

## **ACFD Guidelines on Infectious Diseases and Health Care Workers**

These Guidelines were developed and adopted by the ACFD to serve as a resource to assist ACFD Member Institutions in the development of their institutional policies.

Entry into the healthcare professions is a privilege that carries a responsibility to do no harm.

Direct patient care, including invasive procedures, is required during the educational programs of dental professionals (1-4). This places patients and healthcare workers (HCWs) at increased risk of transmission of infections including airborne diseases, and bloodborne pathogens (BBPs) – HIV/AIDS, hepatitis B virus (HBV) and hepatitis C virus (HCV) (5-7). Faculty and students should have the appropriate immunizations and the necessary training in infection control and Standard Precautions to minimize the potential for cross infection and the risk to patients, clinical students, faculty and staff (5-8).

Many HCWs including dental workers are reluctant to treat patients with BBPs - especially HIV/AIDS (9-13).

Faculties/Schools of Dentistry should clearly inform potential applicants through their Academic Calendars that during the course of their clinical education:

- a. students will be required to treat patients with infectious diseases (including HIV, HBV and HCV);
- b. applicants must fulfil requirements related to health status - including infection with HBV, HCV and HIV – and immunizations (see below).
- c. it is not possible to complete a DDS/DMD clinical program necessary for graduation without performing invasive / exposure-prone procedures.
- d. students and applicants with HIV-related health problems, hepatitis B or other infections may be unable to practice dentistry safely and competently.

HCWs including dentists and hygienists are at risk for exposure to blood-borne pathogens (7, 14, 15). Healthcare students are also vulnerable to exposures (16-20) especially those in dentistry (21, 22). There are vaccines to protect against HBV and other infections and a policy of mandatory immunizations and screening of HCWs and trainees protect patients, students and HCWs.

HCWs, including dental workers, who perform invasive procedures have an ethical obligation to know their own infectious disease status and to be medically assessed for risk of transmission of any infection (5). Despite this, less than 60% of HCWs report knowing that they are immune to HBV (23).

Acceptance into a DDS/DMD or clinical graduate program must be contingent upon completion of appropriate immunization and screening.

Policies for international and Canadian applicants should be the same.

**Recommended Immunization Guidelines** (6, 24-29):

Faculties or schools should have an immunization policy in place for students and student applicants. It is recommended that students seeking entrance into any healthcare programs provide the following information:

### **Diphtheria and tetanus**

Completion of a primary series of at least 3 doses of a combined tetanus, pertussis and diphtheria preparation and booster within the last 10 years is required.

### **Polio**

Completion of a primary series of at least 3 doses of oral polio vaccine or inactivated polio vaccine is required.

### **Measles**

Completion of two doses of measles vaccine or documented proof of disease (i.e. presence of measles IgG) is required as evidence of protection. Adults born after 1970 without a history of the disease require at least 1 dose of MMR (measles-mumps-rubella) vaccine.

### **Mumps**

Completion of at least one dose of mumps vaccine or documented proof of disease (i.e. presence of mumps IgG) is required. If non-immune, 1 dose of MMR vaccine is required.

### **Rubella**

Completion of at least one dose of rubella vaccine or documented proof of disease (i.e. presence of rubella IgG) is required. If non-immune, 1 dose of MMR vaccine is required.

### **Varicella**

Completion of 1 dose (before age 13) or 2 doses (if given after age 13) of varicella vaccine, or proof of the disease (i.e. history of varicella or presence of varicella zoster virus IgG) is required.

### **Tuberculosis (TB)**

Negative two step tuberculin skin test (TST) within the last 12 months is required. If there is a previously documented positive TST, previous treatment for active TB or treatment for latent TB, medical evaluation is needed to deem the person non-contagious.

### **Hepatitis B**

Completion of a HBV-containing (hepatitis B virus) vaccine series and documented seroconversion with antibodies to hepatitis B surface antigen (anti-HBs) is required. Testing should be done at least one month (but no later than six months) after the final immunization in the series. Lack of seroconversion requires revaccination and reassessment for immunity. If a healthcare worker never before tested is found not to have protective antibody, re-immunization with a full series of hepatitis B containing vaccine is indicated (26).

