EDUCATION 2008

Philosophy on Education

There are five fundamental principles that form the backbone of CHICA-Canada's philosophy on education. These are:

- The need for learning is life-long;
- Geographic location should not be a barrier to learning;
- Life experience is a wonderful teacher and we need to build on and use that experience and expertise of CHICA-Canada members;
- Life experience alone is insufficient for development of expertise without, at minimum, reflection; and
- Individuals have a responsibility for identifying learning needs and learning options.

Educational opportunities need to be made available to all practitioners, regardless of their geographic setting, level of experience, desire for academic credit or ability to attend the Annual National Conference. CHICA-Canada therefore attempts to facilitate (though not necessarily provide) and identify a variety of learning opportunities, via a number of modalities (e.g., web, journal, in-person) and directed to a wide variety of learning needs. Since individuals may not always be able to identify their own learning needs or how they can be met, our efforts include providing such direction. Furthermore, Chapters facilitate interaction between members and other experts so individuals can learn from each other, as well as collaborate in problem solving and developing evidence-based programs and policies. CHICA-Canada can help create and strengthen the infrastructure for education and communication, so as to strengthen the practice of infection prevention and control in all parts of the country.

Identifying Learning Needs

Individuals come with different knowledge, skills, experiences, learning styles, learning needs and learning opportunities. All practitioners need a basic set of knowledge and skills, but other requirements will depend on individual practice and settings. Some Infection Prevention and Control Professionals (ICPs), for example, work with many other individuals and specialize in certain content areas or functions (e.g., surveillance or data management). Other ICPs work alone or with few others and thus need to be able to perform a wider variety of functions and be more of a "generalist". Novice ICPs need to learn a lot in a short time to fulfill their roles, whereas more experienced ICPs can focus on developing a single aspect at a time.

Individuals can and should do a self-assessment and identify the knowledge and skills they need to obtain or strengthen. Such self-assessment might be done formally (e.g., as part of a performance appraisal) or informally. Areas for development might be specific to infection prevention and control, or may be more generic, such as improving written or verbal communication, ability to work in a team, or finding and appraising research evidence.

Identification of knowledge and skill sets to be developed can be made by reviewing professional and practice standards that have been developed by CHICA and SHEA (see Appendix A) or from the competencies identified by other groups. The CHICA/SHEA standards relate to 9 content areas: 1) infection prevention and control practice, 2) epidemiology, 3) surveillance, 4) education, 5) consultation, 6) performance improvement, 7) program management and evaluation, 8) fiscal responsibility and 9) research.

Each standard or competency includes key criteria that can be used to guide identification of learning needs. Discussion with managers and colleagues can also help identify areas for development, or priority areas. The Infection Prevention Society of the UK recommends focusing on areas identified as Refining or Developing, as described below:

- Expert: A skill or practice you feel you excel in;
- Highly Developed: A skill or practice you feel you are good at;
- Refining: A skill or practice you feel you could improve;
- Developing: A skill or practice you do not currently use or have but which could be included or useful in your role;
- Not Applicable: A skill or practice that you determine could not be part of your role.

Setting and Evaluating Learning Goals

Novice ICPs need to learn about multiple topics at once, at enough depth to function but not enough depth to be considered an expert. In comparison, more experienced ICPs are able to identify only a few areas (1-3) to strengthen at a given time. Setting learning goals will provide an overall direction for learning. Goals should be concrete enough to guide behaviour/knowledge changes and may be either short-term or long-term in nature (or both).

Identifying success indicators when setting goals will help individuals assess their progress. A success indicator specifies the evidence that demonstrates the learning objectives have been met. For example, success indicators for the goal of learning basic statistics might include being able to apply it to one's own data without having to look up information or consult others, and being able to clearly explain one's results.

Target dates should be included when setting goals. They may be directed by the learning options identified for meeting goals (e.g., by when a workshop is or a course's deadlines), by external deadlines (e.g., needing to be prepared for a certain meeting), or by one's own schedule. Target dates should be realistic, and balance obligations in one's work and life. Setting multiple target dates for different milestones is helpful for assessing progress and continuing motivation.

