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INSIDE:

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2. Chaiyakunapruk N, Veenstra DL, Lipsky BA, Saint S. Chlorhexidine compared with povidone-iodine solution for vascular catheter-site care: A Meta-Analysis. Ann Intern Med. 2002;136:792-801.

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As I reflect upon nearly 20 years of practicing in infection prevention and control I am truly amazed at how this field has now become a "growth industry." There is much to celebrate during Infection Control Week 2005.

The growth in infection prevention and control has been spurred not only by constantly evolving and emerging microorganisms but also by highly motivated and visionary groups and individuals.

There have been sentinel points in the evolution of this vital area of practice including the responses to the development of penicillin-resistant *staph aureus*, blood borne transmitted organisms such as HIV, and the 1980s SENIC study. Another key event was the acknowledgement of Universal Precautions (or Body Substance Precautions) as key elements of infection control practice. These events continue to form the basis of our practices.

In the past few years, the frequency of sentinel events has dramatically increased and the time between major events is narrowing. In some cases the events have overlapped. A good example of this occurred during the SARS situation when Monkeypox and Canada's first case of bovine spongiform encephalitis (BSE) all occurred within a very short period of time.

Over the past few months, we have increasingly faced a global flu pandemic, which is likely to evolve from the current avian flu cases in the Far East and Asia.

Although many of these events have caused us to be in "reactive" mode and consume our human and material resources, we continue to be "proactive" in many areas. This proactivity is fostered and led by organizations such as CHICA –Canada, which for over 25 years has promoted excellence and practice and formed a cohesive network for development of infection prevention and control in Canada.

CHICA-Canada leaders and members are to be congratulated for the recent milestones and accomplishments that have put us all on the world stage. These include our website (*www.chica.org*), our growing membership (currently at record levels), our international involvements (including support for IFIC), our strong membership services office. And lastly, who can forget our hand hygiene mascot Sudsy?

Over the past few months, we have amassed a queue of articles for our journal; which is an important indicator of the evolution of and interest in the field of infection prevention and control in Canada.

As we celebrate the 2005 Infection Control Week, let us all give congratulate our fellow CHICA members and give ourselves a well-deserved "pat on the back." ●

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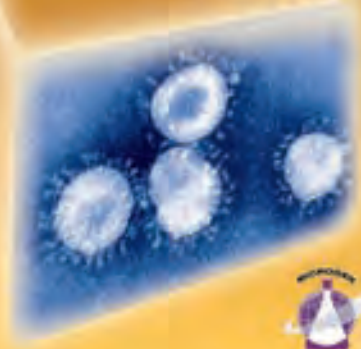

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Highlights of a busy season

Rick Wray, RN, BA, CIC

The volume and scope of CHICA-Canada activities continue to impress on me the impact that CHICA-Canada has and will continue to have as we approach our 30th anniversary.

In June, I attended the APIC 2005, Annual Education Conference and International Meeting in Baltimore, Maryland. The conference theme, "Charting the Course for Infection Control" reflected the changing environment and new challenges facing infection control professionals. APIC President, Sue Sebazco, hosted a breakfast meeting to explore ways in which APIC, CHICA-Canada, IFIC and CBIC could further collaborate. Several innovative ideas were discussed.

I also attended the board meeting of CBIC (Certification Board of Infection Control and Epidemiology Inc.) as the CHICA-Canada liaison. The Board is an impressive group of 15 committed experts led by President Betty Dunaway and includes Sheila MacDonald. Sheila was CHICA-Canada President in 2002 and is presently serving as a CBIC board member as Secretary and Chair of Policy and Procedures Committee. In the current climate of change, it is more important than ever for infection control professionals to be able to demonstrate their knowledge both in practice and through the formal recognition afforded by the certification process. As of April 2005, there were 228 Canadians Certified in Infection Control and I encourage all eligible CHICA members to become certified as a means of providing a standardized measurement of current basic knowledge needed to practice infection control. I'll remind ICPs in Ontario who are eligible for certification that full funding is available through the SARS Memorial Fund administered by the Registered Nurses Foundation of Ontario and sponsored by the Ontario Ministry of Health and Long-Term Care.

In July, I was asked to represent CHICA-Canada by participating in an Expert Roundtable on Infectious Diseases hosted by the Honourable Carolyn Bennett, Minister of State (Public Health) Government of Canada and the Honourable Theresa Oswald, Minister of Healthy Living, Government of Manitoba. This meeting is part of the process to develop Public Health Goals for Canada. It was a wonderful opportunity to position infection control priorities within the six established health promotion themes. It was also an opportunity to profile CHICA-Canada along side leaders in infectious diseases from across Canada. I encourage you to visit *www.healthycanadians.ca* to learn more about Public Health Goals for Canada.

I'd like to recognize the work of your CHICA-Canada Board members. They are a group of hard working, talented and committed professionals who represent the association extraordinarily well. Congratulations to Betty Ann Henderson, CHICA-Canada Director of Education, who has been asked to speak on "Complexity and Risk Management in Healthcare: the case of HAI" at the ULSS 20 conference in Verona, Italy. •

Faits saillants d'une saison chargée

Rick Wray, RN, BA, CIC

Le nombre et l'envergure de ces activités de CHICA-Canada trahissent l'influence qu'exerce et que continuera d'exercer CHICA-Canada à l'approche de son 30e anniversaire. J'aimerais ici partager certains faits saillants avec les quelque 1100 membres de CHICA-Canada.

En juin, j'ai participé à APIC 2005, la 32e conférence annuelle et réunion internationale à Baltimore, Maryland. Le thème, « Charting the Course for Infection Control» reflétait l'environnement changeant et les nouveaux défis que doivent relever les professionnels de la prévention des infections. La sécurité des patients, la divulgation obligatoire des infections reliées aux soins de la santé, les infections émergentes et ré-émergentes, la planification d'urgence et la prévention des désastres font toutes partie de cet environnement changeant et revenaient dans plusieurs présentations. La présidente d'APIC, Sue Sebazco, a présidé une réunion afin de voir comment APIC, CHICA-Canada, IFIC et CBIC pourraient travailler ensemble. Plusieurs idées intéressantes sont ressorties : nous vous tiendrons au courant!

J'ai aussi participé à la réunion du conseil du CBIC (Certification Board of Infection Control and Epidemiology Inc.) en tant que représentante de CHICA-Canada. Le conseil se compose de 15 experts dévoués sous la direction de la présidente Betty Dunaway et comprend notamment Sheila MacDonald. Sheila était présidente de CHICA-Canada en 2002 et agit présentement en tant que secrétaire et présidente du comité de politique et de procédures. Dans la situation actuelle, il devient de plus en plus important que les professionnels de la prévention des infections puissent démontrer leurs connaissances en pratique et par la reconnaissance de leurs pairs. En avril 2005, on comptait 228 Canadiens certifiés en prévention des infections. J'encourage tous les membres de CHICA admissibles à la certification de s'inscrire en tant que mesure normative des connaissances courantes de base en prévention des infections.

En juillet, j'ai représenté CHICA-Canada à une table ronde sur les infections organisée par la ministre d'État à la santé publique, l'honorable Carolyn Bennett et la ministre de la vie saine du Manitoba, l'honorable Theresa Oswald. Cette réunion faisait partie du processus de formulation d'objectifs pour la santé publique au Canada. Nous avons pu ainsi placer la prévention des infections au nombre des six thèmes de promotion de la santé établis. Nous avons aussi positionné CHICA-Canada au nombre des chefs de file en prévention des infections au Canada. Je vous invite à visiter *www.healthycanadians.ca* pour obtenir plus d'information sur cette initiative.

Je tiens à souligner le travail des membres du conseil de CHICA-Canada. Ce sont des professionnels travaillants, talentueux et dévoués qui représentent très bien l'association. Félicitations à Betty Ann Henderson, directrice de la formation de CHICA-Canada, qui a présenté une conférence intitulée « Complexity and Risk Management in Healthcare: the case of HAI» au congrès ULSS 20 à Vérone, Italie. ●

Debbie Lam-Li, Alice Newman and the CHICA-Dialysis Interest Group

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A survey of infection control practices in hemodialysis units in Canada

BACKGROUND

The treatment of end stage renal disease (ESRD) involves pre-dialysis care, renal replacement therapy with several dialysis modality options, and transplantation. The number of patients seen by renal replacement therapy facilities in Canada has increased annually from 1982 to 2001. Information available through the Canadian Organ Replacement Registry (CORR) illustrates that over half of patients with ESRD are managed by dialysis with over 80% of these receiving hemodialysis as the treatment option.[1] Currently there are over 12,000 Canadians receiving hemodialysis.

Canadian clinical practice guidelines cosponsored by the Canadian Society of Nephrology and the Kidney Foundation of Canada do exist for the treatment of patients with chronic renal failure, however specific recommendations regarding infection control practices are limited and deal only with the prevention of clinical infection. In April 2001, the Centers for Disease Control and Prevention (CDC) released Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients, which specifically addressed the many opportunities that exist in the dialysis setting for the spread of infection.[2] Professionals in the dialysis community have largely accepted the comprehensive document for use especially since there is no Canadian equivalent.

A group of interested infection control practitioners from across Canada conducted a survey to examine current practices in Canadian hemodialysis units. The purpose of the survey was to examine how other Canadian centres managed some of the practices surrounding infection control issues within the hemodialysis setting, to assess adherence to these American-based recommendations and to determine the usefulness of Canadian-based guidelines.

METHODS AND PROCEDURE

Study Design

A questionnaire-based survey was done of all Canadian healthcare facilities that provide hemodialysis for patients with end-stage renal disease. The CHICA Dialysis Interest Group members selected questions from previous chat room discussions. Questions were grouped under related subject headings. Prior to distribution. the prepared questionnaire was reviewed by two other Infection Control practitioners, two nephrology nurse instructors, and one dialysis machine technical coordinator. The questionnaire was five pages in length to capture as much relevant information as possible and was sent with an explanatory cover letter. Respondents were requested to supply the name of their unit and contact information, however all survey responses were coded numerically to respect confidentiality.

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Procedure

The mailing list of Canadian healthcare facilities with hemodialysis programs was compiled from the Directory of Participating Dialysis Centres, Transplant Centres and Organ Procurement Organizations in Canada 2004, a publication of the Canadian Institute for Health Information [3] and matched to the Membership list for CHICA-Canada to identify Infection Control Practitioners (ICP) associated with specific hemodialysis program.

The survey questionnaire was sent directly (via e-mail) to the infection control practitioners associated with the specific hemodialysis program where the infection control practitioner was identified. For hemodialysis programs that do not have an affiliated infection control practitioner, the questionnaire was sent to the director or the manager of the program. In addition, the questionnaire was posted on CHICA-Canada website so that any infection control practitioners affiliated with small or satellite hemodialysis programs could also participate in the survey.

Participants were asked to respond to the survey within four weeks. To ensure adequate representation from all areas of the country, a group e-mail was sent at that time thanking those who had already responded and reminding others of the purpose of the survey.

RESULTS and DISCUSSION

Responses were received from 38 infection control practitioners, 18 hemodialysis nursing staff, two dialysis machine technicians and one nephrologists – representing 48 of the 108 hemodialysis programs in Canada listed in the Directory. Most of the questionnaires were received within four weeks of them being sent.

The questionnaire was divided in 15 sections for the respondents to answer. Results are presented and discussed under individual subject headings below.

Demographics

It is not known how many hemodialysis units actually exist in Canada as the Directory of Participating Dialysis Centres, Transplant Centres and Organ Procurement Organizations in Canada 2004, lists only the participating hemodialysis programs. For this survey, we defined community-based units as units that perform dialysis on outpatients only, regardless whether the units are housed within a hospital.

Overall 44% (48 of 108) of the listed hemodialysis programs participated in the survey. Within the 48 hemodialysis programs, 89 different units responded to the questionnaire. Of the 89 returned questionnaire, 51 (57.3%) were from in-centre units, six (6.7%) were pediatric units and the remaining 36% (32 of 89) were community-based satellite units of same hemodialysis programs. Based on the Directory of Participating Dialysis Centres, Transplant Centres and Organ Procurement Organizations in Canada 2004, participation rate is as follows on Table 1. These 89 participating hemodialysis units reported a total of 1,522 hemodialysis stations, which serviced 7,671 patients and provided 93,897 treatments per month. A profile of the participating units is shown in Table 2. The results showed that there are vast differences in the number of stations, patients and treatments per month among the units polled. Further analysis of the data by the size of the unit would be needed to detect differences in unit design and in the infection control practices used by large, medium and small units.

