routine examination	Extraction of teeth
Taking radiographs (both extra and intra oral)	The preparation of teeth using a high-speed hand piece
	Root canal treatment

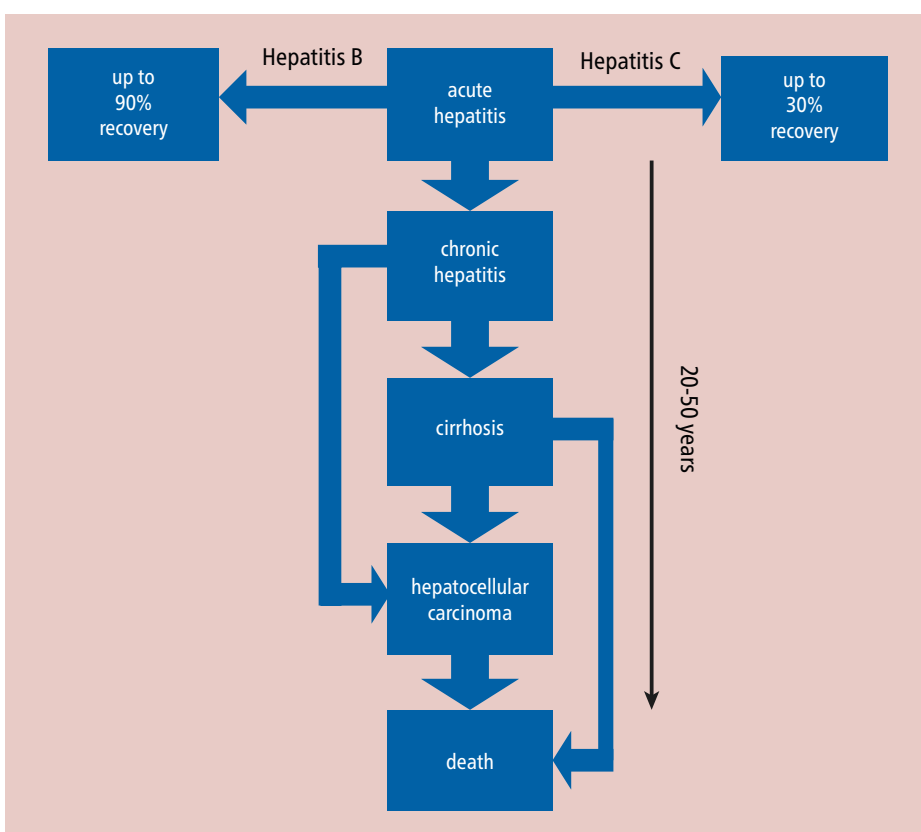


Fig. 1 Disease progression of viral hepatitis

‘HIV prompted a paradigm shift in dental infection control, part of which was driven by public perception...’

USA was forced to close after Hepatitis C was transmitted between patients most probably via contaminated multi use vials of medicine for intravenous sedation. Cases of transmission from the health care worker to patient have been associated with two groups: infected surgeons who do exposure prone procedures and those undertaking invasive

procedures without wearing gloves. No cases of the dental team infecting patients with Hepatitis C have been documented at the time of writing.

Whilst there is no vaccine (yet) against Hepatitis C, there are antiviral medicines that are very effective. The efficacy will depend upon the strain of the virus and may require the

use of multiple drugs for an extended period. Treatment does not confer immunity, so the risk of reinfection remains after treatment.

Other infections

Acute childhood viruses, respiratory and gastrointestinal infections can easily be spread to the community. Where a member of the dental team is acutely ill, they should remain at home until they have recovered. This will protect both other staff members and patients. Sickness presenteeism is a neologism that describes those that are unwell but come to work anyway. Motivation for attendance may be due to the expectations of the management culture of the business. Acutely infectious staff should not be working, and this should be reflected in the way dental practices are run as businesses too.

Sharps injuries

There is no shortage of sharp instruments in a dental surgery that have the potential to cut those handling them. Where the skin is cut by a dirty sharp instrument it is called a sharps injury. Of concern are used hollow bore needles, as they have the potential to contain infected blood or body fluids which may result in transmission of the disease to the injured person. This is also referred to as a needle stick injury.