Progress toward meeting learning goals should be evaluated on a regular basis. The learning plan and target dates may need to be refined; less commonly, learning goals may need to be reset. Putting one's professional development plan in writing can help track progress. Table 1 shows an example of a professional development plan.

Finding Resources to Meet Learning Needs

No single program will meet every learning need of every ICP. A number of learning options are available, however, that ICPs can select from to meet their individual needs and interests. Learning can be informal, acquired by reading journals and textbooks and interacting with others through networks and CHICA Chapters. Learning can also be more formal, through continuing education options that range from very short (e.g., one hour in-services) to longer conferences and workshops (1-3 days), to courses provided by colleges and universities, to programs consisting of several courses and other requirements (e.g., projects) which lead to relevant certificates or degrees.

A few Basic Infection Control courses are available for novice ICPs, who have

a lot to learn in a short period of time. Table 2 lists current courses; interested individuals should contact the site offering the course for more details.

The CHICA-Canada National Conference is held annually, and offers a number of sessions on a wide variety of topics so that ICPs can learn from experts in the field, and share knowledge and experience with each other. Details about the conference can be found on the CHICA website. The CHICA website also lists other continuing education sessions that are available across Canada. ICPs should note, however, that listing of the sessions does not mean they are endorsed by CHICA, as it is not possible for CHICA to review the content and delivery of all sessions. Provincial networks similarly provide information about available education. Individuals need to judge for themselves the validity and reliability of the information, the credibility of the session leaders, the quality of delivery, and the usefulness of the session for meeting their own learning goals.

ICPs interested in academic work can identify learning options by reviewing university websites for specific courses that might be of interest. At present, for example, the University of British Columbia offers a number of courses that lead to a certificate in infection control, while the University of Calgary offers a master's degree with a specialization in hospital epidemiology. Other universities offer a variety of courses, including fundamental epidemiology, statistics, research design and microbiology. Requirements vary by university and should be discussed with the appropriate department.

When choosing a learning option, whether a short session or a course or a program, individuals should first be sure of what they are looking for in a course and assess:

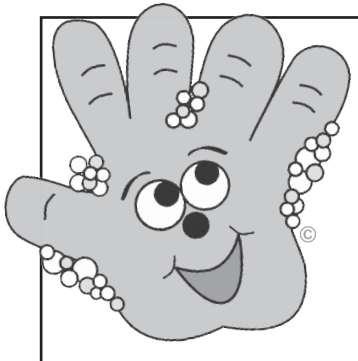
- If it provides the knowledge and skills required or expected;
- What the time commitment is and if that is reasonable given their other commitments to work and family;
- How the course will be evaluated, and if at least some of the evaluation methods will be helpful in their work (e.g., developing the knowledge base required for certification, or developing/revising a program or tools one can use locally);
- Costs and affordability;
- Ease of access;
- If university credit is available should they wish to apply a course to a degree or certificate program.

Responsibility for Education at CHICA-Canada

Within CHICA-Canada, there are a number of key individuals with responsibilities related to education:

1. The Director of Education, elected by the membership, holds a three-year term on the CHICA-Canada Board of Directors. The Director of Education identifies the educational needs of the membership, and oversees the implementation of CHICA-Canada courses.
2. The Distance Education Coordinator is responsible for managing delivery of the CHICA-Canada Basic Infection Control course. The Distance Education Coordinator reports to the Board of Directors through the CHICA-Canada Director of Education.
3. The Scientific Program Committee is a nationally appointed committee comprised of representatives from acute care, long-term care, community, public health, occupational health and infectious diseases. Committee members are responsible for the planning of annual conference education programs and long-term strategies for professional education. The Scientific Program Committee Chair reports to the Board of Directors through the CHICA-Canada Director of Education.

Most important of all are CHICA members! They share responsibility for identifying their own learning needs, finding opportunities to meet those learning needs, and helping each other by sharing questions, knowledge and experience. Together, we will continue to strengthen infection prevention and control through education, research and practice.



