INSIDE:

Barriers and bridges to infection prevention and control on a surgical unit at a Netherlands hospital and a Canadian hospital: A comparative case study analysis

Why low pH does not necessarily mean skin irritancy

IPAC NEWS: Moira Walker Memorial Award for International Service
Disinfectants are the first line of defence against pathogens wanting to wage war on your healthcare facility. But is your disinfectant really providing you with the protection your patients and staff deserve? Consider the evidence:

• Some disinfectants promise disinfection in two minutes but are unable to attain the requisite wet dwell time to achieve compliance. If they dry too quickly, they’re simply not doing the job.

• Some disinfectants play the numbers game by including a long list of bactericidal and virucidal kill claims but often do not include important ones like Norovirus. If the claims are not relevant, you may not be killing what you need to.

• Some disinfectants claim to feel better or have pleasant scents but still require personal protective equipment. How effective are your disinfection outcomes if your staff are concerned about their safety?

“OMG! We think we have an HAI”

Disinfectants are the first line of defence against pathogens wanting to wage war on your healthcare facility. But is your disinfectant really providing you with the protection your patients and staff deserve? Consider the evidence:

• Some disinfectants promise disinfection in two minutes but are unable to attain the requisite wet dwell time to achieve compliance. If they dry too quickly, they’re simply not doing the job.

• Some disinfectants play the numbers game by including a long list of bactericidal and virucidal kill claims but often do not include important ones like Norovirus. If the claims are not relevant, you may not be killing what you need to.

• Some disinfectants claim to feel better or have pleasant scents but still require personal protective equipment. How effective are your disinfection outcomes if your staff are concerned about their safety?

Reduce your exposure to HAIs, visit www.omgwehaveanhai.com to learn more.

www.virox.com
The truth is, C. difficile, MRSA and VRE may have been admitted to all these rooms.

- 33% of non-CDI rooms have tested positive for C. difficile.¹
- 55% of high-touch areas in patient rooms have tested positive for C. difficile.¹
- Admitting a new patient to a room previously occupied by a MRSA or VRE-positive patient, significantly increases the odds of acquiring MRSA or VRE.²

When the problems are facility-wide, the solutions have to be.

Clorox Healthcare™ Professional Disinfecting Bleach Products kill C. difficile spores quickly: wipes 3 minutes, liquids 5 minutes, and 46 other pathogens like MRSA & VRE in 1 minute*

Automated needle retraction prevents exposure to the contaminated sharp.

Activated VanishPoint syringes require less disposal space than other safety syringes & prevent disposal-related injuries.

Other available safety products:

- VanishPoint® Blood Collection Set
- VanishPoint® Blood Collection Tube Holder
- VanishPoint® IV Catheter
- Patient Safe® Syringe

VanishPoint

Needlestick prevention that meets your needs.

VanishPoint® Blood Collection Set
VanishPoint® Blood Collection Tube Holder
VanishPoint® IV Catheter
Patient Safe® Syringe

P: 972.294.1770 • F: 972.294.4400
Toll Free: 1.888.703.1010
rtiservice@vanishpoint.com
511 Lobo Lane • Little Elm, Texas 75068-0009 • USA

www.vanishpoint.com
Features

Barriers and bridges to infection prevention and control on a surgical unit at a Netherlands hospital and a Canadian hospital: A comparative case study analysis 145

Why low pH does not necessarily mean skin irritancy 161

Departments

Editorial ................................................................. 143

IPAC Canada News

President’s Message .................................................. 169
Message de le président ............................................. 171
From the Executive Desk ........................................... 173
Moira Walker Memorial Award for International Service 175
NICW media release ................................................. 177
Champions of infection prevention and control ............... 179
Diversey bursary ..................................................... 182
Virox scholarship .................................................... 183
Distance education graduates ..................................... 185

The Canadian Journal of Infection Control is the official publication of Infection Prevention and Control Canada (IPAC Canada). The Journal is published four times a year by Craig Kelman & Associates, Ltd. and is printed in Canada on recycled paper. Circulation 3000.

©2014 Craig Kelman & Associates Ltd. All rights reserved. The contents of this publication, which does not necessarily reflect the opinion of the publisher or the association, may not be reproduced by any means, in whole or in part, without the written consent of the publisher.

