Does infection control guarantee safety?

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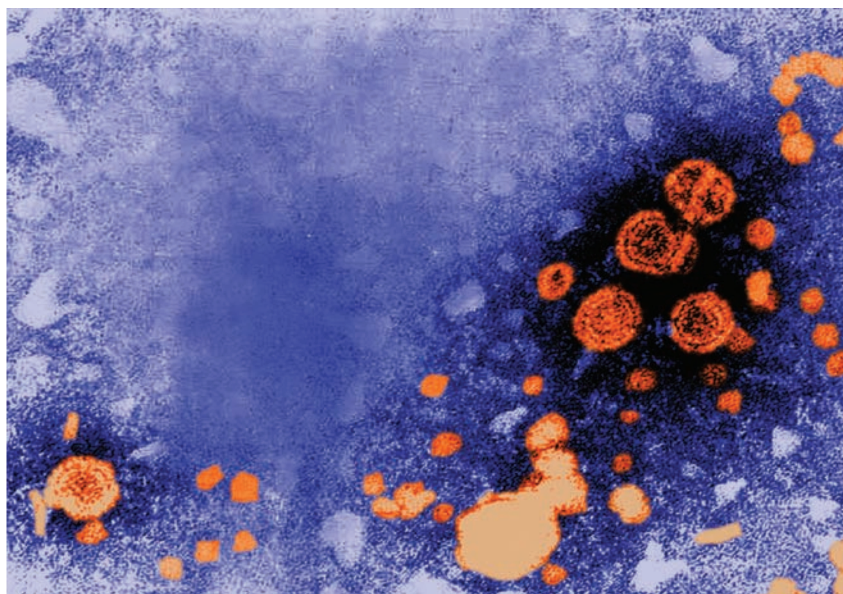
Whilst it is impossible to guarantee that dental or medical procedures can be performed without any risk of the transmission of infection, strict adherence to standard precautions and accredited infection control protocols will reduce this risk to an absolute minimum. A breakdown in the chain of infection control procedures is more often due to human error rather than to equipment failure. These mistakes by staff can be accidental but more often are due to lack of knowledge and training, inattention, tiredness, illness, pressure of work causing short cuts to be taken and at times, unfortunately, to deliberate breaches of protocols. This article will detail some of the recent incidents in both dental and medical practice in Australia and the United States which have placed patients at risk of contracting hepatitis B (HBV), hepatitis C (HCV) and HIV or caused transmission of these blood borne viruses.



A digitally-colourised transmission electron micrograph (TEM) revealing the presence of hepatitis B virions. The large round virions are known as Dane particles.

In November 2009, the Queensland Health Department stated that 235 patients at the Bundaberg hospital dental clinic had been treated with instruments which had been cleaned but not sterilized. All instruments including 14 critical instruments and been manually and ultrasonically cleaned, then bagged and placed in an autoclave for steam sterilization. The autoclave was not switched on and later another staff member noting that the autoclave was cold, removed the bagged instruments without checking the autoclave print out to ascertain that the correct temperature, pressure and time had been reached nor checking the correct colour change in the class 1 chemical indicators on the exterior of the bags and took the instruments into the surgery to be used. A week passed before the mistake was realized. Blood tests of all 33 patients whose instruments had not been properly sterilized were

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"These mistakes can be... due to deliberate breaches of protocols. In Florida, Health officials found that 3 patients had contracted HCV after a HCV carrier technician was found to be injecting himself with potent narcotics intended for patients and then refilling the used vials with water..."

negative to blood borne viruses and tests of all 235 treated patients showed that no transmission of hepatitis B, hepatitis C or HIV had occurred.

Again in April 2010, the Queensland Health Department reported that four Mackay primary schoolchildren had been treated with non-sterile dental instruments. Investigation showed that the instruments had been cleaned and bagged and were on the bench awaiting steam sterilization as the autoclave was temporarily out of water. A member of staff presumed the instruments had been processed and failed to check sterilization parameters before releasing the instruments for use. Fortunately blood tests of the students showed no transmission of infection had occurred.