"Consistent, thorough hand hygiene is the cornerstone of preventing the spread of infection."

Sudsy Making a Statement for Handwashing

CHICA - Canada's official Handwashing Statement is as follows:

Consistent, thorough hand hygiene is the cornerstone of preventing the spread of infection. Hand hygiene decreases the number of disease-causing organisms on the surface of your skin, and can be achieved by either traditional handwashing, or by rubbing a waterless antiseptic product on hands. To be effective, hand hygiene should be performed:

- before and after contact with patients, their body substances or items contaminated by them;
- between different procedures on the same patient;
- after removing gloves;
- before and after performing invasive procedures;
- after performing personal functions such as blowing your nose or using the toilet;
- before eating, preparing or serving food, feeding a patient; and
- when hands are visibly soiled.

To wash your hands, use warm, running water, soap, friction for at least 15 seconds and to dry your hands use a clean towel or paper towels. Turn off the taps with a paper towel to avoid recontaminating your hands. Waterless antiseptic hand hygiene products are an excellent alternative to soap and water and may be used if hands are not visibly soiled. Hand lotions or creams should be available to minimize any skin irritation or breakdown caused by hand hygiene. These lotions or creams should not interfere with the persistent antimicrobial effect of the hand hygiene agent being used. Proper hand hygiene should be an individual and an institutional priority. As Infection Control Professionals, it is our responsibility to teach and promote good hand hygiene.

Table 1: Example of a Professional Development Plan

Goal: Learn basic statistics (p values, confidence intervals, risk stratification, comparing rates by group and over time) and apply it to my own data.

Success Indicators: 1) able to apply with my own data without looking it up, 2) mentor agrees with my analysis and conclusions, and 3) able to explain my infection results to the director of the program.

Learning Activities and due dates	Activity and Date done	Evaluation	Material to support accomplishment
Week 1: Ask XX to mentor me and set plan.	Done by end of week 1.	She agreed and we set a plan with some appointments.	Plan and timeline, key points of who does what.
Weeks 2-4: Get basic stats book and read key chapters.	Read half of chapters by week 3, rest by week 4.	Met with mentor twice to discuss concepts. Found practice problems in text helpful. Concepts are clear now, ready to try with my own data.	Notes taken, have key points written as a summary to help me remember.
Week 5: Practice calculating rates by group and month, with CI, on one database and check with mentor.	Had to learn how to do this with my database—needed to reorganize it a bit so needed an extra week. By end of week 6, had rates and interpretation ok	Met with mentor to figure out commands for the analysis. Needed practice with phrasing and how to explain but had the numbers and ideas correct. We discussed how to report it.	Key points written as a summary to help me remember how to do it.
Weeks 6-7: Develop report and discuss with program director.	Report given to director at end of week 7. We then met a few days later to discuss it.	She had only a few questions that I was able to answer; I will revise the report so the points raised are clearer.	Initial report and feedback from director; final report.
Week 8: Repeat with a second database.	Done.	It was much easier; now have a model to use for future analysis/reports.	Second report.

Table 2: Basic Infection Control Courses available in Canada

Program/Location	Where to get more information	Route Offered
CHICA-Canada* Basic Infection Control: Site where offered will vary	Contact CHICA's Distance Education Coordinator for information. See the CHICA website: http://www.chica.org/educ_education.html	On line
Centennial College, Toronto	http://www.centennialcollege.ca	On line or 10 day classroom
Queen's University, Kingston	http://meds.queensu.ca/cpd/che/online_courses/infection_control	90 hours on line

*Note: at present CHICA is refining its endorsement policies and procedures such that endorsement means that the content, delivery and evaluation methods have been reviewed by an Advisory Board and found to be suitable for novice ICPs. Websites will be updated as courses go through the process.