ISSN - 1183 - 5702

Indexed/abstracted by the Cumulative Index to Nursing and Allied Health Literature, SilverPlatter Information Inc. and EBSCO.

The Canadian Journal of Infection Control is a ‘Canadian periodical’ as defined by section 19 of the Canadian Income Tax Act. The deduction of advertising costs for advertising in this periodical is therefore not restricted.

www.ipac-canada.org
3 in 4 People are DISGUSTED by urine stains and odours.

Cleaning professionals report that removing urine odours is their No. 1 CLEANING PRIORITY.¹

Eliminate urine stains and odour with new Clorox® Urine Remover.

Urine Trouble?

Tough jobs demand smart solutions.

Urine is one of the toughest stains to clean and odours to remove. New Clorox® Urine Remover breaks down urine to quickly eliminate odours and remove stains.
Executive Officers

President
Bruce Gamage, RN, BScN, CIC
Network Manager
BC Provincal Infection Control Network
Suite 504, 1001 W. Broadway, RM 514
Vancouver, BC V6H 4B1
Tel: 604-875-4844 ext. 22981
 Fax: 604-875-4373
bgamage@phsa.ca

President-elect
Suzanne Rhodezien Rose, RN, BScN, CIC
Director Healthcare Quality and Patient Safety
Infection Prevention and Control Nova Scotia
1894 Barrington Street, Box 488
Halifax NS B3J 2A8
Tel: 902-722-1244 Fax: 902-428-2449
Suzanne.rhodezien-rose@gov.ns.ca

Direc тор
Mandy Deeyes, BScn, RN, CIC
Network Coordinator
Public Health Ontario — Simcoe Muskoka Infection Control Network
80 Victoria Street, Suite 7, Orillia ON L3V 7E4
Tel: 705-418-0253 Fax: 705-326-5434
Mandy.deeyes@oahpp.ca

Director
Victor Leung, MD, FRCPc
Infection Prevention and Control Physician
Providence Health Care
1190 Homby Street, 4th Floor, Vancouver BC V6Z 2K5
Tel: 604-806-0357 Fax: 604-806-8165
vleung@providencehealth.bc.ca

Director
Ramona Rodrigues, RN BSc MSc(A) CIC CNS
McGill University Health Centre, Montréal General Hospital
3650 Cedar ave.
Montréal QC H3G 1A4
Phone: (514) 934-1934 Ext: 42047
 Fax: 514-934-8427
ramona.rodrigues@muhc.mcgill.ca

Directo r
Michael Gardam, MSc, MD, CM, FRCPc
Medical Director, Infection Prevention and Control and Tuberculosis Clinic
University Health Network
200 Elizabeth Street, Toronto, ON M5G 2C4
Tel: 416-340-3758 Fax: 416-340-5047
michael.gardam@uhn.on.ca

Other Positions

Editor-in-Chief –
Canadian Journal of Infection Control
Chingiz Amirov, MPH, MSc QIPS, CIC
Director, Infection Prevention and Control
Baycrest Health Sciences
3650 Bathurst Street
Toronto, Ontario M6A 2E1
camrov@baycrest.org

Web Master
Shirley McDonald, ART, CIC
RR 1, 4759 taylor-Kidd Blvd
Bath, ON K1H 1G0
Tel: 613-389-9810 Fax: 613-389-8468
webmaster@ipac-canada.org

Online Novice IP&C Course
Coordinator
Heather Candom, BSc, MSc, CIC
Jane Van Toen, MALT, BSc, CIC
baxide@ipac-canada.org

Membership Services Office

Executive Director
Gerry Hansen, BA
PO Box 46125 RPO Westdale,
Winnipeg MB R3J 3S3
Tel: 204-897-9991 Fax: 204-897-9991
Gerry.hansen@ipac-canada.org

Administrative Assistant
Kelli Wagner
Tel: 204-488-5027 Fax: 204-488-5028
Toll-Free: 1-855-488-5027
admin@ipac-canada.org

Deliveries only:
67 Bergman Crescent, Winnipeg MB R3R 1Y9

Conference Coordinator
Pat Rodenburg
Tel: 780-436-0983, ext. 234
Fax: 780-437-5984
pat@buksa.com