HBV immunization is not required if there is evidence of immunity due to prior infection (anti-HBs positive and/or antibodies to hepatitis B core antigen [anti HBc] positive).

## **Recommended Guidelines for Student and Student Applicants with Infectious Diseases**

### **Bloodborne Pathogens**

Compared with HCV or HIV, transmission of HBV is the greatest hazard in healthcare settings to those who are not immune (5, 30-32). The presence of HBeAg indicates a high risk of infectivity (5, 32-34). Among HCWs who sustained injuries from needles contaminated with blood containing HBV, the risk of developing clinical hepatitis if the blood was both HBsAg-positive and HBeAg-positive was 22%-31%. By comparison, the risk of developing clinical hepatitis from a needle contaminated with HBsAg-positive, HBeAg-negative blood was 1%-6% (32). Estimates of the risk of disease transmission after needlestick injuries contaminated with HCV or HIV are approximately 2% and 0.3% respectively (32, 35, 36). Healthcare workers, including students, who are infected with HCV, HIV, or HBV - with no evidence of HBe antigen or a high viral load ( $>10^3$  genome equivalents/mL) are considered low risk for transmission (5, 35, 37-45).

### **Hepatitis B**

Applicants who are HBsAg-positive and HBeAg-positive or who have a viral load greater than  $10^3$  genome equivalents/mL should **NOT** be accepted into clinical programs.

Applicants who are HBsAg-positive but HBeAg-negative can be accepted, but should receive counselling before beginning the clinical program  
Non-responders (non-immune) to the hepatitis B vaccine should be tested on a regular basis for the presence of HBeAg and viral DNA and be removed from direct patient care activities if found to be positive for HBeAg or if they exceed a viral load greater than  $10^3$  genome equivalents/mL.  
Current recommendations should be followed in the event of exposure to a non-responder (26).

### **Hepatitis C**

Applicants who are carriers of Hepatitis C can be accepted, but should receive counselling before beginning the clinical program

### **Human Immunodeficiency Virus (HIV)**

Applicants who are HIV positive can be accepted but should be counselled before admission to clinical programs. Students with risk factors for HIV should be counselled to seek HIV testing on a volunteer basis.

### **Communicable Disease Status**

Any student or student applicant with an infectious disease (6) has a moral and ethical obligation to inform the appropriate authority in their educational institution to receive appropriate counselling and recommendations. This is consistent with the Canadian Dental Association's Code of Ethics (46). In addition, there may be further specific reporting requirements in the various provincial jurisdictions (5).

HCWs exposed to HIV, HBV or HCV should be advised to follow current recommendations for postexposure prophylaxis (32).

### **References**

1. Accreditation requirements for Doctor of Dental Surgery (DDS) or Doctor of Dental Medicine (DMD) programs Effective April 1, 2001. Updated with Practice Outcomes Assessment- November 2001. Updated 30 November 2004. Commission on Dental Accreditation of Canada 2004: 15-16.
2. Accreditation requirements for Oral and Maxillofacial Surgery programs Effective November 30, 2003. Updated November 30 2004. Commission on Dental Accreditation of Canada 2004: 14-25.
3. Accreditation requirements for Prosthodontic programs Effective November 30, 2003. Updated November 30, 2004. Commission on Dental Accreditation of Canada 2004: 18-20.
4. Accreditation requirements for Dental Hygiene programs. Effective July, 2001. Updated with Practice Outcomes Assessment- November, 2001. Updated November 30, 2004. Commission on Dental Accreditation of Canada 2004: 16-18.
5. Health Canada. Proceedings of the Consensus Conference on Infected Health Care Worker Risk for transmission of bloodborne pathogens. Can Commun Dis Rep 1998;24 Suppl 4.
6. Health Canada. Prevention and control of occupational infections in health care. An infection control guideline. Canada Communicable Disease Report. Can Commun Dis Rep 2002;28 Suppl 1:1-264.
7. McCarthy G, Koval J, MacDonald J. Occupational injuries and exposures among Canadian dentists: the results of a national survey. Infect Control Hosp Epidemiol 1999;20:331-336.
8. McCarthy GM, Koval JJ, MacDonald JK. Compliance with recommended infection control procedures among Canadian dentists: results of a national survey. Am J Infect Control 1999;27:377-384.
9. Aragon C, McCarthy G, Stitt L. Access to dental hygiene services for patients with HIV in Canada In: Abstracts of the Ontario HIV Treatment Network Research Conference, 2005.