Table 1. Participation of hemodialysis programs by provinces and territories

	Hemodialysis programs participated/Hemodialysis programs listed in the Directory	Participation per Hemodialysis programs listed in the Directory
Alberta	2/2	100%
British Columbia	4/11	36%
Manitoba	1/5	20%
New Brunswick	3/4	75%
New Foundland	1/3	33%
Northwest Territory	1/1	100%
Nova Scotia	3/4	75%
Ontario	20/44	46%
Quebec	12/32	38%
Saskatchewan	1/2	50%
Total	48/108	44%

Table 2. Profile of the participating hemodialysis units

Number	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)	Total (n=89)
Dialysis stations per hemodialysis unit (median)	20 (range: 3 to 76)	5 (range: 2 to 8)	7 (range: 2 to 21)	13 (range: 2 to 76)
Patients per month (median)	120 (range: 6 to 440)	6 (range: 0 to 8)	33 (range: 2 to 143)	66 (range: 0 to 440)
Treatments per month (median)	1316 (range: 65 to 7280)	71 (range: 0 to 88)	413 (range: 24 to 1489)	792 (range: 0 to 7280)

(Note: For the 3 in-centre units that did not provide complete data, the number of patients and the number of treatments were extrapolated from the number of dialysis stations)

Unit Design

We looked at unit design to find out how the survey results compared to some pertinent physical design requirement set by the American Institute of Architects Academy 2001 Guidelines for Design and Construction of Hospital and Healthcare Facilities.[4] Additional information pertaining to the set up of isolation rooms and waiting areas are presented in Table.3.

Only 52% of the units polled meet minimum space requirement and 62% meet hand washing sink standards stated in the American Institute of Architects Guidelines for design and construction of hospital and healthcare facilities, 2001.[4] These same guidelines also suggest that an Infection Control Risk Assessment be conducted to determine the need for negative pressure ventilation rooms and the number needed within a hemodialysis unit.

Of the 51 units surveyed, 43% of the in-centre units reported the availability of negative pressure ventilated rooms for airborne isolation. In-centre units have higher percentage of isolation rooms and negative pressure ventilated rooms than the community-based units. Units without isolation rooms and/or negative pressure ventilation indicated that they transfer out patients who require isolation using transfer criteria established by their own hemodialysis program. The practice of transferring patients who require isolation is also common for other problems such as antibiotic resistant organisms, Hepatitis, TB and other selected infections. These are presented later in this report.

Table 3: Design aspects of the hemodialysis units surveyed

Units with:	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)	Total (n=89)
Minimum 80 sq ft treatment space	27 (78%)*	4 (67%)	9 (41%)*	40 (52%)*
Minimum 1 sink per 4 hemodialysis stations	29 (57%)	6 (100%)	20 (62%)	55 (62%)
Waterless hand hygiene product available	46 (90%)	6 (100%)	23 (72%)	75 (84%)
Sink in waiting area	24 (47%)	1 (17%)	14 (44%)	39 (44%)
Waterless hand hygiene product in waiting area	33 (65%)	2 (33%)	11 (34%)	46 (52%)
Masks in waiting area	8 (16%)	2 (33%)	3 (9%)	13 (15%)
Kleenex in waiting area	15 (29%)	1 (17%)	10 (31%)	26 (29%)
Isolation room	43 (84%)	5 (83%)	11 (34%)	59 (66%)
Isolation room with negative pressure ventilation	22 (43%)	2 (33%)	0	24 (27%)
Isolation room with anteroom	16 (31%)	2 (33%)	0	18 (20%)

(Note: only 49/51 in-centre units and 22/32 community based units have provided data for this question.)*

Patient Profile: Utilization of Arteriovenous Access Types

Tables 4, 5 and 6 compare the survey results regarding reported use of various types of vascular access to that reported in the Canadian Organ Replacement Register (CORR) published in 2002. Arteriovenous fistula (AVF) access is of interest to Infection Control because the published literature reports significantly lower rates of infection associated with its use.[2, 5] Current recommendations from the American National Kidney Foundation (K/DOQI) support the practice of using native AVF for 40% of prevalent patients in a program. The leading principle of this DOQI guideline is that at least 50% of all new kidney failure patients electing to receive hemodialysis as their initial form of renal replacement therapy have a primary AVF constructed.[6] Corresponding Canadian recommendations from the Canadian Society of Nephrology suggest that more than 60% of prevalent patients should have a native AVF.[7]

Ideally, arteriovenous grafts (AVG) should only be inserted when the patient is not a candidate for AVF.[6] Canadian figures show that AVG are used at a much lower rate as compared to published American data (Table 5). The CDC National Surveillance of Dialysis-associated Disease reported that 48% of patients received dialysis through AVG in 2000.[8] The CORR data from 2000 reported 18.3 % of total hemodialysis patients with a synthetic AVG.[1] In a recently published Canadian study of bloodstream infections in hemodialysis patients, the relative risk of a blood stream infection was 2.5 times higher for an AVG versus an AVF.[9] Although this survey did not request specific data on infection rates, the literature shows that the risk of infection in patients using CVC is significantly higher than in those using AVG and AVF.[5, 9] Recently published Canadian data by Taylor et al shows the relative risk of infection from a tunneled catheter is 15 times that of a native fistula.[9] The survey questionnaire requested information on the percentage of patients using different types (permanent, temporary or femoral) of central venous catheters (CVC), however its specific usage was not defined in the question asked. Many units may have reported patients using a CVC while the fistula is waiting placement or maturing of the fistula. The K/DOQI (guideline #30) recommends that less than 10% of chronic hemodialysis patients be maintained on catheters as their permanent dialysis access.[6] Table 6 only reflect the point prevalence of catheters use within the different types of dialysis units.

Patient Profile: Carriage of MRSA, VRE, HBV and HCV

Table 7 compares survey results for the presence of Methicillin-resistant *Staphylococcus aureus* (MRSA), Vancomycin-resistant *Enterococcus* (VRE), Hepatitis B virus (HBV) and Hepatitis C virus (HCV) to that reported by the CDC National Surveillance of Dialysis-associated Diseases in the United States, 2000.[8]

In 2004, the survey results show that the current prevalence of MRSA and VRE in hemodialysis patients in Canada were similar to those reported in 2000 in the United States (Table 7).[8] In-centre units have a significantly higher per-

Table 4. Use of Ateriovenous Fistula (AVF) as compared to Canadian Organ Replacement Register (CORR) data published in 2002, by provinces and territories

Province/Territory	Use of Arteriovenous Fistula (AVF) by Type of Hemodialysis units (% Range)			CORR data 2002
	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)	
Alberta	17 to 60%	0 %	6.5 to 75%	36.1%
British Columbia	30 to 48%	60%	65 to 85%	52.1%
Manitoba	37%	n/a	n/a	65.5%
New Brunswick	30 to 65%	n/a	n/a	49.4%
Newfoundland	54%	n/a	n/a	58.9%
Nova Scotia	60%	n/a	n/a	79.9%
Northwest Territory	67%	n/a	50%	Not available
Ontario	8 to 84%	25%	15 to 78%	46%
Quebec	25 to 78%	25%	n/a	56.2%
Saskatchewan	39%	n/a	n/a	48.4%

Table 5. Use of Ateriovenous Graft (AVG) as compared to Canadian Organ Replacement Register (CORR) data published in 2002, by provinces and territories

Province/Territory	Use of Arterioveneous Grafts by Type of Hemodialysis units (% Range)			CORR data 2002
	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)	
Alberta	7 to 24%	0	8 to 91%	20.1%
British Columbia	10 to 19%	0	8 to 20%	24.9%
Manitoba	0	n/a	n/a	17.2%
New Brunswick	3 to 15%	n/a	n/a	7.4%
Newfoundland	15%	n/a	n/a	26.8%
Nova Scotia	1.5%	n/a	n/a	1.4%
Northwest Territory	17%	n/a	50%	Not available
Ontario	0 to 22%	0	0 to 17%	17.9%
Quebec	0 to 5%	0	n/a	21.2%
Saskatchewan	23%	n/a	n/a	11.7%

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For full prescribing information, please see Adacel product monograph.

1. Canadian National Report on Immunization, 1997. *Paediatric Child Health* Vol 3 Suppl B March/April 1998. 2. Health Canada, *National Consensus Conference on Pertussis. Canada Communicable Disease Report* 2002;29S1:1 - 33. 3. Health Canada, National Advisory Committee on Immunization. *Prevention of Pertussis in Adolescents and Adults. Canada Communicable Disease Report* 2003;29:1 - 9. 4. Vaccine Preventable Diseases – Pertussis, Health Canada. Available at www.hc-sc.gc.ca/pphb-dgspsp/bid-dmi/vpd-mev/pertussis_e.html, accessed on January 13, 2003. 5. Adacel Product Monograph, Aventis Pasteur Limited, September 2002.

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Table 6. Use of Central Venous Catheter as compared to Canadian Organ Replacement Register (CORR) data published in 2002, by provinces and territories

Province/Territory	Use of Central Venous Catheter (CVC)Access by Type of Hemodialysis unit (% Range)			CORR data 2002
	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)	
Alberta	23 to 82%	100%	2 to 42%	43.8%
British Columbia	35 to 65%	40%	8 to 20%	23%
Manitoba	65%	n/a	n/a	17.4%
New Brunswick	20 to 67%	n/a	n/a	41.2%
New Foundland	35%	n/a	n/a	14.4%
Nova Scotia	40 to 49%	n/a	n/a	17.6%
Northwest Territory	17%	n/a	0	Not available
Ontario	16 to 84%	75%	19 to 75%	36.1%
Quebec	22 to 77%	75%	n/a	22.6%
Saskatchewan	38%	n/a	n/a	40%

Table 7. Prevalence of MRSA, VRE, HBV and HCV in one or more patients by Type of Hemodialysis unit: Comparison of survey results to CDC report, 20008

	One or More Positive Patients				
	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)	Total (n=88)	CDC report 2000[8]
MRSA	68%	0	9%	43%	71%
VRE	28%	0	6%	20%	33%
Hepatitis B	38%	0	3%	24%	26%
Hepatitis C	44%	0	25%	35%	Not available

centage of patients positive for MRSA and/or VRE. These results are likely a reflection of the practice of some hemodialysis programs to restrict admission of MRSA and/or VRE positive patients from their community based units.

The prevalence of Hepatitis B and Hepatitis C among the hemodialysis units surveyed indicates the need to establish and comply with stringent infection control guidelines to prevent transmission of these blood-borne pathogens within the hemodialysis setting (Table 7).[2]

Antibiotic resistant organisms

For the most part, community-based units share the same antibiotic resistant organism screening policies as their respective in-centre units. However, the practice of isolation depends on the availability of isolation rooms, or the policy of not accepting positive patients (i.e. transfer out positive patients).

The antibiotic resistant organisms surveyed include MRSA, VRE, extended spectrum beta-lactamase resistance (ESBL) and mupirocin resistant *Staphylococcus aureus*. Survey results pertaining to the isolation practice of MRSA, VRE and ESBL, availability of prevalence screenings and decolonization protocols are presented in Table 8. Details regarding prevalence screening schedules and MRSA decolonization regimen are listed in Appendix A and B.

Of the in-centre units polled, 80% reported practice of isolation or additional precautions for MRSA/VRE despite CDC *Recommendations for Preventing Transmission of Infections among Chronic hemodialysis Patients 2001* that such practice is not warranted.[2] A majority (>80%) of the units surveyed also reported screening of MRSA and VRE after patients returned from travel.

Routine prevalence screening of patients for MRSA and VRE was also practiced by some units. Currently, there are no established guidelines regarding the prevalence screening schedule and specimen culture sites. The survey showed there are differences in MRSA decolonization regimens and follow-up screening protocols as reported by the units (Appendix A and B). In this survey, units that practiced decolonization reported endemic MRSA carriage up to 15% of patient population. Further research is needed to determine the usefulness of MRSA decolonization, the optimum decolonization regimen and screening protocols applicable to the dialysis settings.