Virox Technologies Inc. Member
Scholarship Fund

VIROX TECHNOLOGIES PARTNERS 2008 – SCHOLARSHIP WINNERS ANNOUNCED

Through the financial support of the Virox Technologies Partnerships, 10 CHICA-Canada members were awarded scholarships to attend the 2008 CHICA/AIPI 2008 Education Conference in Montreal. CHICA-Canada and its members thank Virox Technologies and their partners Deb Canada, JohnsonDiversey, Steris Corporation, Virox Technologies, and Webber Training for their initiative to make the national education conference accessible to those who may not have otherwise have been able to attend.

LIST OF PARTNERS:

JohnsonDiversey Clean is just the beginning

deb Deb Canada

Webber Training TELECLASS EDUCATION for HEALTHCARE PROFESSIONALS

STERIS

VIROX TECHNOLOGIES INC.

For information on the Virox Scholarship and the application form, see *www.chica.org* (Opportunities).

3M CANADA INFECTION PREVENTION RESEARCH GRANT

As part of an ongoing initiative to promote innovative infection control and prevention practices in Canadian Health Care, 3M Canada has created a research grant through their Infection Prevention Platform. The research grant is targeted to individual members of the Community and Hospital Infection Control Association – Canada (CHICA–Canada) for use in research studies. The research grant will be a one-time payment offered on an annual basis.

For information, see *www.chica.org* (Opportunities)

CHICA-CANADA POSITION STATEMENTS

ANTIBACTERIAL PRODUCTS IN THE COMMUNITY

Public concern about the emergence of antibiotic resistant organisms (AROs) has created a perceived need for new household products and devices (e.g. toys, hand soaps, towels, animal care products, etc.) that incorporate antibacterial agents. There is little evidence to suggest that these agents reduce infections in the home. Antibacterial agents alter the mix of naturally occurring bacteria, killing susceptible organisms and potentially leaving the resistant ones to survive and multiply. Furthermore, the incorporation of low levels of antibacterial agents, which do not kill the organisms, may promote the development of resistant genes.

Apart from the environmental concerns, most of these new products are expensive and play on the public's fears of contracting an infectious disease from an antibiotic resistant organism. In fact, the most common household illnesses are viral in nature, to which antibacterial agents are ineffective. The focus should continue to be on frequent handwashing, safe food preparation, good personal hygiene, and basic home cleanliness.

HAND HYGIENE

Consistent, thorough hand hygiene is the cornerstone of preventing the spread of infection. Hand hygiene decreases the number of disease-causing organisms on the surface of your skin, and can be achieved by either traditional handwashing, or by rubbing a waterless antiseptic product on the hands. To be effective, hand hygiene should be performed:

- before and after contact with patients, their body substances or items contaminated by them
- between different procedures on the same patient
- after removing gloves
- before and after performing invasive procedures
- after performing personal functions such as blowing your nose or using the toilet
- before eating, preparing or serving food, feeding a patient and when hands are visibly soiled.

To wash your hands, use warm, running water, soap, friction for at least 15 seconds and to dry your hands use a clean towel or paper towels. Turn off the taps with a paper towel to avoid recontaminating your hands. Waterless antiseptic hand hygiene products are an excellent alternative to soap and water and may be used if hands are not visibly soiled. Hand lotions or creams should be avilable to minimize any skin irritation or breakdown caused by hand hygiene. These lotions or creams should not interfere with the persistent antimicrobial effect of the hand hygiene agent being used. Proper hand hygiene should be an individual and an institutional priority. As Infection Control Professionals, it is our responsibility to teach and promote good hand hygiene.

References
1. Guideline for Hand Hygiene in Health-Care Settings, Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Centers for Disease Control and Prevention 2002
2. Hand Washing, Cleaning Disinfection and Sterilization in Health Care. Health Canada, 1998

PERIOPERATIVE ANTIBIOTIC PROPHYLAXIS FOR THE PREVENTION OF SURGICAL SITE INFECTION

Perioperative antibiotic prophylaxis has been demonstrated to prevent surgical site infections in designated clean and clean-contaminated procedures. To be effective, the following must be considered:

Antimicrobial Prophylaxis (AMP) should be used for all clean contaminated procedures, and for certain clean procedures in which clinical trials have proven their use will reduce surgical site infection (SSI) rates.

