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The Infection Control Practices of General Dental Practitioners

To the Editor:

In their recent article, "The Infection Control Practices of General Dental Practitioners" (*Infect Control Hosp Epidemiol* 1997;18:699-703), McCarthy and MacDonald have assumed that the wearing of gloves and masks indicates compliance with universal and effective dental infection control procedures. This simplistic conclusion ignores a number of confounding variables.

1. Hand washing is an integral and essential aspect of all clinical infection control practices. The study failed to determine if, how, and when hand washing was performed.

2. The abuse of glove use does exist. Gloved hands are used to handle charts, answer telephones, and greet patients. The authors did not assess the degree of this abuse.

3. The techniques used to place and remove masks are critical if the circle of protection is to remain intact. This variable was not determined.

4. All gloves and masks are not equally effective. The investigators did not ascertain which brands were used or if their efficacy had been tested against a gold standard.

Without attention being given to these variables, it is impossible to determine from the paper any meaningful or insightful information on the infection control procedures of general dental practitioners. Crude studies of this type served a purpose in the early to mid-1980s as initial data were collected in response to the hysteria associated with acquired immunodeficiency syndrome. However, for some time, it has been known that compli-

ance with Universal Precautions was not total and that the costs and restrictions imposed by mandatory recommendations have been of concern to practitioners and administrators of healthcare facilities. In recent months, the Canadian Dental Association and the Canadian Medical Association have adopted the policy that public health issues, such as infection control procedures, should be based on substantive evidence that a public health threat exists and that measures to reduce the threat (if it is present) are effective. The policy emphasizes that changes to established procedures are not justified by public perception of a threat.

Rather than conduct meaningless surveys, investigators such as McCarthy and MacDonald would be advised to do the following:

1. Definitively identify which diseases have been transmitted by dental procedures;

2. Establish the risks and cofactors associated with these transmissions;

3. Using the principles of evidence-based care, prove that recommended preventive techniques are effective, safe, and economical.

Such important data will permit dentists to make informed decisions on infection control procedures and allow rational monitoring of nosocomial infection rates in dental practice. Surely these goals will be more influential than discovering the percentage of dentists who always, sometimes, or never wear gloves.

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The authors reply.

We would like to thank Dr. Hardie for his interest in our recent paper "The Infection Control Practices of General Dental Practitioners." His response is puzzling: We did not conclude or assume that wearing gloves and masks indicated compliance with universal and effective infection control procedures. Our conclusion was that additional education was required to promote a more realistic perception of risk of human immunodeficiency virus (HIV) transmission in the dental office and the use of rec-

ommended infection control practices, including Universal Precautions.

We share Dr. Hardie's concern related to hand washing. The questionnaire used in this study included items on sociodemographics, infection control practices, and attitudes and knowledge related to HIV. The number of infection control items was limited because of concerns that a larger number would compromise the response rate. Follow-up data (including data on hand washing) originally were included but were omitted from the final manuscript to aid brevity and clarity. We noted in the "Discussion" section of our article that more comprehensive data were required and that we had completed a national survey of infection control practices of dentists in Canada to achieve this. Of the respondents in the national study, 76% reported routine hand washing before treating patients, and 63% reported always washing their hands after removing gloves.¹ Interestingly, of those who did not report routine use of gloves, 100% reported hand washing between patients.

Dr. Hardie states that crude studies of this type served a purpose in the early to mid-1980s. Although studies using convenience populations or with very low response rates can be described as crude, we believe that our surveys do not fall into this category. Our questionnaires were developed using test-retest procedures to test the reliability of items; survey administration was investigated using telephone, confidential mail, and anonymous surveys; and Dillman's guidelines for mailed surveys were used to achieve good response rates. Although our response rates for the provincial (N>5,000) and national (N>6,000) surveys were 70% and 66%, respectively, we also investigated late response and nonresponse bias.