Hepatitis B and Hepatitis C

Of the 89 units surveyed, 88 (99%) reported that HBV immunization was provided for patients either by the hemodialysis program, through patient's family doctors or through public health. One in-centre 1/89 (1%) reported HBV vaccination program was only available to renal transplant patients (Table 10).

For the 87 units that reported new patients screening for HBV, 84 (97%) reported doing the screening prior to or at first dialysis (Table 10). Of the remaining three units (3%), one unit from each of in-centre, community based and pediatric, reported HBV screening of new patients was performed within two weeks of the first dialysis.

For routine HBV and HCV serologic testing, community-based units shared the same protocol as their respective in-centre units (Table 11). Our results showed that HBV and HCV routine serologic testing schedules for HBV-immune patients (annually), HBV-susceptible patients (monthly) and HCV-negative patients (semi-annually) were comparable to those in the CDC Recommendations for Preventing Transmission of Infections Among Chronic hemodialysis Patients, 2001.[2]

The highlighted cells in Table 11 show the percentage of units which follow serologic testing schedule as outlined in

Table 8. Infection control practices for patients positive for MRSA, VRE and ESBL

	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)
Isolate or have additional precautions for MRSA+ patient	40 (80%)	4 (67%)	19 (59%)
No isolation or additional precautions for MRSA+ patients	9 (18%)	2 (33%)	7 (22%)
Transfer out MRSA+ patients	1 (2%)	0	6 (19%)
Isolate or have additional precautions for VRE+ patient	40 (80%)	4 (67%)	20 (63%)
No isolation or additional precautions for VRE+ patients	9 (18%)	2 (33%)	6 (19%)
Transfer out VRE+ patients	1 (2%)	0	6 (19%)
Isolate or have additional precautions for ESBL+ patient	25 (50%)	3 (50%)	11 (34%)
No isolation or additional precautions for ESBL+ patients	25 (50%)	3 (50%)	21 (66%)

No units reported transfer out ESBL+ patients.
(Note: due to rounding off, the % reported in the above table may not add up 100)

Table 9. Screening and decolonization of patients positive for MRSA, VRE and mupirocin resistant *Staphylococcus aureus*

	In-centre units (n=50)	Pediatric units (n=6)	Community based units (n=32)
Screen new patients for MRSA	45 (90%)	4 (67%)	30 (94%)
Screen new patients for VRE	43 (86%)	3 (50%)	30 (94%)
Screen new patients for Mupirocin resistant *Staphylococcus aureus*	1 (2%)	1 (25%)	2 (6%)
Screen travel returns for MRSA	47 (94%)	5 (83%)	29 (91%)
Screen travel returns for VRE	43 (86%)	5 (83%)	29 (91%)
Screen travel returns for Mupirocin resistant *Staphylococcus aureus*	2 (4%)	1 (17%)	1 (3%)
Prevalence screening for MRSA	29 (58%)	3 (50%)	13 (41%)
Prevalence screening for VRE	27 (54%)	2 (33%)	12 (38%)
Decolonize MRSA + patient	28 (55%)*	2 (33%)	5 (16%)
Decolonize VRE + patient	1 (2%)*	0	1 (3%)

*(*Note: 51 in-centre units responded to this question.)*

Table 10. Isolation practice and screening of HBV and HCV

	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)
Isolate or segregate HBV+ patients	35 (69%)	3 (50%)	20 (63%)
No isolation or segregation of HBV+ patients	13 (26%)	3 (50%)	4 (13%)
Transfer out HBV+ patients	3 (6%)	0	8 (25%)
Isolate or segregate HCV+ patient	5 (10%)	1 (17%)	0
No isolation or segregation of HCV+ patients	46 (90%)	5 (83%)	32 (100%)
Transfer out HCV+ patients	0	0	0
Screen new patients for HBV	51 (100%)	5 (83%)	31 (97%)
Screen new patients for HCV	48 (94%)	5 (83%)	31 (97%)

(Note: due to rounding off, the % reported in the above table may not add up 100)

CDC *Recommendations for Preventing Transmission of Infections Among Chronic hemodialysis Patients 2001*. Survey respondents reported that the frequency of routine serologic testing of HBV and HCV was largely dependent on the availability (or lack of) lab resources.

American data has shown that the independent risk factors for a dialysis patient acquiring HBV infection include the presence of a least one HBV-infected patient within the unit who is not isolated and a <50% hepatitis B vaccination rate among patients.[2,10] A survey question asking for the proportion of HBV immunized patient had a low response rate (<40%) and was not included in the analysis. One of the reasons for the low response rates could be that patient records of HBV and HCV status were not readily available on these units.

Tuberculosis

The 2000 Canadian Tuberculosis Standards states that depending on local epidemiology and resources, TB screening should be considered for those with high-risk medical conditions, including patients with chronic renal failure.[11] Table 12 presents survey results pertaining to the prevention and management TB in hemodialysis patients.

A hemodialysis patient who requires airborne isolation may either wear a surgical mask or reside within a negative pressure ventilated room during dialysis.[12,13] Within the in-centre units over half of the units (57%) accommodate the patient, while in the community based units, most (88%) patients are transferred out. Of the units that offer TB skin testing, it would be interesting to know how many require a follow-up chest X-ray of skin test positive patients.

Influenzae and Pneumococcal Immunization

Hemodialysis patients are in close proximity to other patients and there is a risk of transmission within the hemodialysis unit.[14,15] In addition, host risk factors for hemodialysis patients include diabetes, immune impairment, iron overload, low

Table 11. Schedule of HBV and HCV routine serologic testing

	In-centre Units (N=50)			Pediatric Units (N=6)		
Testing Schedule	HBV-immune patients	HBV-susceptible patients	HCV-negative patients	HBV-immune patients	HBV-susceptible patients	HCV-negative patients
Per 12 months	**39 (78%)**	7 (14%)	15 (30%)	**3 (50%)**	0	1 (17%)
Per 6 months	7 (14%)	10 (20%)	**24 (48%)**	1 (17%)	0	**3 (50%)**
Per 4 months	1 (2%)	1 (2%)	1 (2%)	0	0	0
Per 3 month	2 (4%)	3 (6%)	1 (2%)	0	0	0
Per 1 month	0	**26 (52%)**	0	0	**4 (67%)**	0
Per 6 weeks	0	1 (2%)	0	0	0	0
Schedule not provided	1 (2%)	1 (2%)	1 (2%)	0	0	0
Routine testing not done	0	1 (2%)	8 (16%)	2 (33%)	2 (33%)	2 (33%)

Table 12. Screening and Isolation practices for patients with TB

	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)
Isolate TB+ patient in negative pressure ventilated room	22 (43%)	2 (33%)	0
Isolate TB+ patient in regular single room with or without HEPA filter. Staff or patient wears appropriate masks.	5 (10%)	0	2 (6%)
No isolation. Patient wears surgical mask.	2 (4%)	0	2 (6%)
Transfer out TB+ patient	22 (43%)	4 (67%)	28 (88%)
Mantoux new patient	24 (47%)	1 (17%)	17 (53%)
Mantoux yearly follow-up	7 (14%)	0	2 (6%)
Mantoux using 2-step method	8 (16%)	0	2 (6%)

serum albumin, and the need for TPN. As a result hemodialysis patients are at increased risk for community-acquired infections, such as influenza and pneumococcal infections. hemodialysis patients are also considered to have a high risk of developing post-influenza-related complications.

Streptococcus pneumoniae is the most common cause of community-acquired bacterial pneumonia. Concomitant bacteremia occurs in approximately 10%-25% of adult patients who have Pneumococcal pneumonia.[16] The highest mortality in cases of bacteremia occurs among the elderly and patients who have underlying medical conditions. *Streptococcus pneumoniae* is the most common causative organism of community-acquired pneumonia in dialysis patients. The incidence of pneumonia in dialysis patients has been reported to be as high as 4.9 episodes per 1,000 patient months; of these, 53% were due to *Streptococcus pneumoniae*.[15]

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Table 13 shows the availability of vaccination programs for the different types of hemodialysis units. Pneumococcal vaccination and annual influenza vaccination is highly recommended for hemodialysis patients. Of the 89 units surveyed, Pneumococcal and annual Influenza vaccination are provided either by the hemodialysis program, through patient's family doctors or the public health. Units that reported record keeping of these vaccinations were considered having an immunization program. Many in-centre and pediatric units provide a pneumococcal and annual influenza vaccination program for their patients, however, the practice is less common for the community-based units.

Table 13. Availability of Pneumococcal and Annual Influenza vaccination programs

	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)
Annual Influenza vaccination available	47 (92%)	6 (100%)	21 (66%)
Pneumococcal vaccination available	41 (80%)	5 (83%)	16 (50%)

Isolation precautions for patients with selected infections

Frequent use of antibiotics rendered hemodialysis patients vulnerable to *Clostridium difficile* associated diarrhea (CDAD). In recent years, CDAD has become epidemic in certain regions in Canada, and increasing severity of CDAD has been reported.[17,18] Health Canada does not have specific recommendations for isolation practices on hemodialysis units.

Table 14 shows the reported isolation practices of Canadian hemodialysis Units. Of the 89 units surveyed, the majority 63/89 (71%) reported that they initiated isolation or additional precautions to prevent transmission of CDAD. An additional six (7%) units transfer out patients with CDAD. Of the 20 (22%) units who reported that they used no specific isolation precautions for CDAD, all, with the exception for three (6%) in-centre units and two (6%) community-based units, reported using additional precautions for patients with a diarrhea illness.

Health Canada recommends airborne transmission precautions, which require placing the patient in a negative-pressure ventilated room, or in single room with or without HEPA filter for patients with chicken pox and disseminated shingles in an ambulatory care setting.[13] Majority of the hemodialysis units surveyed supported this practice (Table 14). The four (6%) units that reported not practicing isolation or additional precautions did not provide a rationale other than that the units have not had patient with chicken pox or disseminated shingles. This could indicate that these patients are managed elsewhere. Although 22% of the units reported using additional precautions for febrile respiratory illness and diarrhea illness, it is not known what these measures entailed and how they are applied. It may be useful to inquire this information, including how the illnesses are defined.

Infection surveillance

Hemodialysis patients are at highest risk of vascular access related bloodstream infections (BSI). Surveillance

Table 14. Isolation and additional precautions of patients with selected infections

	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)
Use isolation or additional precautions for CDAD+ patients	43 (84%)	0	20 (66%)
Transfer out CDAD+ patients	1 (2%)	0	5 (16%)
Isolation or additional precautions for patients with Chicken Pox/Disseminated Shingles	29 (57%)	3 (50%)	2 (6%)
Transfer out patients with Chicken Pox/Disseminated Shingles	20 (39%)	3 (50%)	28 (88%)
No isolation or additional precautions for patients with Chicken Pox/Disseminated Shingles	2 (4%)	0	2 (6%)
Additional precautions for febrile respiratory illness	11 (22%)	2 (33%)	7 (22%)
Additional precautions for diarrhea illness	11 (22%)	2 (33%)	6 (19%)

of BSI and access site infection was reported by 42/51 (82%) of the in-centre units, 5/6 (83%) of the pediatric units, and 25/32 (73%) of the community-based units. Tables 15, 16 and 17 present the survey results for surveillance of bloodstream infections (BSI) and access site infections, the surveillance definitions used, how blood cultures (BC) are collected and how infection rates are calculated. Over 80% (72 of 89) of the centres reported conducting surveillance of BSI with 60 of the 72 also doing surveillance for access site infections (Table 15). No units reported conducting surveillance on vascular access infection alone. All units reported collecting blood cultures from dialysis lines only or from both dialysis lines and peripheral sites. No units reported collecting blood from peripheral sites alone. The survey results indicated inter-centre comparison of infection rate is not feasible due to differences in applying the surveillance definitions, clinical definition and "spontaneous bacteremia" to explain BSI without focal infection (Table 16). It may be useful information to inquire if units conduct surveillance on adverse outcomes of BSI such as osteomyelitis, epidural abscess, endocarditis and death.