The agent used for AMP should be safe, inexpensive and bactericidal with an in vitro spectrum that covers the most probable intraoperative contaminants for the operation.

The infusion of the initial dose of antimicrobial agent must be timed so that a bactericidal concentration of the drug is established in serum & tissues by the time the skin is incised. Ideally the administration of prophylactic antibiotics should be completed within 30 minutes and no more than 1 hour before the time of incision.

Therapeutic levels of the AMP should be maintained in both serum & tissues throughout the operation and until at most a few hours after the incision

is closed. This may necessitate an antibiotic "top-up" intra-operatively at intervals of one to two times the half life of the drug. In most cases, AMP antibiotics should not be given beyond the operative period.

References
1. Mangram AJ, Horan TC, Pearsoon ML et al. Guideline for prevention of surgical site infection, 1999. Hospital Infection Control Practices Advisory Committee. Infect Control Hosp Epidemiol 1999;20: 25-278.
2. American Society of Health-System Pharmacists. ASHP therapeutic guidelines on antimicrobial prophylaxis in surgery. Am J Health Syst 1999; 56:1839–88.
3. Dellinger EP, Gross PA,Barrett TL et al. Quality standards for antimicrobial prophylaxis in surgical procedures. Clin Infect Dis 1994; 18: 422-7.

MEDICAL GELS

Medical gels are used routinely in clinical practice. Despite the fact that nosocomial infections have been associated with contamination of these products, there is no comprehensive scientifically based evidence for the optimal use of medical gels. Until such time as that information becomes available, CHICA-Canada makes the following recommendations in an effort to ensure the safe use of these products:

I) STORAGE:
- Products must be stored in areas that are dry and protected from potential sources of contamination such as dust, moisture, insects, rodents, etc.
- If evidence of contamination is present or package integrity has been breached, the product must be discarded.
- Products should be rotated when restocking takes place.

II) INDICATIONS FOR PARTICULAR GELS

		Type of Gel	
Indication	**Sterile**	**Bacteriostatic**	**Non-sterile**
Procedure penetrating mucous membrane	✓		
Endoscopies on intact mucous membranes	✓	✓	
Non-endoscopic procedure on mucous membranes (eg: vaginal/rectal exam)	✓	✓	
Non-intact skin	✓		
Babies in NICUs	✓		✓

II) GENERAL CONSIDERATIONS
- Single use containers are required for sterile products, as an opened sterile gel package is no longer sterile
- Sterile product must be used employing the principles of asepsis.
- Containers/dispensing nozzles must not come in direct contact with a client, staff, instrumentation, or the environment. If this occurs, the remainder of the contents must be discarded upon completion of the procedure.
- Refilling bottles
  - Non-sterile gel containers must never be topped up (ie: refilled when partially empty).
  - If reusable containers are used for non-sterile product, the containers must be washed in an instrument washer or in hot, soapy water in a clean, separate basin (eg: dishpan), rinsed and dried thoroughly prior to refilling. Any residual gel on the outside of the container must also be thoroughly washed off.
  - When a new bottle or newly refilled bottle is opened, the bottle should be dated and discarded after 1 month.
  - When filling a reusable container, ensure that the large bulk container has not passed the expiration date.
  - Maintain aseptic technique during the refilling process.
- Warming of Gel
  - Warmed gel should be used only when required.
  - Bottles should be removed from the warmer as soon as possible and dried immediately.
  - Gel warmers must be cleaned according to manufacturer's instructions using an approved hospital disinfectant at least weekly and when visibly soiled.
- Use of bulk containers of gel
  - The use of bulk containers of gel should be discouraged. If they must be used, the dispensing device must be used and the product discarded by the expiry date.
  - The gel dispensed from the bulk container must be placed in a thoroughly clean, dry and empty container. The container should be dated with the date of fill and the date to discard.
  - No topping up should take place.
  - Gel dispensed from a bulk container must be discarded within one month.

