



COLLEGE OF
PHYSICIANS AND
SURGEONS OF
ALBERTA

GUIDELINE

Hepatitis B Virus (HBV) Infection in Health Care Workers

CPSA Guideline

April 1994

This information is designed to aid practitioners in making decisions about appropriate care. This document does not define a standard of care nor should it be interpreted as legal advice. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

Preamble

The Council of the College of Physicians and Surgeons of Alberta established a committee of physicians and dentists to develop a policy on HBV-infected health care workers (HCWs)* for 1993. This statement will require at least annual review and possible revision as knowledge and recommendations may change. The Council strongly supports the Canadian Medical Association's view "that any policy development in this area should be based on scientific, epidemiologic and ethical principles, and its primary purpose should be to promote effective action in the control of infection, for the protection of the HCWs and the public, while at the same time safeguarding human rights." Although both HIV and HBV are blood-borne pathogens and although the underlying principles for the management of infected HCWs are similar, certain differences in the clinical and epidemiological patterns of infection make separate policies for HBV and HIV desirable. Notably, most individuals infected with HBV (in contrast to HIV) will recover completely and develop immunity to the agent, but a small number may have some potential for transmission to patients and a few will have a higher risk of liver carcinoma.

Background Information

1. A safe and highly effective vaccine for HBV immunization is available and has been recommended for all HCWs since 1982.
2. In the delivery of health care services, transmission of HBV from a HCW can occur only when infected blood or its components enters a patient through injury or mucocutaneous contact.
3. Rigorous routine attention to universal precautions and to established infection control practices offers very significant but incomplete protection against HBV transmission.
4. Transmission of HBV infection from HCW to patient, although well documented, is rare. Clusters of patients with HBV infection likely acquired from HBeAg-positive HCWs have been reported. A variety of types of HCW has been implicated in occupational transmission of HBV. Invasive contact** and consequent blood-to-blood exposure represent the probable means of transmission.

***HCW** - Registered member of any health care association recognized by independent legislation or by regulation under the Health Disciplines Act, the essential element being patient contact, direct or indirect, in any setting where that may occur. The content of this document is relevant to any health care provider who has patient contact, even if not subject to regulation.

****Invasive** - In this document, invasive contact and invasive procedure relate to surgical entry into tissues, cavities or organs or repair of major traumatic injuries: 1) in an operating or delivery room, emergency department or outpatient setting, including both physicians' and dentists' offices; 2) cardiac catheterization and angiographic procedures; 3) a vaginal or cesarean delivery or other invasive obstetric procedure during which bleeding may occur; or 4) the manipulation, cutting or removal of any oral or perioral tissues, including tooth structure during which bleeding occurs or the potential for bleeding exists. Simple injections, be they intramuscular, subcutaneous or intradermal, do not constitute invasive procedures in the context of this document. The Expert Review Panel will determine what, if any, restrictions on practice should be recommended to a particular HCW.

5. Percutaneous exposure to even microscopic amounts of HBeAg-positive blood has resulted in seroconversion in up to 30% of cases.
6. In a few instances, HCWs who continued to perform operative or other invasive procedures continued to transmit HBV to patients despite modification of technique.
7. No instance of transmission of HBV from HBsAg-positive, HBeAg-negative HCWs to patients has been published.
8. When HBV exposure is recognized, effective prophylaxis is available through the use of hepatitis B immune globulin (HBIG) and subsequent vaccination.
9. New therapies are increasingly available which may substantially lower the risk of HBV transmission from infected HCWs, indicated by clearance of HBeAg from their blood.