Table 17 shows that the reported denominators used to calculate infection rates varied widely among the hemodialysis units participating in the survey. Of note, since 2000 the CDC Dialysis Surveillance Network has implemented a surveillance system for hemodialysis-associated infections. The denominator used by this new surveillance system for calculating infection rates is based on patient-months. [5] One respondent reported the trial use of this denominator for 18 months. As this denominator was devised to simplify data collection, it may be applicable to units that have trouble collecting traditional denominator data.

Table 15. Surveillance programs and practice of blood culture collection			
	In-centre units (n=51)	Pediatric units (n=6)	Community based units (n=32)
Surveillance not done	9 (18%)	1 (17%)	7 (22%)
Surveillance on BSI only	7 (14%)	0	5 (16%)
Surveillance on both BSI and access site infections	35 (69%)	5 (83%)	20 (63%)
Use clinical definition	20 (39%)	1 (17%)	20 (63%)
Use the term "spontaneous bacteremia"	7 (14%)	1 (17%)	1 (3%)
BC collected from dialysis lines only	37 (73%)	1 (17%)	29 (91%)
BC collected from both lines and sites	14 (27%)	5 (83%)	3 (9%)
BC routinely repeated after completion of antibiotic	19 (37%)	4 (67%)	20 (63%)

No units reported performing surveillance on access site only (Note: due to rounding off, the % reported in the above table may not add up 100)

Table 16. Surveillance definitions used by the respondents			
	In-centre units (n=42)	Pediatric units (n=5)	Community based units (n=25)
Use CDC surveillance definitions	8 (19%)	1 (20%)	12 (48%)
Use Health Canada surveillance definition	12 (29%)	1 (20%)	8 (32%)
Use combined CDC/Health Canada or in-house modified surveillance definition	22 (52%)	3 (60%)	4 (16%)
No information provided on definitions used	0	0	1 (4%)

Table 17. Denominators used in the calculation of infection rate for BSI surveillance			
	In-centre units (n=42)	Pediatric units (n=5)	Community based units (n=25)
Infection rate not calculated (line list only)	10 (24%)	2 (40%)	1(4%)
Infection rate per number of patients	10 (24%)	1 (20%)	4 (16%)
Infection rate by number of patient days	16 (38%)	2 (40%)	9 (36%)
Infection rate per number of dialysis runs	19 (45%)	1 (20%)	19 (76%)
Infection rate per number of access days	8 (19%)	0	3 (12%)

(Note. Some units report using more than one denominator in the calculation of infection rates)

Table 18. Antibiotics used for empiric treatment of Hemodialysis access related bloodstream infections			
	In-centre units (n=47)	Pediatric units (n=5)	Community based units (n=28)
Use vancomycin alone	5 (11%)	2 (40%)	1 (4%)
Use vancomycin with gentamicin/tobramycin	7 (15%)	1 (20%)	7 (25%)
Use Ancef alone	10 (21%)	0	4 (14%)
Use Ancef with gentamicin/tobramycin	13 (28%)	0	11 (39%)
Use vancomycin and/or Ancef, physician dependent	9 (19%)	0	2 (7%)
Selection of antibiotics is situational	3 (6%)	2 (40%)	3 (11%)

Antibiotic utilization

The survey results showed it was common practice within the hemodialysis units to empirically treat hemodialysis access related bloodstream infections. Empiric treatment was given by 47/51 (92%) of the in-centre units, 5/6 (83%) of the pediatric units and 28/32 (88%) in the community-based units. Table 18 shows the primary choice of antibiotics used for empiric treatment of hemodialysis access related bloodstream infections.

The Hospital Infection Control Practices Advisory Committee (HICPAC) and Health Canada both recommend judicious use of vancomycin to prevent the development of VRE.[19,20] About 30% of the units surveyed reported using vancomycin with or without gentamicin or tobramycin and about 50% of the units reported using first generation cephalosporins (Ancef) with or without gentamicin or tobramycin as their primary empiric treatment choice. Some units reported that vancomycin is used as an alternative if patient is allergic to penicillins and/or cephalosporins. This practice is in accordance to CDC recommendation that the use of first generation cephalosporin should be considered first. It may be useful to identify if there is an association between vancomycin use and MRSA and VRE prevalence, and with cephalosporin use and CDAD prevalence within the dialysis settings.

Antiseptic Agents

The principles of antisepsis apply to many procedures within the hemodialysis units including the management of supplies, handling of contaminated equipment/linen, and the use of clean, aseptic versus sterile techniques for specific procedures. The choices of antiseptic agent used within the hemodialysis units may vary for each procedure and patient. Table 19 and 20 show the antiseptic agents used by the units.

Table 19. Antiseptic agent chosen to cleanse skin prior to needling AVF/AVG site

	In-centre units (n= 50)	Pediatric units (n=6)	Community based units (n=32)	Total (n= 88)
Skin cleansed with 70% alcohol	4 (8%)	1 (17%)	5 (16%)	10 (11%)
Skin cleansed with .5% CHG in 70% alcohol	13 (26%)	1 (17%)	13 (41%)	27 (31%)
Skin cleansed with 2% CHG (alcohol content not specified)	26 (52%)	3 (50%)	12 (37%)	41 (47%)
Skin cleansed with iodophor	8 (16%)	1 (17%)	5 (16%)	14 (16%)
Other agents	1 (2%)*	0	0	1 (1%)

** electrolytically produced chlorine based disinfectant (Note. Some units report using more than one agent)*

Table 20. Antiseptic agent chosen to cleanse skin surrounding CVC site

	In-centre units (n= 50)	Pediatric units (n=6)	Community based units (n=32)	Total (n= 88)
Skin cleansed with .5% CHG in 70% alcohol	11 (22%)	2 (33%)	18 (56%)	31 (35%)
Skin cleansed with 2% CHG (alcohol content not specified)	32 (64%)	3 (50%)	10 (31%)	45 (51%)
Skin cleansed with iodophor	9 (18%)	1 (17%)	7 (22%)	17 (19%)
Sterile saline	1 (2%)	0	0	1 (1%)
Other agents	1 (2%) *(Polysporin)*	0	3 (9%)* 3	(3%)

** electrolytically produced chlorine based disinfectant (Note. Some units report using more than one agent)*

Table 21. Antiseptic agent chosen to cleanse CVC prior to venous access

	In-centre Units (n= 50)	Pediatric Units (n=6)	Community Based units (n=32)	Total (n=88)
2% CHG in 4 % alcohol	12 (24%)	1 (17%)	7 (22%)	20 (23%)
0.5% CHG in 70% alcohol	6 (12%)	0	13 (41)	19 (22%)
2% CHG (alcohol content not specified)	14 (28%)	0	6 (19%)	20 (23%)
CHG (concentration and alcohol content not specified)	7 (14%)	1 (17%)	2 (6%)	10 (11%)
Iodophor	10 (20%)	3 (50%)	6 (19%)	19 (22%)
Other agents	0	2 (33%) *(alcohol)*	2 (6%)* 1 (3%) *(hydrogen peroxide)*	5 (6%)

** electrolytically produced chlorine based disinfectant (Note. Some units report using more than one agent)*

Centers often listed the use of two antiseptic products used for some applications. The primary antiseptic agent chosen by a unit may be most appropriate for one type of application and satisfactory for other applications (Tables 19 and 20). Many units have the availability of 2% chlorhexidine gluconate (CHG) and may have chosen to also use it for fistula access as well. The choice of antiseptic agents around CVC has been complicated by the concern of the presence of alcohol on a catheter containing polyurethane material. Some of the catheter manufactures warn that the presence of alcohol may lead to the degradation and cracking of the catheter. Despite this, 35% of units chose to use an agent with a 70% alcohol. The CDC Guidelines on the Prevention of Intravascular Catheter-Related Infections recommends that the product used for catheter-site care be compatible with the catheter material.[21] The majority of the units reported using 2% CHG but unfortunately the alcohol content of this agent was often not mentioned (Table 20).

CHG was the overwhelming favorite antiseptic agent despite the American based K/DOQI 2000 recommendations that providone-iodine be used prior to accessing the lumen of the CVC 6. Similar to the cleansing of AVF and AVG needling sites, information regarding the alcohol content of CHG was not always provided. However, as explained previously, it was apparent that the alcohol content in the CHG used for cleansing was not a concern in many units that prefer to have one product for all applications.

Hemodialysis access management

The Canadian Society of Nephrology recommends that catheter care and accessing thepatient's circulation be carried out as sterile procedures.[7] However, the document states that the evidence for maintaining sterility as opposed to maintaining clean (non-sterile) is inconclusive. Presuming that units using sterile gloves also practice sterile technique for vascular access, the survey results show that the practice

of sterile technique versus clean technique are more or less equal in the adult units (Table 22). It is generally accepted that the nares are a reservoir for *Staphylococcus aureus* colonization of the skin and potential wound infection. The incidence of *Staphylococcus aureus* nasal colonization in the general population is 10-30 %, in the hemodialysis population, the incidence has been documented to be higher than this figure.[22, 23] Table 23 shows the reported rates of *Staphylococcus aureus* carriage prior to vascular access. Of the units polled, it was not common practice to screen the patient for *Staphylococcus aureus* prior to central venous interventions or hemodialysis vascular access surgery (Table 23). It would be interesting to know the follow-up measures in units that support this screening practice, and whether this practice results in less post-intervention or post-surgical infections. The CDC guidelines for hemodialysis patients recommend that healthcare workers wear disposable gloves when caring for the patient or touching the patient's equipment at the dialysis station.[2] Only 44% of the community-based units indicated that this recommendation was followed. Both Health Canada (Routine Practice) and the CDC (Standard Precautions) guidelines recommend that a gown be worn to prevent soiling of clothing during procedures and patient care activities likely to generate splashes or sprays of blood.[12,13] Table 24 shows that a low percentage of the adult units reported following the recommended use of gowns as a routine procedure when caring for a hemodialysis patient.

Table 22. Antiseptic techniques chosen when accessing the CVC

	In-centre units (n= 50)	Pediatric units (n=6)	Community based units (n=32)
Use Sterile Gloves	22 (44%)	4 (66%)	17 (53%)
Use Clean Gloves	28 (56%)	2 (33%)	15 (47%)
Mask worn by health care provider	42 (84%)	5 (83%)	30 (94%)

Table 23. Hemodialysis patient screened for Staphylococcus aureus carriage prior to vascular access intervention

	In-centre units (n= 50)	Pediatric units (n=6)	Community based units (n=32)
Prior to CVC placement	5 (10%)	0	3 (9%)
Prior to guide wire exchange	4 (8%)	0	3 (9%)
Prior to arteriovenous access creation	5 (10%)	0	3 (9%)

Table 24. Personal protective equipment chosen by Healthcare Provider

	In-centre units (n= 50)	Pediatric units (n=6)	Community based units (n=32)
Follows CDC guidelines for glove use	37 (74%)	5 (83%)	14 (44%)
Gown worn by health care provider for dialysis put-on and take-off	7 (14%)	4 (66%)	2 (6%)

Cleaning and disinfection

While Health Canada has published guidelines on cleaning, disinfection and sterilization for general application, CDC provides specific recommendation regarding cleaning and disinfection of surfaces and equipment in the hemodialysis units.[2,24] Tables 25 and 26 summarize the reported agents used for environmental surface cleaning and disinfection, and the internal and external disinfection of the hemodialysis machines within the hemodialysis units surveyed. Due to the nature of a hemodialysis unit, with its rapid and frequent patient turnover, the inherent host risk factors of the patient population such as frequent acute care stays, higher antibiotic exposure and antibiotic resistance, and the risk of blood splashes, all units surveyed reported adherence to recommendation using low level disinfection of the external machine and the patient care environment (Tables 25 and 26).

Although the internal disinfection of a machine is driven by the manufacturer's recommendations, the vast majority of respondents reported use of a chlorine-based product at some point during the disinfectant process (Table 26). There was a wide range of protocols involving the use of heat and cold sterilants as well as a range for the frequency of disinfection. Some units disinfected the machine between patients while others used a weekly regime combined with heat and/or a cold sterilant. It is not known if all machines were single-pass or re-circulating dialysis machines. With the exception of a few units (11%) the low level disinfectant used on the hemodialysis machine roughly correlated with agent chosen as the low level disinfectant for cleaning and disinfection of the hemodialysis unit environment.