References
1. Gaillot, O., Maruéjouls, C., Abachin, E., Lecuru, F., Arlet, G., Simonet, M., & Berche, P. (1998). Nosocomial outbreak of Klebsiella pneumoniae producing SHV-5 extended-spectrum-ß-lactamase, originating from a contaminated ultrasonography coupling gel. Journal of Clinical Microbiology, 36(5), 1357-1360.
2. Weist, K., Wendt, C., Petersen, L.R., Versmold, H., & Rüden, H. (2000). An outbreak of pyodermas among neonates caused by ultrasound gel contaminated with methicillin-susceptible Staphylococcus aureus. Infection Control and Hospital Epidemiology, 21(12), 761-764.
3. Mayhall, G (Ed.). (1999). Hospital Epidemiology and Infection Control (2nd ed.). Philadelphia: Lippincott Williams & Wilkins.
4. Laboratory Center for Disease Control. (December 1998). Hand Washing, Cleaning, Disinfection and Sterilization in Health Care. Canada Communicable Disease Report, 24(S8).
5. Association for Professionals in Infection Control and Epidemiology, Inc. (2000). APIC text of infection control and epidemiology. Washington, DC: Author.
6. Health Canada. Health Products and Food Branch. Notice to Hospitals: Important safety information on ultrasound and medical gels. December 14, 2004.

HANDLING OF EXPRESSED BREAST MILK (EBM) IN ACUTE CARE FACILITIES

Breast milk is an important source of nutrition and immunological protection for an infant. Since breast milk is a body fluid, many aspects of handling in hospital are guided by practices used for other body fluids, e.g. blood, blood transfusions. Breast milk can also be a source of infection. To minimize the risk of spreading infection in acute care facilities the principles for safe handling of expressed breast milk (EBM) listed below should be followed. Please note, each facility needs to adapt these practice statements based on what makes sense in their own facility with the resources they have.

1. The mother should be taught the basic principles of asepsis as it applies to collection, storage and handling of breast milk.
2. EBM must be collected in an aseptic container (single use sterile bottles and sterile lids should be used for every pumping session) and labeled to include contents, baby's name, mother's name, hospital identifier, date/time of pumping, date/time of freezing, and date/time of thawing.
3. Freshly expressed breast milk should be used within 48 hours or otherwise frozen in a dedicated freezer. Unrefrigerated fresh breast milk should be used within four hours or discarded.
4. Each mother should be assigned a dedicated labeled freezer container for her baby's milk.
5. Frozen breast milk should be thawed in the refrigerator and used within 24 hours. Use of multi-bottle water baths should be discouraged; however if they are used care should be taken to protect the bottles from direct contact with the water to avoid contamination.
6. EBM that has been fortified must be used within 24 hours of preparation. Details should be reviewed with the hospital formula room and/or dietitian.
7. When administering EBM, principles of Routine Practices should be followed.
8. At a minimum a double check mechanism should be used at the time of administration to avoid errors in administration. In facilities with large numbers of mothers who express milk, long term consideration should be given to automated systems such as bar coding to avoid errors in administration.
9. A comprehensive written policy including disclosure and course of action should be available in the event of errors involving breast milk. Viral testing of "donor" and "recipient" mothers should occur as well as administration of post exposure prophylaxis if indicated.
10. The maximum hang time for continuous feedings is four hours. The administration set should be changed every four hours.
11. Because of the higher risk of environmental contamination and the potential for cross-contamination in the hospital environment , breast pump kits should be reprocessed after each use by a minimum of high level disinfection.
12. Breast pump tubing and membrane filters can be difficult to clean adequately depending on the make of pump and facility reprocessing expertise. In general, they should be discarded if they come in contact with breast milk.
13. The breast pump should be cleaned with a low level disinfectant after each use.
14. Banked human milk is available by prescription and can be considered in selected circumstances from a reputable donor human milk bank where adherence to rigorous guidelines (e.g. Human Milk Banking Association of North America) occurs.