The primary concern (but not limited to) following a sharps injury is inoculation with HIV, Hepatitis B or C. These viruses have different likelihoods of successful infection. HIV has a one in 300 chance, Hepatitis C a one in 30 chance and Hepatitis B a one in three chance of being transmitted from contaminated blood in a needle stick injury. As most members of the dental team should be immunised against Hepatitis B, this makes Hepatitis C the most likely virus to result in an infection if it is in the contaminated sharp.

A sharps injury is potentially a medical emergency. It is imperative that all staff know what to do in the event of a sharps injury and that there is a protocol in place that outlines the management for such an event.

Advisory posters that simply and clearly outline sharps first aid management should be in every dental practice. Four simple measures used on many advisory posters in the UK are:

1. Bleed it
2. Wash it
3. Cover it
4. Report it.

The wound site should be gently squeezed to encourage bleeding, whilst also washing it under running water and cleaning the site with soap. These measures aim to reduce contamination at the wound site, potentially lowering the number of infectious particles

below the threshold of transmission of infection. Covering the wound with a bandage protects the area from secondary infection.

Multiple studies indicate that sharps injuries are under reported. Within an organisation this may result in risks not being identified and appropriately controlled. For the injured worker, it might mean that the best care has not been sought and may pose problems with insurance and legal claims in the event of infection but no documentation of the incident.

Algorithms have been developed to assess how a sharps injury should be managed after first aid has been administered. For a high-risk injury, time is imperative and seeking advice should not be delayed. It is therefore prudent to have the contact numbers on a sharps poster for both an occupational health service and the closest hospital that provides emergency care. Where a sharps injury has been determined to be high risk then post exposure prophylaxis (PEP) treatment should be sought. PEP protocols should be in place and set by local health organisations and care providers.

First aid kits should have suitable dressings for a sharps injury. Eyewash should also be available in the event of a body fluid splash in a team member's eyes. The mucosal membranes of the eyes are a potential route of entry for the spread of infection. Copious flushing of the eyes aims to dilute any contamination.

Healthcare workers are only too aware of the potentially life altering consequences acquiring a blood borne infection will have following a sharps injury. It is worth noting that some studies have identified healthcare workers who have developed post-traumatic stress disorder following a sharps injury, even though they have not become infected. In the UK, the greatest morbidity factor associated with a sharps injury is probably anxiety, as this is a region where the risk of blood borne infections is relatively low. Employers and colleagues should be mindful of this as there might be the need to offer both emotional and psychological support.

Safer sharps

Several regions and countries have legislated on the use of safer sharps. The USA's Needlestick Safety and Prevention Act of 2000 was brought in to mandate the use of engineering controls to reduce the risk of sharps injuries to health care workers. Engineering controls are considered a reasonably effective way of managing risk (Fig. 2). Sharp instruments and devices with safety features that aim to reduce the likelihood of injury are termed safer sharps (Fig. 3). Likewise, EU Council Directive 2010/32/EU on the use of safer sharps became