The Western Australian Health Department revealed in April 2010 that it had suspended an anaesthetist as nurses at the Port Headland hospital had raised concerns that about his reuse of a secondary line for the administration of anaesthetic drugs for endoscopy or colonoscopy (a line procedure 20 years out of date) exposed the patients to the risk of the transmission of blood borne viruses. The doctor was suspended pending the investigation of 450 patients who had been treated over the past two yeas. Of the 315 previous patients who had been tested, all were negative to HBV, HCV and HIV.

In the Journal of Gastroenterology dated July 2010, it was reported that an anaesthetist who reused contaminated single-use propofol vials on multiple endoscopy patients transmitted hepatitis B infection to 13 patients at 2 clinics. Investigators who carried out infection control assessments, reviewed medical charts, interviewed patients and performed molecular sequencing on available patient isolates found 6 cases of HCV infection and 6 cases of HBV at one clinic and one case of HCV infection at the other clinic. They found that the anaesthetist reused syringes to withdraw further necessary doses of propofol during anaesthesia from new single use vials of the drug thereby contaminating the vials but then used the contents of those same contaminated vials on later patients.

An unusual outbreak of Hepatitis B infection occurred in August 2010 at a Wayne County, USA assisted care centre where staff used the same blood glucose monitors on different residents. By November of the same year, five of the residents had died of HBV infection whilst three others contracted the disease but survived. The deceased ranged in age from 63 to 83. Investigators could not identify the source of the virus but diabetic patients are more susceptible to infections than non-diabetics. 27 non-immune patients were vaccinated against HBV. As glucose monitors had been previously stored together and cleaned but not disinfected, health officials recommended that glucose monitors be stored in each resident's room, that they be disinfected after use and single use needles be used. (In November, S. Berger reported that 18 outbreaks of Hepatitis B had occurred in the USA during 1990 to 2009 due to improper use of glucose monitoring equipment.)

In September 2010, the prestigious Mayo clinic in Jacksonville, Florida, USA, began sending letters to 500 former patients suggesting that they present for blood tests for HCV as there was a possibility that the disease had been contracted during previous surgery or transplants. Health officials had found that three patients at the clinic had contracted HCV; one of these had died from HCV, one died from an unrelated disease and one was still alive. Investigation revealed that a HCV carrier technician who had worked for 4 years in the interventional radiology department was injecting himself with potent narcotics intended for patients and then refilling the used vials with water which were then used for injecting patients. The technician has been discharged but also has been arrested on a minor felony charge related to stealing drugs.

In Victoria (Australia), the lay press has been replete since June 2010 with articles concerning the 44 women reported at that time by the Chief Health Officer to have contracted HCV at a Croyden late abortion clinic where an anaesthetist, Dr J Peters, a known HCV carrier, worked over an 18 month period in 2008 and 2009. Genetic analysis of the virus showed that 9 cases were linked directly to Dr Peters. In August 1996, Dr Peters had been given a 6 months suspended jail term after pleading guilty to 20 charges of providing his wife with a 2-year non-stop supply of pethidine. He was also suspended by the Medical Board of Victoria on February 15 and both the police and the Health Department are investigating how the disease was transmitted as to date, no exact cause has been found. The investigation has now been widened to include 3000 women who have been anaesthetised in the past by Dr Peters including 55 now in New Zealand. Of the almost 1000 Australian women contacted, 746 have been tested with 44 found to have HCV infection.

Consideration of the above reports is particularly of interest to dentists because despite serious breaches in the processing of reusable dental instruments, neither HBV, HCV or HIV was transmitted to patients. This might just be fortuitous but it emphasizes the importance of properly cleaning instruments without obviating the need for steam sterilization. Further, there have been no reports of drug addicted dental care providers placing patients at risk. This is in contrast to medical practice where some drug addicted health care providers have been shown to transmit these blood borne viruses to patients by deliberately self injecting drugs intended for patients and then reusing contaminated syringes/drug vials on the patients.

About the author

Dr Vincent C Amerena is the infection control editor of Australasian Dental Practice. He is a retired periodontist who now works as an infection control and risk management consultant. He has been instrumental in the drafting of infection control guidelines nationally and lectures extensively to assist dental practices, dental laboratories and denture clinics in ongoing compliance.