10. McCarthy G, Harris K, Stitt L. Access to elective surgery for patients with HIV or other bloodborne pathogens in Canada. In: Abstracts of the Ontario HIV Treatment Network Research Conference, November 24-25, 2005.
11. McCarthy G, John M, Stitt L, Driessen C. Attitudes of nurses related to the care of patients with HIV. In: Abstracts of the XVI International AIDS Conference, Toronto, Canada, August 13-18 2006.
12. McCarthy G, Mara T, Driessen C, Stitt L. Regional differences in access to dental hygiene services for those with HIV/AIDS in Canada. In: Abstracts of the XVI International AIDS Conference, Toronto, Canada, August 13-18 2006.
13. McCarthy G, Koval J, MacDonald J. Factors associated with refusal to treat HIV-infected patients: the results of a national survey of dentists in Canada. *Am J Public Health* 1999;89:541-545.
14. McCarthy G, Driessen C, John M, Harris K, Stitt L. Occupational exposures to HIV among healthcare workers in Canada. In: Abstracts of the XVI International AIDS Conference, Toronto, Canada, August 13-18, 2006.
15. McCarthy G, John M, Harris K, Stitt L. Occupational exposures to HBV and HCV among healthcare workers in Canada. In: Abstracts of the 12th International Symposium on Viral Hepatitis and Liver Disease, Paris, July 1-5 2006. *J Clin Virol*; Vol 36, Suppl 2, Abstr 129, S 479, 2006.
16. Kennedy J, JF H. Exposures to blood and body fluids among dental school-based dental health care workers. *J Dent Educ* 1999;63:464-469.
17. Health Canada. Division of HIV/AIDS Epidemiology and Surveillance. Updates on the National surveillance of occupational exposure to the human immunodeficiency virus (HIV) 2000;December:1-6.
18. McGeer A, Simor A, Low D. Epidemiology of needlestick injuries in house officers. *J Infect Dis* 1990;162:961-964.
19. Robillard P, Roy E. Blood and body fluid exposures among health care workers in acute care hospitals. In: Occupational health for health care workers: International Commission on Occupational Health, 1st update, 2nd International Congress. Hagberg, Germany: Ecomed; 1995. p. 158-165.
20. Yassi A, Khokhar J, Marceniuk M, et al. Hepatitis B vaccination for health care workers: evaluation of acceptance rate and program strategy at a large tertiary care hospital. *Can J Infect Control* 1993;8:94-97.
21. McCarthy GM, Britton JE. A Survey of Final-Year Dental, Medical and Nursing Students: Occupational Injuries and Infection Control. *J Can Dent Assoc* 2000;66:561.
22. McCarthy GM, Britton JE, John MA. Occupational injuries and infection control. *Acad Med* 1999;74:464-465.
23. McCarthy G, John M, Harris K, Stitt L, Mara T. HBV immunization, post-immunization serology and immunity among healthcare workers in Canada. In: Abstracts of the 12th International Symposium on Viral Hepatitis and Liver Disease, Paris, France July 1-5 2006. July 2006. *J Clin Virol*, Vol 36, Suppl. 2: S 98, abstract 124.
24. Health Canada. Guidelines for preventing the transmission of tuberculosis in Canadian health care facilities and other institutional settings. *Can Commun Dis Rep* 1996;22 Suppl 1.
25. Health Canada. Routine Practices and additional precautions for preventing the transmission of infection in health care. *Can Commun Dis Rep* 1999;25 Suppl 4.
26. Health Canada. Canadian Immunization Guide. 6th ed. Ottawa: Canadian Medical Association; 2002.
27. Patterson WB, Craven DE, Schwartz DA, Nardell EA, Kasmer J, Noble J. Occupational hazards to hospital personnel. *Ann Intern Med* 1985;102:658-680.
28. Sepkowitz KA. Occupationally acquired infections in health care workers. Part II. *Ann Intern Med* 1996;125:917-928.
29. Sepkowitz KA. Occupationally acquired infections in health care workers. Part I. *Ann Intern Med* 1996;125:826-834.
30. Bartlett J. Report from IDSA: symposium on healthcare worker issues. *Hopkins HIV Rep* 2000;12:3, 8.