In June 2004, Health Canada issued a notice to hemodialysis units regarding the potential for patient-to-patient cross contamination. Internal components of dialysis machines were reported as contaminated and may have been a result of faulty blood-lines and transducer protectors. Seventy-five of the 89 (84%) units possessed equipment that required a transducer protector. Sixty-nine of these 75 units (92%) indicated there was a protocol in place should there be a breech in the transducer, and 62/75 (83%) of the units had a protocol that involved decontamination of the dialysis machine. It was unclear in four responses whether or not the protocol included disinfection and three units indicated that the development of a protocol was underway.

Water treatment

Potable water must be subjected to a form of water treatment within the dialysis setting. Most hemodialysis units follow the chemical and microbiological standards of CSA (Canadian Standard's Association) and AAMI (American Association for the Advancement of Medical Instrumentation) to establish an in-house quality assurance program (Table 27). Both the CSA and AAMI recommend monthly bacterial counts, while only the CSA standards specify requirement of monthly endotoxin testing. AAMI recommendations suggest but do not specify monthly endotoxin testing.[25,26] All units surveyed comply with the CSA recommendation on monthly bacterial monitoring, but not on endotoxin testing (Table 27). The lack of lab resources may be one of the reasons for not able to follow the recommendation.

Hemodialysis waste (dialyzers and tubings)

AAMI offers guidelines to dialysis centres that wish to re-use dialysers although only two (4%) of the incentre units responded that the dialysers are reused (Table 28). This low figure does not correlate with the 2000 American data, which showed that 80% of 3,683 centres surveyed reported the reuse of dialysers.[8] Management of biomedical waste falls under provincial legislation and respondents should consult their appropriate Ministry guidelines. Table 29 shows reported management of hemodialysis waste by province. Some respondents indicated that the dialyser would be considered biohazardous but the tubing would not, in these cases the answer was defaulted to "handled as biohazardous" (Table 29).

Table 25. Low-level disinfectant used for environmental surface cleaning and disinfection

	In-centre units (n= 51)	Pediatric units (n=6)	Community based units (n=32)
Quaternary ammonium compound	24 (47%)	3 (50%)	13 (41%)
Chlorine based product (bleach)	7 (14%)	0	5 (16%)
Electrolytically produced chlorine based disinfectant	2 (4%)	1 (17%)	5 (16%)
Accelerated hydrogen peroxide product	15 (29%)	1 (17%)	9 (28%)
Other agent	3 (6%)	1 (17%)	0

(Note: due to rounding off, the % reported in the above table may not add up 100)

Table 26. Hemodialysis machine disinfection

	In-centre units (n= 51)	Pediatric units (n=6)	Community based units (n=32)
Internal disinfection involves using chlorine based product	39 (76%)	5 (83%)	14 (44%)
Internal disinfection involves using Electrolytically produced chlorine based disinfectant	14 (27%)	1 (16%)	20 (62%)
External low level disinfectant using chlorine based product	6 (12%)	3 (50%)	5 (16%)
External low level disinfectant using electrolytically produced chlorine based disinfectant	6 (12%)	1 (16%)	8 (25%)
External low level disinfectant using quaternary ammonium compound	21 (41%)	0	12 (37%)
External low level disinfectant using accelerated hydrogen peroxide product	15 (29%)	2 (33%)	8 (25%)
External low level disinfectant using other agents	3 (6%)	0	0

(Note. Some units report using more than one agent)

Table 27. Hemodialysis water quality assurance

	In-centre units (n= 51)	Pediatric units (n=6)	Community based units (n=32)
Water monitored by bacterial count	51 (100%)	6 (100%)	32 (100%)
Bacterial count done at least monthly	51 (100%)	6 (100%)	32 (100%)
Water monitored by endotoxin testing	31 (61%)	4 (66%)	8 (25%)
Endotoxin testing done at least monthly	29 (57%)	4 (66%)	6 (19%)

Table 28. Management of used dialyzers and dialysis tubings

	In-centre units (n= 51)	Pediatric units (n=6)	Community based units (n=32)
Participates in dialyser reuse program	2 (4%)	0	0
Tubing/dialyser handled as biohazardous waste	31 (61%)	5 (83%)	23 (72%)

Table 29. Management of Hemodialysis waste, by province

	Tubing and/or dialyser handled as biohazardous waste.
Alberta	25 of 26 units
British Columbia	7 of 7 units
Manitoba	0 of 1 unit
New Brunswick	2 of 3 units
New Foundland	0 of 1 unit
Nova Scotia	2 of 3 units
Northwest Territory	2 of 2 units
Ontario	11 of 33 units
Quebec	10 of 12 units
Saskatchewan	1 of 1 units

CONCLUSIONS

Since the intent was to request the respondent act as an informant on practice within their hemodialysis unit, a mail questionnaire was selected as the most cost effective option for conducting this survey. It permits the respondent to consult with other persons or records before responding so more complete information can be obtained. A reminder about the questionnaire was sent via e-mail to all potential participants but participation in the survey did not increase significantly. Albeit additional time and cost, perhaps a personal telephone invitation at this point may serve as a more effective reminder.

Although the open-ended questions posted in this survey presented a challenge in the analysis of data, valuable insights were gained by using them. The additional information collected will be useful in the future to refine existing questions and to formulate further questions. For future questionnaires requesting in-depth information, we suggest using the close-ended question design to facilitate data analysis.

Wording in some of the questions failed to deliver clear meaning to the respondents. As a consequence, time-consuming telephone and e-mail follow-ups were necessary in order to clarify or validate the answers provided. In future survey, we suggest to include explanatory notes and definitions to improve communication.

Some of the questions included in the survey could not be analyzed due to poor response. These items were not commented on in this report. For future surveys seeking in-depth information on practice and statistical data, we would recommend that part of the questionnaire be forwarded to personnel, such as the nephrologists, the vascular access nurses, the dialysis machine technicians and the infection control practitioners who are most knowledgeable in that particular subject matter to ensure accurate and complete response. This comprehensive survey provides a good general understanding of the practices within the Canadian hemodialysis units and provides a basis for developing Canadian standards and guidelines for practice. Among the respondents, some infection control practitioners commented the survey questionnaire has presented them the opportunity to learn more about operations within their own hemodialysis units.

Others remarked that the questionnaire prompted them to consider hypothetical situations and to examine current practice and plan strategies.

In conclusion, this survey meets its objective in providing preliminary information for hemodialysis units to compare own practice with the polled practice. Insights gained from the survey will be used to develop further questions to gather additional in-depth information. The questionnaire will be modified and repeated in future to provide information on trends and changes within Canadian hemodialysis units.

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continued on page 136

Appendix A. Schedule of MRSA and VRE prevalence screenings reported by in-centre units and pediatric units.

	In-centre units		Pediatric units	
	MRSA prevalence screening (n=29)	VRE prevalence screening (n=27)	MRSA prevalence screening (n=3)	VRE prevalence screening (n=2)
Per 12 months	10 (35%)	10 (37%)	0	0
Per 6 months	13 (45%)	15 (56%)	2 (67%)	2 (100%)
Per 4 months	1 (3%)	1 (3.5%)	0	0
Per 1 month	4 (14%)	1 (3.5%)	1 (33%)	0
Schedule not provided	1 (3%)	0	0	0

Appendix B. MRSA decolonization and follow-up screening protocols, reported in variations of 5-day, 7-day, 10-day and 14-day regimen

Protocol	MRSA decolonization regimen	Post-decolonization screening
1. QC	Mupirocin tid x 5 days. (Screening sites not mentioned.)	Screen weekly. (Screening sites not mentioned.)
2. SK	Mupirocin bid x 5 days to nares. If ineffective, repeat regimen once.	Requires a total of 3 sets of consecutive negatives screenings one week apart. The first screening starts 72hrs post completion of decolonization regimen. (Screening sites not mentioned.)
3. ON	Mupirocin bid x 5 days to nares. If ineffective, repeat regimen. If still ineffective, repeat regimen and add Rifampin 600mg qd x 7 days.	Screen nasal monthly post completion of decolonization.
4. QC	Mupirocin x 5 days. CHG bath qd x 7 days. (Screening sites, mupirocin schedule nor % CHG used not mentioned).	The first screening starts 1-month post completion of decolonization regimen. (Screening sites not mentioned. No additional information provided)
5. ON	Mupurocin tid x 7days to nares. If ineffective, repeat regimen.	Requires a total of 3 sets of consecutive negatives nasal screenings one week apart. The first screening starts 72hrs post completion of decolonization regimen.
6. BC	Mupurocin tid x 7days to nares and other applicable wound/device insertion sites. 2% CHG total body wash qd x 7 days.	Screenings include nares, groin and if applicable, wound/device insertion sites. Requires a total of 3 sets of negative screenings 48hrs apart. The first screening starts 48hrs post completion of decolonization regimen.
7. ON	Mupirocin bid x 7 days to nares. 2% CHG bath qd x 7 days.	Screen nasal weekly x 3 weeks post completion of decolonization regimen. Repeat screening monthly x 3 months.
8. ON	Mupirocin tid x 7 days to affected areas until evidence of culture negative for MRSA. CHG total body wash qd x 7 days. (% CHG used not mentioned)	Screenings include any affected areas. Requires a total of 3 sets of consecutive negatives screenings one week apart.
9. ON	Mupurocin tid x 7days to nares and affected areas. Triclosan bath qd x 7 days. Triclosan shampoo twice a week x 7 days.	Information not provided.
10. MB	Mupirocin bid x 7days to nares and other applicable wound/device insertion sites. 2-4% CHG bath qd x 7 days. If rectal colonized, add antibiotic to which the organism is sensitive, add Rifampin 300 mg po bid x 10 days. If ineffective, repeat regimen for 10 days, add antibiotic to which the organism is sensitive and add Rifampin 300mg po bid x 10 days.	Screenings include throat, nares, rectal and if applicable, wound/device insertion sites. Requires 5 sets of consecutive negative screenings one week apart. The first screening starts one-week post completion of decolonization regimen.
11. NB	Mupirocin tid x 7 days to nares. 4% CHG total body wash qd x 7 days. Rifampin 300mg po bid x 7 days. Septra DS bid x 7 days.	Screenings include nares, rectal, and if applicable urine, wound/device insertion sites. Requires a total of 3 sets of consecutive negatives screenings one week apart. The first screening starts one-week post completion of decolonization regimen.
12. ON	Mupurocin tid x 7days to nares and other applicable wound/device insertion sites. 2% CHG bath qd x 7 days. If ineffective, repeat regimen and add Rifampin and Septra (dosage and schedule not mentioned).	Screenings include nares and if applicable, wound/device insertion sites. Requires a total of 3 sets of negative screenings 1 week apart. The first screening starts 48hrs post completion of decolonization regimen.
13. ON	Mupurocin tid x 7days to nares and open wounds. 0.05% CHG qd x 7 days to clean open wound/device insertion sites. 2% CHG bath qd x 7 days. Systemic antibiotics used where indicated, including Vancomycin 1gm IV x 1 dose, Rifampin and Fusidic acid.	Screenings include nares, groin rectum and if applicable, wound/device insertion sites. Requires a total of 3 sets of negative screenings 1 week apart. The first screening starts 48hrs post completion of decolonization regimen.
14. ON	Mupirocin x 7 days to nares and if applicable, wounds/device insertion sites. Rifampin 300mg po bid x 7 days with either Doxycycline 100mg po bid x 7 days or Septra DS bid x 7 days. (Mupirocin schedule not mentioned)	Screen monthly. (Screening sites not mentioned.)
15. ON	Mupirocin tid x 7 days to nares and superficial sites. 2% CHG bath qd x 7 days. If infected wound present, add antibiotic treatment. Patient with open ulcers are decolonized at least once. CVC lines are changed if antibiotic treatment fails.	Screenings include all affected sites. Requires a total of 3 sets of negative screenings 1 week apart. If patient is not on Vancomycin, the first screening starts 48hrs post completion of decolonization regimen. If patient is on Vancomycin, the first screening starts 7 days post completion of Vancomycin. Repeat screenings every 1-3 months.
16. ON	Mupirocin bid x 10 days. (Screening sites not mentioned.)	Requires a total of 3 sets of consecutive negatives screenings one week apart. The first screening starts 48hrs post completion of decolonization regimen. (Screening sites not mentioned.)
17. QC	Mupirocin bid x 10 days (for all Staphylococus aureus) (Screening sites not mentioned.)	Screen per routine screening monthly. (Screening sites not mentioned.)
18. NS	Mupirocin x 10 days to nares. CHG bath qd x 10 days. (Mupirocin schedule and % CHG used not mentioned)	Requires a total of 3 sets of negative screenings 48hrs apart. The first screening starts 48hrs post completion of decolonization regimen. Repeat screening at 6 months and 12 months. (Screening sites not mentioned.)
19. QC	Mupirocin bid x 10 days to nares. CHG (% used not mentioned) bath qd x 10 days. Rifampin and Septra po x 10 days (dosage and schedule not mentioned).	Screenings include nares, perianal, and if applicable, wound/device insertion sites. Requires a total of 3 sets of consecutive negatives screenings one week apart.
20. QC	For nasal colonization only, Mupirocin bid x 10 days to nares. 3% Hexachlorophene shower/bath qd x 10 days. If nasal and other sites are colonized, add Rifampin 600mg po qd x 10 days and Septra po bid x 10 days.	Requires all sets of screenings negative, at Day1, Day3, Day7 and Day10 post completion of decolonization regimen. Repeat screening monthly. (Screening sites not mentioned.)
21. NB	Mupirocin bid x 14 days to nares. 4% CHG bath qd x 14 days. Two oral antibiotics the organism is sensitive x 14 days.	Requires a total of 3 sets of consecutive negatives screenings one week apart. The first screening starts one-week post completion of decolonization regimen. (Screening sites not mentioned.)
22. NB	Mupirocin bid x 14 days to nares. CHG (% used not mentioned) bath qd x 14 days. Oral antibiotics x 14 days (agent, dosage and schedule not mentioned).	Screen nasal monthly post completion of decolonization regimen.