References
1. Red Book; 2003 Report of the Committee on Infectious Diseases. 26th edition, 118-120.
2. Barry, C. et al. (Spring, 1998) Management of EBM: Is the right breast milk being fed to infants? Can. J of Infection Control. 16-19.
3. Ogundele, M. (2002). Techniques for the storage of human breast milk: Implications for anti-microbial functions and safety of stored milk. European Journal of Pediatrics, 159, 793-797.
4. Canadian Pediatric Society, (1995). Human milk banking and storage N9503, 1-5.
5. Pediatric Nutrition Practice Group of the American Dietetic Association (2003). Infant Feedings: Guidelines for preparation of formula and breast milk in health care facilities.
6. Mead Johnson (2002). Letter to Health Care Professional. August 9, 2004.
7. APIC Text of Infection Control and Epidemiology, 38;18-19. Revised Ed. Jan. 2005.
8. Health Canada. Hand Washing, Cleaning, Disinfection and Sterilization in Health Care. Dec. 1998.
9. Doxtator L, Zoutman D. (Summer 2006) Management of breast pump kits: a review. Can J Infection Control, 92-95.
10. www.hmbana.org

INFECTION PREVENTION AND CONTROL MEASURES TO PREVENT TRANSMISSION OF HEPATITIS B AMONG HEMODIALYSIS PATIENTS

Hemodialysis patients are at high risk for acquiring blood borne infections. The dialysis treatment requires large volumes of blood to be processed outside of the body. Contact either directly or indirectly with the contaminated environment, equipment or hands of healthcare workers may result in transmission of blood borne pathogens (1).

Hepatitis B virus (HBV) is spread by percutaneous or permucosal exposure to blood or body fluids that contain HBV. HBV is relatively stable in the environment and remains viable for at least 7 days on environmental surfaces (1, 5).

To prevent the transmission of the Hepatitis B Virus (HBV) hemodialysis programs should institute a comprehensive Hepatitis B Virus (HBV) prevention plan (1, 4), including the recommendations provided below. The following recommendations address the prevention and management of Hepatitis B infection in hemodialysis patients. Other bloodborne pathogens (such as Hepatitis C or HIV) do not require isolation or other additional measures outlined below; these patients are effectively managed through the implementation of Routine Practices (1, 2, 3, 4).

CHICA-CANADA supports implementation of the following recommendations to help prevent and manage HBV infections in patients receiving hemodialysis.

1. **Immunization:** The risk of transmission of HBV is reduced by immunization against hepatitis B (2).

   Test all vaccinees for anti-HBs 1–2 months after the last primary vaccine dose, to determine their response to the vaccine (adequate response is defined as >10 mIU/mL) (2, 4, 5). Patients and staff members who do

not respond to the primary vaccine series should be revaccinated with three additional doses and retested for response (1, 2, 4). No additional doses of vaccine are warranted for those who do not respond to the second series (2, 4). In this case, follow recommendations for patients considered susceptible.

Patients: Hepatitis B vaccination is recommended early in the course of kidney disease for all susceptible patients. Beyond hemodialysis, this includes pre-dialysis and peritoneal dialysis patients. Kidney failure interferes with the body's natural immunity and chronic dialysis patients who become infected may become chronic carriers of the disease.

Hemodialysis programs should have policies and procedures in place regarding revaccination and follow-up of immune status (1, 2, 4).

Staff: HBV immunization of healthcare workers began in Canada in 1982 and is recommended for those persons at increased risk of occupational infection, (i.e., those exposed to blood, blood products, and bodily fluids that may contain the virus) (2, 4, 5). Hemodialysis programs should have a policy and procedures to monitor HCW HBV immunization.