The goals listed by Dr. Hardie for future endeavors have some merit but are not without problems. First, the identification of infections transmitted by healthcare workers (HCWs), including dentists, is difficult because of subclinical infections, the difficulty of linking isolated sporadic cases with a specific HCW, costs of look-back and trace-back investigations, poor compliance by patients with look-back studies, and the fact that there frequently are multiple opportunities for transmission of some pathogens in social, as well as healthcare, settings. Despite the difficulties inherent in epidemiological

investigations, there is evidence of transmission of pathogens during dental procedures, including hepatitis B virus (HBV),^{2,3} tuberculosis,⁴ herpes,⁵ and HIV.⁶ Since Universal Precautions were introduced in 1987, there have been no reports of transmission of HBV from a dentist to patients, probably as a result of increased use of gloves and more careful handling of sharps. However, we cannot be certain that transmission has not occurred, for the reasons discussed above. Certainly, complacency related to transmission of HBV or other pathogens in the dental office would be ill-advised.

Second, studies of risk factors associated with transmission of pathogens are limited by the difficulty of identifying cases of transmission and dealing with retrospective data. This was well illustrated by the investigation of transmission of HIV from a Florida dentist to six patients.⁶

Third, there are problems inherent in studies of effectiveness of a procedure such as hand washing, as has been well described.⁷ Healthcare professionals are obligated to do no harm. The ability to test the efficacy of an intervention to reduce transmission of a pathogen can be limited by ethical considerations. If we wait for definitive evidence that a specific infection control procedure is effective and economical before including it as routine practice, the risk of cross-infection will increase.

Currently, there is a considerable controversy in Canada as a result of the publication of recommendations concerning healthcare workers infected with bloodborne pathogens. The most controversial recommendation is that healthcare workers who are hepatitis B surface antigen- and hepatitis B e antigen (HBeAg)-positive should cease practice. The recommendations are based on evidence of HBV transmission from HBeAg-positive surgeons to patients despite the use of recommended infection control procedures.⁸ The new recommendations include the use of look-back and trace-back investigations. Although these would provide more evidence related to transmission of bloodborne pathogens from HCWs, including dentists, there is ongoing discussion related to costs and benefits. Our data from recent studies of dentists and surgeons support other recommendations, including HBV vaccination and serological testing,

appropriate follow-up after occupational injuries, more education, and monitoring of infection control practices for students and HCWs.

Our research program has evolved from primarily investigations of access to care for patients with HIV to infection control, as we have recognized the importance of compliance with recommended infection control practices not only in minimizing cross-infection but as a positive influence on access to care for patients with bloodborne pathogens. After completing provincial and national studies of dentists, we are conducting a national survey of surgeons in Canada to investigate infection control and occupational health. We are accruing evidence that is particularly relevant for the design of interventions to improve compliance with current recommendations and that will contribute to the ongoing policy debate in Canada.

Improved compliance with recommended infection control practices is not only relevant but essential in times when there is an alarming increase in drug-resistant microorganisms.

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Is Filtered or Mineral Water Good for Us and Our Patients?

To the Editor:

Many consumers try to improve the quality of tap water by using household water filters, which typically are designed to filter out some toxic chemicals such as copper or lead, but not microorganisms. Therefore, many of the filter materials used in household filters are impregnated with silver to suppress bacterial growth. We tested the microbiological quality of filtered water in a commercial water filter system (BRITA) in households and in the laboratory. In 24 of 34 BRITA filters used in households, bacterial counts increased in the filtered water up to 6,000 colony-forming units (CFU)/mL. In 4 of 6 filters tested in the laboratory, bacterial counts in the filtrate after approximately 1 week of use were higher than in tap water; in some cases, colony counts in the filtered water were 10,000 times those in tap water.¹

The German Ministry of Health recently investigated six different household water filters sold on the German market. Up to 100 CFU/g *Aspergillus*, other fungi, or bacteria could be grown from new filter material. During 28 days of use, bacterial growth occurred in all filter materials; up to 100,000 CFU/mL could be isolated from filtered water. The most common organisms found were enterococci, *Aeromonas hydrophila*, *Acinetobacter* species, *Pseudomonas* species, and *Aspergillus*. Based on these results, the German State Institute for Consumer Protection and Veterinary Medicine strongly recommends not to use household water filters, or, if used, to boil the filtered water.

Is mineral water better? We investigated unopened bottles of the mineral water used in the oncology wards of the University Hospital, Freiburg, and found molds and non-fermenters in some of the bottles. We then tested 61 different so-called still waters (mineral water with low