(Note: CHG = chlorhexidine gluconate)

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03470	**FeelFresh**™ Hand Sanitizing Spray Cartridge	-	6 x 300 mL	5.0	0.2

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CODE	DESCRIPTION	DIMENSIONS	WEIGHT (lbs.)	CUBIC (FT)
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Virox Technologies partnership scholarship

Through the financial support of the Virox Technologies Partnership, 13 CHICA-Canada members were awarded scholarships to attend the 2005 National Education Conference in Winnipeg, CHICA-Canada and its members thank Virox Technologies and their partners for their initiative to make the national education conference accessible to those who may not have otherwise been able to attend.

Applications for the 2006 Scholarship are to be submitted in writing to the Secretary/Membership Director of CHICA-Canada no later than **Jan. 31, 2006**. Please mail applications to CHICA-Canada, PO Box 46125 RPO Westdale, Winnipeg MB R3R 3S3, fax to 1-204-895-9595, or email to *chicacanada@mts.net*.

For more information and the application form, visit the CHICA-Canada website at *www.chica.org* or the Virox website at *www.virox.com*, or contact CHICA-Canada.

2005 Scholarship Winners

Richard Bedard
Nancy Brown
Yasmine Chagla
Joanne Dow
Margie Foster
Linda Howard
Sharon Kelly
Alice Newman
Jacqueline (Jackie) Ratzlaff
Pamela Siddall
Merlee Steele-Rodway
Linda Stoddart
Marion Yetman

NEW PRODUCT – CHICA-CANADA INFECTION CONTROL AUDIT TOOLKIT

The Infection Control Audit Toolkit is intended to be a resource that provides templates for infection control audits that you can use in your practice. The audits were designed by CHICA-Canada members to be used in a variety of health care settings. All audits have been reviewed by the CHICA-Canada Standards and Guidelines committee and are provided with permission from the developers.

To date, there are 11 audits that have been submitted and reviewed. We encourage you to send any additional audits that you have developed for use in your facility. Permission to use the audits must be provided in writing from the developer(s) and/or facility.

The audits currently include:
- Dental Audit Form
- Endoscopy Audit
- Hemodialysis Unit Audit
- High Level Disinfection – Outside SPD Audit
- Infection Prevention and Control Risk Assessment Guide
- Hospital-wide Infection Control and Prevention Audit and Template
- Opthalmology O.R. Cluster Investigation and Procedure Assessment
- O.R. Audit
- Patient/Resident Service Units Audit
- Renal Unit Infection Control Audit Form
- Respiratory Outbreaks in Long Term Care Facilities Audit

An update to the Toolkit will provided for the first year **at no additional charge.**

Contact the CHICA-Canada office to order or see page 86 of the summer issue for order form.

CHICA-CANADA INFECTION CONTROL AUDIT TOOLKIT PRE-ORDER INFORMATION - Publication Date: June 30, 2005

	MEMBER (ordered after 2005 Conference)	**NON-MEMBER** (ordered after 2005 Conference
Audit Toolkit	$ 120.00	$ 170.00
Shipping & handling	1 kit - $10 2 kits - $15 3 or more - $20	1 kit - $10 2 kits -$15 3 or more - $20
GST	GST – 7% HST – 15%	GST - 7% HST – 15%
TOTAL	=$130.00-150.00	=$180.00-210.00
New Audits – Year 1	N/C	N/C
New Audits – Year 2	$10.00 per audit	$15.00 per audit

Infection Control Professionals: Partners in Prevention!

National Infection Control Week - October 17 to October 21, 2005

Every year brings new challenges to our health care system. Indeed the challenges of preventing infections are numerous in the face of increasing globalization and newly emerging infectious diseases.

New threats such as avian and pandemic influenza and old familiar ones such as *C. difficile* and MRSA are providing new challenges and require continuous diligence for their prevention and control.

The practice of infection prevention pervades virtually every aspect of public and community health. The role of infection prevention has never been more critical--it is therefore vitally important that we continually reshape our responses to such challenges.

Infection Control Professionals are working to bridge the gaps between hospitals and the community, health care providers and the public. We are all partners in the prevention and control of communicable diseases.

Incorporating infection prevention and control measures into our daily lives is the key. Hand hygiene, the appropriate use of protective barriers and immunization are three cornerstones in prevention. These measures and other strategies are part of a weeklong campaign sponsored by the Community and Hospital Infection Control Association of Canada.

"Infection Control Professionals: Partners in Prevention!" is the theme of this year's National Infection Control Week, October 17 to October 21, 2005, as proclaimed in the House of Commons. CHICA-Canada is a national organization comprised of 19 regional chapters providing a forum for information sharing and the development of improved practices in infection prevention and control.

Infection prevention… don't take our health for granted

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Ecolab Poster Contest

An Annual Poster Contest is sponsored by Ecolab and supported by a Chapter of CHICA–Canada to give ICPs an opportunity to put their creative talents to work in developing a poster which visualizes the Infection Control Week Theme.

The winner of the Annual Poster Contest is announced at the annual CHICA-Canada Conference. Winners receive full registration at the next CHICA–Canada conference.

You are invited to design a poster that will be used for **Infection Control Week 2006** using the following theme:

"Infection Prevention: Planning for tomorrow"

- Your entry should be informative, eye-catching and applicable to both healthcare and community settings.
- Your entry will be judged on overall content.
- Artistic talent is helpful but not necessary.
- The winning entry will be submitted to a graphic designer for final production.
- Your entry will become the property of CHICA–Canada.

Deadline Date: January 27, 2006

Send submissions to: Director of Programs and Projects, c/o CHICA–Canada PO Box 46125 RPO Westdale, Winnipeg MB R3R 3S3. Courier address: 67 Bergman Cresent, Winnipeg MB R3R 1Y9 Fax: 204-895-9595 E-mail: *chicacanada@mts.net*. Include your name, address and phone number on the back of your entry.

GRAND PRIZE:

Full registration at the 2006 CHICA–Canada National Education Conference in London, Ontario. No limit to number of entries, so enter often!

HOST CHAPTER 2006:

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3M Canada Infection Prevention Research Grant

As part of an ongoing initiative to promote innovative infection control and prevention practices in Canadian healthcare, 3M Canada has created a research grant through its 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.

One research grant of $6,000 to the Principal Investigator of the successful application will be presented at the 2006 CHICA–Canada National Education Conference (London, Ontario - May, 2006) (travel, accommodations and meals will be provided by 3M Canada Company for the successful recipient).

An application form will be available at www.chica.org on November 1, 2005. Deadline date for applications: March 1, 2006. Applications must be sent to:

Secretary/Membership Director
CHICA-Canada
PO Box 46125 RPO Westdale
Winnipeg MB R3R 3S3

Or courier to:
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For Active Immunization against Tetanus, Diphtheria and Whooping Cough
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INDICATIONS AND CLINICAL USE

ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine] is indicated for the prevention of tetanus, diphtheria and whooping cough in adolescents and adults aged 11 to 64 years. ADACEL® may be administered concurrently with a dose of Hepatitis B vaccine in 11 and 12 year-olds at separate sites with separate syringes.[1] Because simultaneous administration of common vaccines is not known to affect the efficacy or safety of any of the routine recommended vaccines, if return of a patient for further immunization is doubtful, simultaneous administration of all vaccines appropriate for age and previous vaccination status (excluding IPV, MMR) at separate sites with separate syringes is indicated.[1] Vaccines containing acellular pertussis may be administered simultaneously with other inactivated and live vaccines at different sites.[1]
HIV-infected persons, both asymptomatic and symptomatic, should be immunized against diphtheria, pertussis and tetanus according to standard schedules.[1] Persons who have had tetanus or diphtheria should still be immunized since these clinical infections do not always confer immunity.[1] Those who have had natural pertussis can continue to receive pertussis-containing vaccines.[1,2]

CONTRAINDICATIONS

General Immunization with ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine] should be deferred in the presence of any acute illness, including febrile illness to avoid superimposing adverse effects from the vaccine on the underlying illness or mistakenly identifying a manifestation of the underlying illness as a complication of vaccine use. A minor illness such as mild upper respiratory infection is not reason to defer immunization.[1]

Absolute Contraindications
Allergy to any component of ADACEL® or an anaphylactic or other allergic reaction to a previous dose of Td Adsorbed or another component pertussis combination vaccine are contraindications to vaccination.

WARNINGS

Intramuscular injections should be given with care in patients suffering from coagulation disorders or on anticoagulant therapy because of the risk of hemorrhage.[1] ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine] should not be administered into the buttocks due to the varying amount of fatty tissue in this region, nor by the intradermal route, since these methods of administration may produce a weaker immune response. Immunocompromised persons (whether from disease or treatment) may not obtain the expected immune response.[1] If possible, consideration should be given to delaying vaccination until after the completion of any immunosuppressive treatment.[1] The use of fractional doses in an attempt to reduce the severity of adverse reactions cannot be recommended because there is insufficient evidence on the safety or efficacy of such smaller doses.[1,3] As with any vaccine, immunization with ADACEL® may not protect 100% of susceptible persons.

PRECAUTIONS

General For instructions on recognition and treatment of anaphylactic reactions see the current edition of the Canadian Immunization Guide or visit the Health Canada website. The possibility of allergic reactions in persons sensitive to components of the vaccine should be evaluated. Epinephrine Hydrochloride Solution (1:1,000) and other appropriate agents should be available for immediate use in case an anaphylactic or acute hypersensitivity reaction occurs.[1] Health-care providers should be familiar with current recommendations for the initial management of anaphylaxis in non-hospital settings, including proper airway management.[1] Before administration, take all appropriate precautions to prevent adverse reactions. This includes a review of the patient's history concerning possible hypersensitivity to the vaccine or similar vaccine, previous immunization history, the presence of any contraindications to immunization, and current health status. It is extremely important when a patient returns for the next dose in the series that the patient, parent or guardian should be questioned concerning any symptoms and/or signs of an adverse reaction after the previous dose of vaccine. (See CONTRAINDICATIONS and ADVERSE REACTIONS.) Frequent booster doses of tetanus or diphtheria toxoids in the presence of adequate or excessive serum levels of tetanus or diphtheria antitoxins have been associated with increased incidence and severity of reactions and should be avoided. Do not inject into a blood vessel.

Caution Use a separate sterile needle and syringe, or a sterile disposable unit, for each individual patient to prevent disease transmission. Needles should not be recapped and should be disposed of properly. Before administration of ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine] health-care providers should inform the patient or parent or guardian of the patient to be immunized of the benefits and risks of immunization, inquire about the recent health status of the patient and comply with any local requirements with respect to information to be provided to the patient before immunization.