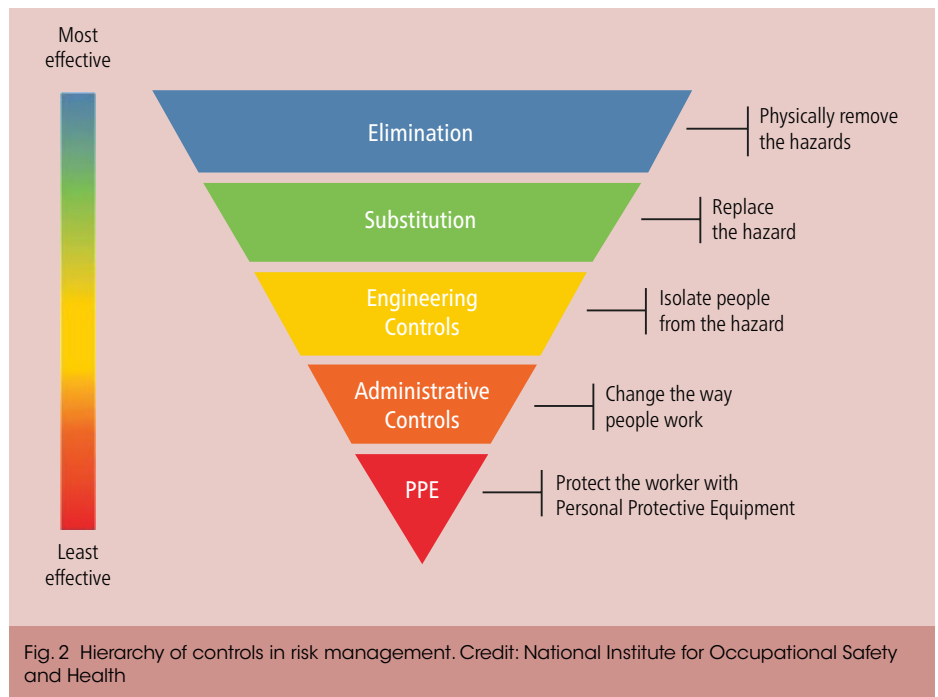


Fig. 2 Hierarchy of controls in risk management. Credit: National Institute for Occupational Safety and Health



Fig. 3 An example of a safer dental syringe/needle system. Note the safety sheath is retracted to expose the needle then pulled back after use and prior to disposal

mandatory in 2013 for member states. This law was a recognition of the risk sharps injuries posed to numerous healthcare workers, including the dental team. A key element of this change was to mandate the use of safer sharps where possible. For dental care, this not only includes safer syringe/needle systems for local anaesthesia, but also scalpels and cannula for IV sedation. Under no circumstances should needles be recapped with two hands. Where a safer system is not in use, recapping aids should be used or at worst, a single-handed scoop method to recap the needle.

Too many dental nurses will have experienced a sharps injury when clearing up after patient treatment. Clinicians have a responsibility to ensure a safe working

environment for both themselves and their colleagues. The simple principle that the person who generates the sharp disposes of the sharp should be followed and be part of the practice written protocols.

Single use sharps are a hazardous waste that must be disposed of in approved containers that are suitably sited (Fig. 4). A sharps container should meet an established standard that gives confidence the contents won't be able to pierce through or leak out (eg BS EN ISO 23907). Containers must be kept off the floor and out of the reach of children. Where the surgery layout allows, wall mounting the sharps container close to the clinician is a good choice as the sharps can then be disposed of without moving



Fig. 4 A wall mounted sharps container close to where sharps are generated allows the clinician to dispose of them safely

around the room. Some safer syringe systems are relatively large compared with traditional hub style needles, and may readily fill a sharps container, so be mindful not to overfill containers as this may not allow correct closure of the sealing lid posing a risk to anybody handling the full container.

Other measures to reduce the risk of sharps injury include not using wire bur brushes to decontaminate instruments. Bur brushes are ineffective at cleaning burs and the sharp wire bristles expose staff to an unnecessary hazard. The use of non-foaming detergent when manually cleaning instruments ensures staff can see what they are doing. Instrument cassettes which reduce handling of contaminated instruments and using automated cleaning instead of manual scrubbing (an ultrasonic bath or thermal washer disinfector) also reduces risk by using engineering controls and safer alternatives (Fig. 5). There is evidence to suggest that most sharps injuries to dentists are from dental burs, so clinicians should be mindful of dirty burs remaining in handpieces which sit on delivery units (Fig. 6). Likewise used ultrasonic scaler tips left pointing upwards after use are a hazard too. These instruments all have the potential to scrape and injure the clinician's arms or hands.

Further reading

1. Bagg J, Roy K, Hopps L *et al.* No longer 'written off' - times have changed for the



Fig. 5 Instrument cassettes loaded in a thermal washer disinfector



Fig. 6 Dirty burs in handpieces can be a potential sharps hazard when resting in the delivery unit

- BBV-infected dental professional. *Br Dent J* 2017; **222**: 47-52.
2. Pereira M C, Mello F W, Ribeiro D M *et al.* Prevalence of reported percutaneous injuries on dentists: a meta-analysis. *J Dent* 2018; **76**: 9-18.
3. Pozzetto B, Memmi M, Garraud O, Roblin X, Berthelot P. Health care-associated hepatitis C virus infection. *World J Gastroenterol* 2014; **20**: 17265-17278.
4. Riddell A, Kennedy I, Tong C Y. Management of sharps injuries in the healthcare setting. *BMJ* 2015; **351**: h3733.

To purchase the BDJ Clinician's Guide: *Infection control in primary dental*

care, visit <https://www.springer.com/gb/book/9783030163068>. A review of this book, originally published in the *BDJ*, also appears in this issue of *BDJ Team*.

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