Committee Recommendations

1. HCWs should be immunized against HBV at the earliest possible date in their careers, preferably prior to clinical training. Until programs of universal HBV immunization in childhood have been implemented as recommended by the National Advisory Committee on Immunization and the Canadian Paediatric Society, student health and staff health programs must actively promote HBV vaccination and ensure that HCWs are immunized. Post-vaccination testing for Anti-HBs at 1 to 6 months may be considered in order to distinguish responders from non-responders and identify the need for post-exposure prophylaxis.
2. When acute HBV infection is recognized HCWs must refrain from invasive patient contact until the HCW is no longer HBsAg-positive.
3. All HCWs are encouraged to learn their HBV status if their practice involves invasive patient contact.
4. HCWs engaged in invasive procedures who know that they are HBsAg-positive should be tested for HBeAg.
5.
 - a) Restrictions concerning the practices of HBV-infected HCWs who do not carry out any invasive procedures are not justified, regardless of their HBeAg status.
 - b) Restrictions concerning the practices of HBsAg-positive, HBeAg-negative HCWs are not justified.
 - c) Restrictions concerning the practices of HBV-infected HCWs may be justified only when the HCW is HBeAg-positive and invasive procedures are part of that practice.

Note: Employers of health care providers who have direct patient contact are encouraged to develop policies related to recommendations 1, 3, and 4.

6. The College of Physicians and Surgeons of Alberta, the Alberta Dental Association, and other participating health care organizations should form a provincial expert review panel which would have a core group composed of at least a medical officer of health, an infectious diseases specialist and an infection control officer. Others will be members as required and will include the HCW's private physician and a HCW of the same discipline who is knowledgeable about the type of services provided by the infected HCW.

This panel will provide evaluation for HBV-infected, HBeAg-positive HCWs who carry out invasive procedures and counsel them on an individual and confidential basis concerning continued or modified professional practice and possible therapy which may alter infectivity. The panel will consider not only the health status of the HCW but also other factors including the specific services provided, matters of infection control practice and the HCW's skill and judgement. Location and type of practice may warrant consideration.

If the HCW is found to be an ongoing source of infection to others despite having implemented appropriate safety measures, that HCW shall be required to cease invasive procedures as required by the Communicable Diseases Regulation. This might require, despite otherwise maintaining confidentiality, reporting the matter to the Medical Officer of Health in order to ensure compliance.

7. Each professional organization and health care institution should, according to its own mandate, address issues of retraining and provision of compensation if the HCW makes a decision to withdraw from or alter professional activity after receiving the review panel's advice.
8. The potential ramifications of a HCW becoming HBV-infected through patient contact must not be used to justify denying service to anyone based only on the patient's HBV positivity.
9. The primary training and continuing education of all HCWs must include the principles of infection control techniques and universal precautions. These principles must be applied at all times.
10. Provision must be made for education and training of all HCWs in matters relating to HBV infection during all periods of learning -- pre- and post-qualification and continuing health care education.
11. Particular emphasis should be placed upon individualized career counselling for HBV-infected students. The fact of HBV infection alone must not be used to deny any individual entry to a health care profession faculty or school.

Concluding Comments

It is unrealistic to expect or to offer any absolute guarantee of safety. As in all aspects of health care delivery, this applies equally to the patient and to the HCW. Fatality due to HBV infection is rare.

This document has sought to produce a balanced statement which recognizes the interests and concerns of both the public and the health care professions with respect to HBV transmissibility during health care delivery.

Glossary of Laboratory Markers of Hepatitis B Virus (HBV) Infection

Hepatitis B surface antigen (HBsAg): The outer coat protein of HBV, produced in vast amounts by liver cells during infection. Only a small portion of HBsAg combines with viral core products to form complete, infectious HBV particles. Most of the excess HBsAg is released into the bloodstream as non-infectious spherical and tubular particles; however, a person whose serum tests positive for HBsAg must be considered infectious to others.

Hepatitis B core antigen (HBcAg): This material forms the inner core of HBV particles and is produced by liver cells during viral multiplication. It is not found free in the bloodstream at any time and is therefore not a useful serologic marker of HBV infection.

Hepatitis B e antigen (HBeAg): This antigen forms as a result of processing of HBcAg in infected liver cells. Presence of HBeAg in blood correlates with active production of infectious HBV particles and is an indicator of greater risk of transmission under conditions of exposure.