Pregnancy and Lactation The effect of ADACEL® on the development of the embryo and fetus has not been appraised. Vaccination in pregnancy is not recommended unless there is a definite risk of acquiring pertussis. As the vaccine is inactivated, any risk to the embryo or the fetus is highly improbable. The benefits versus the risks of administering ADACEL® in pregnancy should carefully be evaluated when there is a high probable risk of exposure to a household contact or during an outbreak in the community. The effect of administration of ADACEL® during lactation has not been assessed. As ADACEL® is inactivated, any risks to the mother or the infant is highly improbable. The benefits versus the risks of administering ADACEL® during lactation should carefully be evaluated by the health-care provider, particularly where there is a high probable risk of disease transmission through exposure to a household contact, or during an outbreak in the community. The risks of disease transmission from the infected mother to the infant who may not have been fully immunized should also be evaluated.

ADVERSE REACTIONS

In a clinical trial with 749 adolescents and adults given ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine] (n = 449) or Td Adsorbed (n = 151), adverse events following ADACEL® were primarily localized to the site of injection. Pain was the most common local reaction (88.6%), while erythema and swelling were reported in 11.8% and 16.7%, respectively. These local adverse events were generally mild and transient in duration. Systemic adverse events that were reported after vaccination with ADACEL® were: fever (9.4%), vomiting (2.4%), headache (38.8%), diarrhea (10.2%), nausea (14.7%), chills (12.5%), generalized bodyache (20.0%), decreased energy (29.4%) and sore or swollen joints (9.1%). Of the 39.8% that reported headaches, 72.9% were mild and less than 5% were categorized as severe by the vaccinee. While decreased energy was common (29.4%), only 0.9% of vaccinees considered it as significant. The adverse event rates observed with ADACEL® were comparable to those seen with the group that received Td Adsorbed (Table 1).[1]

TABLE 1: RATE (%) OF ADVERSE EVENTS REPORTED AFTER VACCINATION WITH ADACEL® COMPARED TO Td ADSORBED[1]

Adverse Events	Severity	Adverse Event Rate %	
		ADACEL®	Td Adsorbed
Local			
Pain	Any	88.6	88.7
	Severe	0.4	0.7
Swelling	Any	16.7	16.6
	Severe	10.3	8.7
Redness	Any	11.8	6.6
	Severe	3.3	2.0
Systemic			
Headache	Any	38.8	35.8
	Severe	1.8	0.7
Fever	Any	9.4	6.0
	Severe	0	0
Decreased Energy	Any	29.4	27.8
	Severe	2.2	2.0
Bodyache	Any	20.0	13.9
	Severe	1.1	0
Chills	Any	12.5	5.3
	Severe	0.7	0.7
Nausea	Any	14.7	11.3
	Severe	0.9	0
Diarrhea	Any	10.0	11.3
	Severe	0.2	0.7
Sore Joints	Any	9.1	8.6
	Severe	0.4	0
Vomiting	Any	2.4	0.7
	Severe	0.9	0

In a separate clinical trial with 2958 adolescents aged 11 and 12 years-old, ADACEL® was shown to have a safety profile that was comparable to that seen in the first trial in older adolescents. In addition, when ADACEL® was administered concomitantly with a dose of Hepatitis B vaccine, the adverse events rates were not affected. Localized reactions consisting of discomfort, pain, swelling and redness at the injection site may be associated with tetanus and diphtheria toxoids.[1,4] Following booster doses, local erythema and swelling are not uncommon and Arthus type sensitivity may occur.[1] Severe local reactions are often associated with high levels of circulating antitoxin, usually resulting from over-immunization due to booster being given too frequently.[1,4,5]
Very rarely, large local reactions, consisting of redness and/or swelling >30cm, some with circumferential swelling of the injected limb, have been reported following the fourth and fifth pediatric doses of acellular pertussis-containing vaccine. These local reactions are usually not associated with significant pain and resolve spontaneously. Systemic reactions, such as generalized urticaria, are uncommon. Influenza like symptoms have been reported and usually occur within 12 hours of vaccination with some diphtheria and tetanus toxoids.[1] Neurological complications such as peripheral neuropathies[1,6,7] and demyelinating diseases of the central nervous system (CNS)[1] following tetanus toxoid or diphtheria toxoid have been documented but are rare.[1,8] The U.S. Institute of Medicine has concluded that the evidence is inadequate to accept or reject a causal relation between tetanus toxoid, DT or Td and demyelinating diseases of the CNS (acute disseminating encephalomyelitis, transverse myelitis, optic neuritis) or peripheral neuroencephalitis (other than those caused by direct intramental injections).[1] The following neurologic illnesses have been reported as temporally associated with some vaccines containing tetanus toxoid: neurological complications[1,9] including brachial lesion,[1] brachial plexus neuropathies,[1,10] paralysis of the radial nerve,[1] paralysis of the recurrent nerve,[1] accommodation paresis, and EEG disturbances with encephalopathy (with or without permanent intellectual and/or motor function impairment).[1] In the differential diagnosis of polyradiculoneuropathies following administration of a vaccine containing tetanus toxoid, tetanus toxoid should be considered as a possible etiology.[1,11] The Institute of Medicine concluded that the evidence favours acceptance of a causal relation between tetanus toxoid and brachial neuritis.[1]
On the basis of a case report and evidence that a vaccine-induced immunologic response can cause Guillain-Barré Syndrome (GBS), the Institute of Medicine concluded that tetanus toxoid-containing vaccines can trigger GBS in adults. No increased risk for GBS has been observed with the use of DPT in children.[1,12] Persistent nodules at the site of injection have occurred following the use of an adsorbed product, but this complication is unusual,[1] and may be related to subcutaneous administration.[1] Sterile abscess at the site of injection has been reported following use of some adsorbed vaccines (6 - 10 per million doses).[1] Rare cases of allergic or anaphylactic reaction (i.e., hives, swelling of the mouth, difficulty breathing, hypotension, or shock) have been reported after receiving some preparations containing diphtheria, tetanus and/or pertussis antigens.[1] Death following vaccine-caused anaphylaxis has been reported.[1] As with any vaccine, there is the possibility that broad use of the vaccine could reveal rare adverse reactions not observed in clinical trials. Physicians, nurses, and pharmacists should report any adverse occurrences temporally related to the administration of the product in accordance with local requirements and to the Senior Product Safety Officer, Pharmacovigilance Department, Sanofi Pasteur Limited, 1755 Steeles Avenue West, Toronto, ON, M2R 3T4 Canada, 1-888-621-1148 (phone) or 416-667-2435 (fax).

DOSAGE AND ADMINISTRATION

For persons who have previously been immunized against tetanus, diphtheria, and pertussis a dose of 0.5 mL should be administered as a reinforcing dose. There are currently no data upon which to base a recommendation for the optimal interval for administering subsequent booster doses with ADACEL® [Tetanus and Diphtheria Toxoids Adsorbed Combined with Component Pertussis Vaccine].

Tetanus Prophylaxis in Wound Management[1]
The table below summarizes the recommended use of immunizing agents in wound management.

History of tetanus immunization	Clean, minor wounds		All other wounds	
	Td*	TIG†	Td	TIG
Uncertain or <3 doses of an immunization series**	Yes	No	Yes	Yes
≥3 doses recieved in immunization series**	No‡	No	No§	No¶

*Adult type tetanus and diphtheria toxoids. If the patient is <7 years old, a tetanus toxoid-containing vaccine such as QUADRACEL® or PENTACEL® is given as part of the routine childhood immunization.
**Primary immunization is at least 3 doses at age appropriate intervals.
† Tetanus immune globulin, given at a separate site from Td.
‡ Yes, if >10 years since last booster.
§ Yes, if >5 years since last booster. More frequent boosters not required and can be associated with increased adverse events. The bivalent toxoid, Td, is not considered to be significantly more reactogenic than T alone and is recommended for use in this circumstance. The patient should be informed Td has been given.
¶Yes, if individuals are known to have a significant humoral immune deficiency state (e.g., HIV, agammaglobulinemia) since immune response to tetanus toxoid may be suboptimal.

It is important to ascertain the number of doses of tetanus toxoid previously given and the interval since the last dose. When a tetanus booster dose is required, a combined preparation of tetanus and diphtheria toxoid formulated for adults (Td) is preferred. Appropriate cleansing and debridement of the wound is imperative, and use of antibiotics may be considered. For individuals planning to travel to developing countries, it may be prudent to offer an early tetanus booster, prior to travel if more than 5 years have elapsed since the last dose.

ADMINISTRATION

Inspect for extraneous particulate matter and/or discolouration before use. If these conditions exist, the product should not be administered. For information on vaccine administration see the current edition of the Canadian Immunization Guide or visit Health Canada's website, SHAKE THE VIAL WELL to distribute uniformly the suspension before withdrawing each dose. When administering a dose from a stoppered vial, do not remove either the stopper or the metal seal holding it in place. Aseptic technique must be used for withdrawal of each dose. (See PRECAUTIONS.) Before injection, the skin over the site to be injected should be cleansed with a suitable germicide. Administer the vaccine **intramuscularly**. The preferred site is into the deltoid muscle. After insertion of the needle, aspirate to ensure that the needle has not entered a blood vessel. **DO NOT INJECT INTRAVENOUSLY.** Needles should not be recapped and should be disposed of properly. Give the patient a permanent personal immunization record. In addition, it is essential that the physician or nurse record the immunization history in the permanent medical record of each patient. This permanent office record should contain the name of the vaccine, date given, dose, manufacturer and lot number.

STABILITY AND STORAGE

Store at 2° to 8°C (35° to 46°F). DO NOT FREEZE. Discard product if exposed to freezing.
Do not use after expiration date.

AVAILABILITY OF DOSAGE FORMS

Vial 1 x 0.5 mL (Single Dose)
Vial 5 x 0.5 mL (Single Dose)

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Product information as of September 2002.

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2006 NATIONAL EDUCATION CONFERENCE
"BRIDGING GLOBAL PARTNERSHIPS"
London, Ontario – May 6-10, 2006

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IMPORTANT DATES TO REMEMBER

January 27, 2006	Deadline for submission of Abstracts
January 31, 2006	Deadline for application to Virox Partnership Scholarship
April 3, 2006	Deadline for reservations at Delta Winnipeg
April 17, 2006	Early Bird Registration Deadline
May 10, 2006	CHICA-Canada AGM and Town Hall

Watch for the Registration brochure in January 2006

And watch the CHICA-Canada website for conference updates– www.chica.org

Keynote Speaker:
Stephen Lewis
Former Canadian Ambassador to the U.N., and Special Envoy for HIV/AIDS in Africa.

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Registration Fees (Plus GST – 118833201RT0001)

To April 17	Member	Non-Member
Novice ICP Day	$50.00	$75.00
PreConference – Half Day	$75.00	$100.00
PreConference – Full Day	$100.00	$150.00
Conference, not including PreConference Day or novice	$350.00	$450.00
Daily, not including PreConference Day, each day	$150.00	$200.00
Student, Daily, each day*	$75.00	$75.00
Silver[1], Daily, each day	$75.00	$75.00
After April 17		
Novice ICP Day	$50.00	$75.00
PreConference – Half Day	$100.00	$150.00
PreConference – Full Day	$200.00	$300.00
Conference, not including PreConference Day or novice	$450.00	$600.00
Daily, not including PreConference Day, each day	$200.00	$300.00
Student, Daily, each day*	$75.00	$75.00
Silver[1], Daily, each day	$75.00	$75.00

*Registration must be accompanied by a letter of attestation by the teaching institution that the applicant is a full time student in a field related to infection control.
[1] Retired and not seeking employment in infection control.

