Accepting the Need for "Overkill" in Infection Control

· **Trey Petty**, DDS ·

© J Can Dent Assoc 2000; 66:186-7

I read with detached bemusement and sad familiarity the letters to the editor and other recent writings of Dr. John Hardie in this journal, and the voices of others on a national, provincial and local level that seek to dilute the importance of strict infection control in dentistry. It reminds me of recurring, frustrating conversations I have with a dear friend I have known since childhood. She is a university-educated mother of four who firmly believes that standard immunizations are dangerous; that fluoride in the water causes cancer; that AIDS was a government experiment gone bad; that the military is hiding the truth about UFOs and a variety of other anti-science rantings commonly found in newsgroups such as alt.folklore.urban and other nefarious places on the Internet.

The fact that individuals may have agendas to promote and somehow acquire platforms from which to proclaim them does not, in and of itself, prove that any sort of controversy actually exists. Only in the past decade and a half or so has dentistry finally arrived at a place in infection control where the rest of the health sciences in the industrialized world have been for nearly a century. The idea that such basic concepts as aseptic procedures (i.e. universal precautions) are being questioned by influential people in our profession is an embarrassment to dentistry as a whole and would certainly be unthinkable in other health care settings.

Yes, performing dentistry while practising proper infection control according to CDA, ODA, RCDS, ADA, CDC, OSAP, OSHA or whatever acronymical authority we ascribe to this month has definitely made our practices and our lives more complicated. However, the modern reality is that the health care professional community needs no further impetus to prove that dentistry should now be doing what we should have been doing decades ago when it was discovered that hepatitis B is caused by a virus that can be found in the blood and saliva.

I have grown weary of hearing the rhetoric mantra, "Where's the scientific proof?", with regard to infection control in dentistry. Well, "they" can pull out their list of references and I can pull out mine. Consider the following brief sampling:

We KNOW that many viruses are not as easy to inactivate as we once thought.[1]

We KNOW that live blood cells, bacterial and viral particles can survive inside our handpieces even after thorough disinfection.[2]

We KNOW that handpieces "inject" material into tissue.[3]

We KNOW that our dental unit waterlines and evacuation system lines are grossly contaminated.[4]

We KNOW that patients can easily suck bacteria back through saliva ejectors.[5]

We KNOW that cross-contamination of X-ray films can occur in the processor.[6]

We KNOW that toothbrushes and dentures can transmit disease.[7]

We KNOW that no disease reporting system exists that is capable of detecting widespread low frequency cross-infection.[8]

We KNOW that infectious patients lie to us about their infections.[9]

What more evidence could we possibly need of the necessity for strict infection control, including standard and universal precautions, in dentistry? Evidence may not be absolute proof, but it certainly is the basis of most of the scientific clinical decisions we make every day.

What sort of scientific experimental design will it take to convince those still waiting for "scientific proof;" those that decry the lack of "scientific evidence?" Researchers will have to: first, radioisotope label a virus (this is currently technically impossible); second, infect someone with this theoretical virus (this would never get through an ethics committee); third, perform a dental procedure on this patient, and then, without properly sterilizing all the equipment and instruments in between procedures, perform another dental procedure on another person using the same equipment (again, ethics committee problems) in order to detect the same technically impossible, theoretically labeled virus. Well they may as well quit waiting: such experiments will never happen.

While we must always strive to practice evidence-based infection control, the reality is that the level of evidence may not always be as strong as we would like it to be. One of the biggest gaps in our infection control knowledge is knowing

the risk of acquiring an infectious disease in a given situation. If such risks could be known, they would help justify the importance of, or need for, a particular infection control procedure.

There are two aspects to consider with such risks. One is the risk of cross-contamination (the transfer of microbes from one person to another). The other risk is of cross-infection (the actual occurrence of infection following cross-contamination).