2. Containment and Management:

- Consistent use of Routine Practices for the care of all hemodialysis patients (3)
- Hand hygiene reduces the number of microorganisms on the hands, and is the most important practice to prevent the spread of infection to patients and staff (2, 3, 5)
- Personal Protective Equipment- single use (2, 3, 5)
  - Gloves for direct patient care or when touching the patient's equipment
  - Mask, eye protection, and face shield to protect the mucous membranes of the eyes, nose and mouth when performing procedures that may generate splashes or sprays of blood or body fluids
  - Gown to prevent soiling of clothing or unprotected skin
- Standard facility- based environmental cleaning policies should be in place to reduce opportunities for transmission of infectious agents (2, 3, 5)

Additional Infection Prevention and Control Practices for HBsAg- Positive Patients:

Contact transmission is the most important route by which pathogens are transmitted in healthcare settings (3)

- Dialyze HBsAg-positive patients in a separate room with dedicated machine, equipment, medications and supplies (1, 2, 4)
- If a separate room is not available, a separate area may be used in order to geographically separate HBV-positive patients from HBV-susceptible patients (1, 2, 4)
- Healthcare workers should not care for HBV-positive patients at the same time as HBV-susceptible (1, 4)
- HBV-immune patients may act as a geographical buffer between positive and susceptible patients (1, 4);
- Staff members can be assigned to care for both HBV-positive and HBV-immune patients on the same shift. There must be current serology to confirm the patient's HBV immunity prior to assigning the two groups together. Protection against HBV is not maintained if the patient's Anti-HBs drops below protective levels of 10 mIU/ml (1, 4)
- Internal pathways and external surfaces of the dialysis machine used on a HBV-positive patient must be cleaned and disinfected with a high-level disinfectant prior to use on another patient (1, 4)
- Post dialysis treatment, clean all surfaces in the dialysis station with a facility-approved disinfectant, including the bed/chair, table, television remote, and machine (1, 4)

3. Screening:

- Serologic testing of all chronic kidney disease patients should occur prior to admission to the program or the first dialysis treatment (hemodialysis or peritoneal dialysis). This should include HBsAg, Anti-HBs, Anti-HBc, and Hepatitis C screening (Anti HCV, ALT) (4)
- If the patient's HBV status is unknown at the time of first treatment the dialysis machine must not be used on another patient until the internal pathway and external surfaces have been cleaned and disinfected (4)
- A method should be developed to monitor, review and evaluate all serological testing for HBV (1, 4)
- Annual testing of all hemodialysis patients is required to determine immunity, susceptibility and/or conversion. Susceptible patients should be tested more frequently until immunity has been established by vaccination. The frequency of testing (q monthly, q 2 months, or q 6 months) will depend on the patient population and risk (1, 4)
- Programs should have a policy for follow-up and testing of susceptible patients who have received hemodialysis at other facilities (e.g. while traveling).

4. Education: The hemodialysis program should have an educational plan for patients, their families and advocates. The program should also provide educational opportunities for healthcare workers to gain knowledge and familiarity in (1, 2, 3, 5):

- Transmission of bloodborne viruses
- Interpretation of HBV serology
- Routine Practices and Additional Precautions, including hand hygiene, and the donning and doffing of personal protective equipment
- Additional transmission based precautions (Airborne, Droplet, Contact)
- Consultation of Infection Prevention and Control for additional education regarding the appropriate management and prevention of HBV infection

References

1. Centers for Disease Control and Prevention. Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients. MMWR Recommendations and Reports. 2001; 50 (RR05); 1-43
2. Health Canada. Laboratory Centre for Disease Control, Division of Nosocomial and Occupational Infections. Infection Control Guidelines. Preventing the Transmission of Bloodborne Pathogens in Health Care and Public Service Settings. Canada Communicable Disease Report. 1997; Volume 23S3
3. Health Canada. Laboratory Centre for Disease Control, Division of Nosocomial and Occupational Infections. Infection Control Guidelines. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care. Canada Communicable Disease Report. 1999; Volume 25S4
4. Canadian Society of Nephrology. The Prevention of Transmission of Bloodborne Pathogens in Hemodialysis Patients. 2005
5. Health Canada. Laboratory Centre for Disease Control, Division of Nosocomial and Occupational Infections. Infection Control Guidelines. Prevention and Control of Occupational Infections in Health Care. Canada Communicable Disease Report. 2002; Volume 28S1