Fees include Continental Breakfast (Sunday, Monday, Tuesday, Wednesday), Lunch (Sunday, Monday and Tuesday)
President's Reception, Sunday, May 7, included in registration. Non-registered guests: $25.00 per person, plus GST.
Gala Anniversary Celebration, Tuesday, May 9. Not included in registration. $75.00 per person, plus GST

Cancellation Policy

Cancellation request must be submitted in writing. Those received by March 17, 2006 – 70% refund; those received by April 7, 2006 – 50% refund; those received after April 7, 2006 cannot be refunded. Registrations may be transferred **at any time without penalty.**

Conference Hotel

Hilton London
300 King Street
London ON N6B 1S2
Website: *http://www.londonontario.hilton.com*

Telephone: 1-800-210-9336
or 1-519-439-1661
or – 1-800-HILTONS (445-8667)

Room Rate: $149.00 single/double (plus 12% taxes)
Deadline for reservations: April 3, 2006

EXHIBIT AND SPONSORSHIP OPPORTUNITIES

An Industry Showcase will be held to give attendees the opportunity for further knowledge and education through viewing and discussion of products and services in the field of infection prevention and control. Exhibit Information packages will be available in the Fall of 2005. Booth Rentals are $1,750 each (8'x10' booth) plus GST.

Guidelines for Sponsorship of the conference are available from CHICA-Canada. Sponsors of the conference benefit from additional promotion of their company as well as direct benefits through discounted booth fees, complimentary registration, and the opportunity to hold a Mini Symposium with specific product information. For more information, contact CHICA-Canada.

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- *Efficace contre les bactéries Gram positif et Gram négatif (y compris le SARM et l'ERV) et contre les champignons.*
- *Contient 0,5 % de chloroxylène pour une action désinfectante persistante.*
- *Enlève les débris et la saleté.*
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CALL FOR ABSTRACTS

Deadline for submission: January 27, 2006

Abstracts for presentation at the 2006 National Education Conference of the Community and Hospital Infection Control Association Canada will be accepted until the close of business January 27, 2006. The Abstract Committee reserves the right to select papers for presentation on the basis of relevance and interest, and to choose the types of presentation.

Abstract Preparation and Guidelines for Acceptance

A. Content

1. Abstracts should be based on results that have not or will not be published or presented before the meeting date.
2. The potential significance of the observations, as well as the scientific and/or educational quality of the work will influence which abstracts are accepted. Where possible, the author(s) should emphasize the features of the project that are new or different.
3. All concepts and abbreviations must be defined at first use in the body of the abstract.
4. Any corporate assistance must be acknowledged.
5. Any sources of funding must be acknowledged.

B. Format

Abstracts should be submitted in one of the following formats:

Format 1: This format is intended for abstracts involving the presentation of scientific research findings, such as those involving randomized clinical trials, case-control, observational or descriptive studies, or outbreak investigations where appropriate comparisons or analysis of data has been performed.
NOTE: The abstract should disclose primary findings and not include statements such as "experiment in progress" or "results will be discussed."

Abstract Title: (CAPITAL LETTERS)
Authors: The presenter must be denoted with an asterisk, e.g.: Rivers, T*, General Hospital, London, Ontario
Background/Objectives: Outline study objectives, the hypothesis to be tested, or description of the problem.
Methods: Report methods used or approach taken.
Results: Indicate essential results obtained in summary form with appropriate statistical analysis (p value, confidence intervals, odds ratio, etc.)
Conclusions: Provide a summary of findings as supported by results with implications and conclusions.

Format 2: The format is intended for abstracts involving the description of educational or performance improvement programs, observations, or other infection prevention activities, including descriptions of facility or community-based programs or interventions, discussions or infection prevention policy, and descriptions of a particular prevention model or method.

Abstract Title: (CAPITAL LETTERS)
Authors: (The presenter must be denoted with an asterisk, e.g. Sauvignon, C*, Shakespeare, W, General Hospital, London, Ontario
Issue: Identify the specific problems or needs addressed. Provide brief introduction of the proposed topic. Include important background and current information on issues.
Project: Description of the intervention/program
Results: Specific results in summary form.
Lessons Learned: Summary of the lessons learned and implications.

C. Major Interest (select one)

- ❑ Clinical Infectious Diseases
- ❑ Infection Prevention and Control

D. Subject Categories (select only one)

The author(s) should select the one subject category that best categorizes the submissions. This will assist conference planners in organizing the program. If the presenting author prefers a poster presentation, that preference must be indicated at the time of submission.

- ❑ Antimicrobial Resistance
- ❑ Ambulatory Care
- ❑ Antisepsis/Disinfection/Sterilization
- ❑ Cost Effectiveness
- ❑ Device Related Infections
- ❑ Emerging Pathogens
- ❑ HIV/AIDS/Hepatitis
- ❑ Home Care
- ❑ Infection Control Programs
- ❑ Infections in the Immunocompromised host
- ❑ Long-term care
- ❑ Molecular Epidemiology
- ❑ Occupational Health
- ❑ Outbreak Investigation
- ❑ Pediatrics
- ❑ Product Evaluation
- ❑ Quality/Process Improvement/Adverse Events
- ❑ Surveillance
- ❑ Site Specific Infections (SSI, Pneumonia, UTI, Bloodstream)
- ❑ Tuberculosis
- ❑ Other

E. Preferred method of Presentation if abstract selected (select one only)

- ❑ Poster
- ❑ Oral presentation
- ❑ No preference

F. Guidelines for Abstract Selection

Abstracts not meeting the stipulations outlined under both A(Content) and B (Format) above will not be considered for acceptance.

Submission of Abstracts

1. Emailed submissions are preferred. The file must be compatible with Word or WordPerfect for Windows. Email to chicacanada@mts.net.
2. Mailed submissions must consist of one paper copy plus a floppy disk or CDRom containing the abstract on a file compatible with Word or WordPerfect for Windows. Mail to 2006 National Education Conference, c/o CHICA-Canada, PO Box 46125 RPO Westdale, Winnipeg MB R3R 3S3. Courier deliveries to 67 Bergman Crescent, Winnipeg MB R3R 1Y9
3. Abstracts must be postmarked or received by email by January 27, 2006
4. Abstracts should be typed single spaced, of a finished size not more than 7" w x 6" h. Do not include borders in your submitted abstract. Indent the body of the abstract five spaces. Use no less than 10 and no more than 12 characters per inch.
5. Abstracts will be reproduced and submitted for inclusion in the pre-conference issue of the Canadian Journal of Infection Control. Presenters must be registered at the conference.
6. Include the following information with the abstract:
• Full name, professional mailing address, telephone and email address of the author who will present the paper.
• Preference: Oral Presentation, Poster Presentation, or No Preference
• Indicate if the presenter is a First-time Presenter.
• Indicate if the authors are interested in authoring an article for publication in either journal.


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Fresh tackles keyboard contamination

The average telephone carries over 25,000 microorganisms, while the average keyboard carries more than 3,200 per square inch. These organisms can live on surfaces for days or even months. Cleaning of these surfaces and devices is often overlooked. When cleaned, effective disinfection is often difficult. Hand washing is the best way to keep those bug numbers down, but some contamination is inevitable.

In response, Fresh Communications has recently introduced a line of single-use patient phones, and telephone and keyboard "gloves" that can be easily cleaned and disinfected. Other devices such as PDAs, cordless phones, cellular phones, tablets, cash registers and remote controls can have custom gloves made to fit, all of which allow for easier cleaning. All "gloves" are latex free.

Single-use phones, which can be purchased by the patient, eliminate ongoing telephone maintenance and replacement costs. Regular keyboard and phone "gloves" are easy to install and remove and they can be disinfected with any anti-bacterial spray. The covers also protect against spills, dirt, dust and other contaminants. Fresh maintains over 3,000 styles and models to fit most keyboards, laptops and phones.

Fresh has also introduced disposable covers for single-use requirements, which are geared for use within highly infected areas were products should be discarded after use, and a new range of non-porous rubber disinfectable keyboards and mouse, which are ideal for hospital and lab settings.

For information on the full range of products contact Fresh Communications at 905-426-9134 or e-mail *info@freshcommunications.ca*

Fresh communications

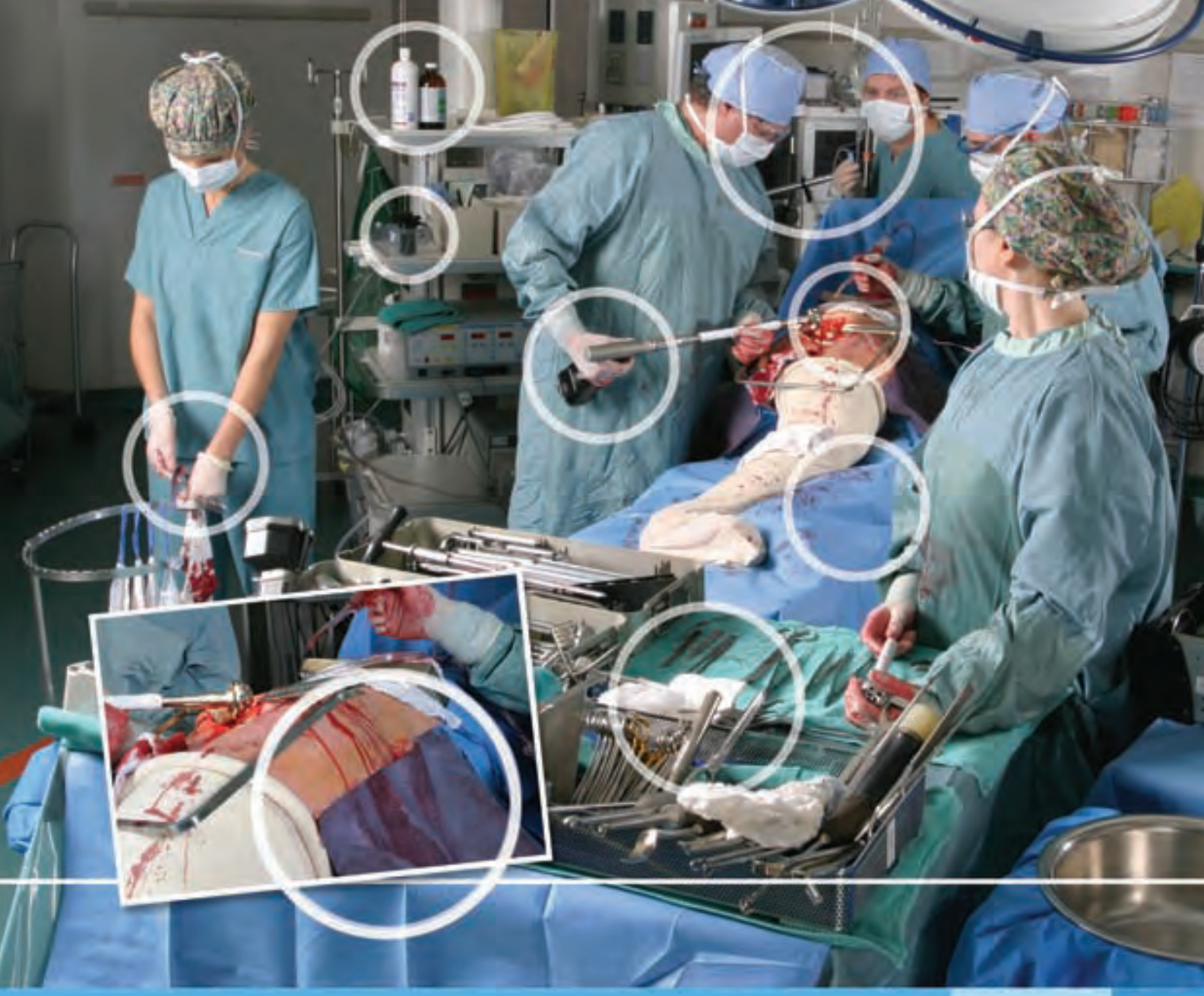
Microsan hand rub introduced by Deb Canada

Alcohol hand rubs and lotions are proving to be more effective at maintaining hand hygiene than simple handwashing alone. This fall, Deb Canada is launching Microsan, an instant foaming alcohol hand rub.

The product dispenses quick-breaking foam without the use of aerosols, an industry first. The product is dermatologist tested, dye and fragrance free and contains a broad-spectrum antimicrobial formula.

In addition to time saving and warding off infection, Microsan's moisturizers have received positive responses from those that have used the product in Canadian hospitals. Repeated handwashing can cause skin irritation in some healthcare providers, the foaming hand rub reduces irritation and dryness.

For more information on Microsan and Deb Canada visit the webite at *www.deb-canada.com* or call 888-DEB-SOAP (332-7672)



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