31. Gerberding JL. Management of occupational exposures to blood-borne viruses. *N Engl J Med* 1995;332:444-451.
32. Updated US Public Health Service guidelines for management of occupational exposures to HBV, HCV and HIV and recommendations for postexposure prophylaxis, June 29, 2001. *MMWR Morb Mortal Wkly Rep*; 50(RR11):1-42.
33. Alter MJ, Mast EE. The epidemiology of viral hepatitis in the United States. *Gastroenterology clinics of North America* 1994;23:437-455.
34. Luu NS. Dental students with Hepatitis B: issues to be considered when defining policies. *J Dent Educ* 2004;68:306-315.
35. Gunson RN, Shouval D, Roggendorf M, Zaaier H, Nicholas H, Holzmann H, et al. Hepatitis B virus (HBV) and hepatitis C virus (HCV) infections in health care workers (HCWs): guidelines for prevention of transmission of HBV and HCV from HCW to patients. *J Clin Virol* 2003;27:213-230.
36. McCarthy GM, Ssali CS, Bednarsh H, Jorge J, Wangrangsimakul K, Page-Shafer K. Transmission of HIV in the dental clinic and elsewhere. *Oral Dis* 2002;8 Suppl 2:126-135.
37. Outbreak of hepatitis B associated with an oral surgeon-New Hampshire. *MMWR Morb Mortal Wkly Rep* 1987;36:132-133.
38. Chang v. University of Iowa School of Dentistry. U.S. Department of Health and Human Services Office of Civil Rights Docket #07923091 1995.
39. Ahtone J, Goodman RA. Hepatitis B and dental personnel: transmission to patients and prevention issues. *J Am Dent Assoc* 1983;106:219-222.
40. Goodwin D. An oral surgeon-related hepatitis B outbreak. *Calif Morbid* 1976;14.
41. Hadler SC, Sorley DL, Acree KH, Webster HM, Schable CA, Francis DP, et al. An outbreak of hepatitis B in a dental practice. *Ann Intern Med* 1981;95:133-138.
42. London Department of Health. Hepatitis B infected health workers. London; 2000.
43. McGaw T, Peters E, Holton D. Dental Students with Hepatitis B e Antigen: A Survey of Canadian Dental Schools. *J Can Dent Assoc* 2000;66:562-563.
44. Reingold AL, Kane MA, Murphy BL, Checko P, Francis DP, Maynard JE. Transmission of hepatitis B by an oral surgeon. *J Infect Dis* 1982;145:262-268.
45. Shaw FE, Jr., Barrett CL, Hamm R, Peare RB, Coleman PJ, Hadler SC, et al. Lethal outbreak of hepatitis B in a dental practice. *JAMA* 1986;255:3260-3264.
46. Canadian Dental Association. Code of Ethics, Article 2, Competency. [cited November 15, 2006]; 1991. Available from: [http://www.cda-adc.ca/en/cda/about\\_cda/code\\_of\\_ethics/index.asp](http://www.cda-adc.ca/en/cda/about_cda/code_of_ethics/index.asp).