Each of the above viral proteins induces a corresponding antibody response that is detectable in the serum or plasma:

Antibody to hepatitis B surface antigen (anti-HBs)

Antibody to hepatitis B core antigen (anti-HBc)

Antibody to hepatitis B e antigen (anti-HBe)

Timing and Sequence of detectability of HBV Serologic Markers

HBsAg is the first marker to appear in the blood after HBV begins to multiply in a susceptible person. Laboratory tests are usually positive by four weeks after exposure to HBV, with a range from one to twelve weeks. Detection of HBsAg precedes the onset of clinical symptoms or jaundice and elevation of liver enzymes; it signals infectivity of the person. HBsAg usually persists for four to fourteen weeks.

HBeAg appears in the blood very shortly after HBsAg and disappears before HBsAg becomes undetectable. The presence of HBeAg indicates that a person is highly infectious. Disappearance of HBeAg following acute HBV infection is an indicator of decreasing virus reproduction.

Anti-HBc is the first antibody to appear in the blood. It is generally detectable as HBsAg and HBeAg reach peak levels and with the onset of signs and symptoms of clinical HBV infection. Early anti-HBc is of the IgM class of antibody (anti-HBc IgM) and remains detectable in the blood for several weeks.

Persistent anti-HBc is of the IgG class of antibody (anti-HBc IgG) and it usually remains detectable in the blood for many years. It is present in persons with chronic HBV infection (marked by persistence of HBsAg for more than six months) and in those who have completely recovered from HBV infection.

Anti-HBe appears as HBeAg disappears and usually persists for one or more years after resolution of HBV infection. Seroconversion to anti-HBe generally represents a reduction in infectivity.

Anti-HBs is the last antibody to appear and is usually detectable two to six weeks after clearance of HBsAg. It usually remains positive for many years after HBV infection. The presence of anti-HBs indicates clinical recovery and development of immunity to HBV and suggests that the person is no longer infectious.

Chronic HBV infection is defined as persistence of HBsAg for longer than six months. This failure to clear HBsAg from the blood occurs in about 5 to 10 percent of adults following HBV infection and in up to 90 percent of infants infected in the first year of life. The chronic carrier is usually also positive for either HBeAg, indicating a highly infectious state, or for anti-HBe, usually denoting a much reduced state of infectiousness. Anti-HBc IgG is present in carriers while anti-HBs is usually not detectable (although it may be present in antigen-antibody complexes bound to HBsAg).

In most cases HBsAg, Anti-HBs and Anti-HBc IgM or Anti-HBc IgG are the only tests of value for assessing a patient. Other serologic tests (eg.: HBeAg or anti-HBe) may be useful in assessing HCWs but should only be ordered on the recommendation of a specialist in the field.

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Appendix

Several points about the expert review panel require expansion and clarification.

Its purpose will be to give expert advice to infected HCWs in order to minimize concern for possible transmission of HBV infection to patients and, if necessary, to review matters again after a period of time has passed or if the HCW's health status should change. This might lead to different advice than was originally given. Monitoring and supervision of the HCW's activities, professional or personal, would not be the panel's responsibility. Each case will require evaluation on an individual basis considering all unique circumstances which will exist.

If the HCW were found to be putting patients at risk through ignoring reasonable advice, confidentiality could no longer be maintained; the HCW would have to be reported to his/her own licensing body by the attending physician, by the employer, or by the review panel.

The review panel's composition as described in Recommendation #6 is not meant to preclude possible membership by a lay person. Participation, on a case by case basis, of an expert from the same health care discipline as the infected HCW is essential and must always be made available.

While the HCW will usually, with or without the assistance of an attending physician, present his/her own case to the review panel, there may be instances where the HCW will choose to have the facts presented anonymously by proxy, probably by the physician as advocate.

Initial access to the panel may be by telephone, by personal contact or proxy, or in writing. The Registrar/Chief Executive Officer of the HCW's professional organization should be the point of anonymous initial contact for referral to the panel. The appropriate name, address and telephone number of that contact person should be advertised to all members of that professional association.

Expenses for the panel's activities with respect to an individual infected HCW should be the responsibility of the relevant professional organization, eg: Alberta Dental Association for dentist, College of Physicians and Surgeons of Alberta for physician and osteopath, etc.