If there is evidence of cross-infection, then one knows that cross-contamination must have occurred. Likewise, if cross-contamination occurs, there is some potential for cross-infection. We would all like to have cross-infection evidence as the basis for using a given infection control procedure. For example, the evidence for the involvement of sharps injuries in cross-infection of bloodborne diseases provides a solid and unquestioned foundation for using infection control procedures to prevent sharps injuries among health care workers.

Unfortunately, we do not have such strong evidence to support all of the recommendations for infection control. We must, instead, rely on cross-contamination data that, at least, establishes some degree of potential for cross-infection. For example, while less information exists about cross-infection in dentistry involving ungloved hands, dental aerosols, contaminated dental unit water or contaminated dental operatory surfaces, it is clear that all of these can involve cross-contamination and, therefore, some potential for cross-infection.

Since we can neither predict nor measure all situations that will cause a cross-contamination to result in a cross-infection, a certain amount of overkill is built into modern infection control recommendations to assure the best protection for patients and dental health care workers. Performing infection control to reduce cross-contamination gives the body a better chance to defend itself against infectious agents.

The bottom line is that we do not always know when we may be exposed to potentially virulent microbes. We never know the exact composition of a source of microbes involved in contamination of an environmental surface, dental unit water or air, saliva, blood or skin. We do not know when the entrance of microbes into the body may be enhanced through unrecognized breaks in the skin or mucous membranes. We do not know when our resistance to a given microbe may be low.

All of these unknowns tend to foster a certain level of "overkill" at all stages in infection control. The absolute science may not be there, but we are a profession that holds the safety of our patients in our hands. We need to err on the side of caution. The best defense is a good offense; we need to be too safe. I would rather that than, in the interests of saving money or not seeming foolish or fearful or whatever our excuses have been, to find out at some later date that we were not safe enough.

The Latin phrase, *primum non nocere* applies as always: our first concern should be to do no harm. Some people may call it overkill; I call it being safe. Our approach to overkill in the absence of confirmatory science is best summarized by what my grandfather always told me: "It is better to be safe than sorry."

Dr. Petty is the director of dentistry and oral medicine at the Foothills Medical Centre and director of oral medicine and surgery at the Tom Baker Cancer Centre in Calgary, Alberta. He is past-chair of the CDA Committee on Community and Institutional Dentistry and author of the CDA's Workbook on Infection Control.

The views expressed are those of the author and do not necessarily reflect the opinion or official policies of the Canadian Dental Association.

References

1. Sattar SA, Springthorpe VS. Survival and disinfectant inactivation of the human immunodeficiency virus: a critical review. *Rev Infect Disease* 1991; 13:430-47.

2. Lewis DL, Arens M, Appleton SS, Nakashima K, Ryu J, Boe RK, and others. Cross-contamination potential with dental equipment. *Lancet* 1992; 340:1252-54.

3. Lewis DL. Infection control in dental handpieces. *Am Soc Microbiol* 1991; 57:393.

4. Williams JF, Johnston AM, Johnson B, Hutington MK, Mackenzie CD. Microbial contamination of dental unit waterlines: prevalence, intensity and microbiological characteristics. *JADA* 1993; 124:59-65.

5. Watson CM, Whitehouse RL. Possibility of cross-contamination between dental patients by means of the saliva ejector. *JADA* 1993; 124:4:77-80.

6. Stanczyk DA, Paunovich ED, Broome JC, Fatone MA. Microbiologic contamination during dental radiographic film processing. *Oral Surg Oral Med Oral Pathol* 1993; 76:112-9.

7. Glass RT. The infected toothbrush, the infected denture, and transmission of disease: a review. *Compendium* 1992; 13:592, 594, 596-8.

8. Dunn OJ. Basic statistics: a primer for the biomedical sciences, 2nd ed. Toronto:Wiley, 1977. p. 4-7.

9. Perry SW, Moffat M Jr, Card CA, Fishman B, Azima-Heller R, Jacobsberg LB. Self-disclosure of HIV infection to dentists and physicians [published erratum appears in *JADA* 1993; 124:201]. *JADA* 1993; 124:9:51-4.