Professional Agents

Legal Counsel
Susan Dawes, BA, MA, LLB
Myers Weinberg LLP
724-240 Graham Avenue
Winnipeg MB R3C 0J7
Tel: 204-926-1501
Fax: 204-956-8023
sdawes@myersfirm.com

Auditor
Philip Romanik, CA
Stefanson Lee Romanik
1151 Portage Avenue
Winnipeg MB R3G 0S9
Tel: 204-775-8975
promaniuk@olca.ca

Return to TABLE OF CONTENTS
STEVENS
“Where service is a commitment” | “Où le service est un engagement”

BRAND PRODUCTS
Exam Gloves

STYLES AVAILABLE:
• Nitrile
• Accelerator-Free Nitrile
• 12” Nitrile
• Synthetic Vinyl (PF)
• Stretch Synthetic Vinyl (PF)

Proud Partners Of

www.stevens.ca

Dear Colleagues,

This is going to be my last Editor-in-Chief message published in the journal. Effective next issue, this section of the CJIC will be retired, as peer-reviewed periodicals traditionally do not carry such editorials. However, I’d like to use this last editorial to broadly outline my vision of a roadmap for the CJIC development.

As a scientific periodical, we are in the business of knowledge transfer. To effectively meet this mandate, publishing articles is not enough. These articles need to be found, read and cited by other peers. This can be best achieved by getting indexed in a bibliographic citation database. For a biomedical journal like CJIC, the target database is PubMed/MEDLINE supported by the U.S. National Library of Medicine (NLM).

Getting CJIC indexed in PubMed/MEDLINE will be our critical objective for the next few years. Competition for getting indexed in this leading database is stiff. According to NLM, rejection rate currently stands at around 80%. Although there is no exact recipe for getting indexed, we have a good idea of what needs to be done. Our earliest chance of re-applying for a review will be in the spring of 2016. Additional time may be taken to increase our chances of success. Certain critical elements will need to be in place prior to re-application. They can be summarized as increased quality and quantity of content, and improved quality of editorial work. Scientific merit of CJIC’s content will be the primary consideration during the review.

Significant progress with these critical elements has been done by my predecessor, Pat Piaskowski, and the Editorial Board. Each of these elements will be fleshed out in greater detail to inform a comprehensive roadmap for CJIC development that I am working on now. Ultimately, the roadmap will need support of the IPAC Canada’s Board of Directors and the journal’s Editorial Board.

Importantly, transition to a new iteration of CJIC is going to be a delicate balancing act. While making progress towards the above critical elements, it will be equally important to keep the journal cost-effective through our continued work with the publisher and industry partners.

Remember that you, as a member of IPAC Canada, have an important role to play in this process. Ultimately, it is your high-quality manuscripts that will help us get indexed. I strongly encourage all of you to consider submitting your articles to CJIC and I am truly excited about possibility of developing CJIC into a robust scientific periodical that we all can be proud about.
**Fast + Effective**

**A Fast and Effective Equipment Washer...**

*Medco Equipment, Inc.*'s multipurpose portable equipment washer provides dramatic bacteria reduction. Independent lab tests have documented an impressive 99.9% reduction in bacteria **after one wash**! This machine washes and sanitizes two wheelchairs in five minutes. It also cleans commode chairs, shower chairs, walkers, carts, window screens etc. **2,000 customers worldwide are now sanitizing more than 3.4 million wheelchairs yearly!**

Free 30 day trial and delivery. Rent, lease-purchase or purchase. It's a portable dishwasher for wheelchairs and equipment! All stainless steel. CE.UL and CUL listed, 5 year wall to wall warranty. Seven day delivery.

For more information call (800) 717-3626 or visit [www.medcoequipment.com](http://www.medcoequipment.com)
ABSTRACT

Background
The overall aim of this research was to explore why some hospitals are more successful than others at reducing the acquisition rates of multidrug-resistant organisms (MDRO).

Method
Using a socio-ecological perspective on health systems adapted from works in ecological restoration, ecosystems management, and healthcare, a participatory comparative case study design was employed. The study was conducted on a surgical unit at a Netherlands hospital with very low rates of MDRO and a surgical unit in a Canadian hospital with higher rates of these pathogens. Research methods included a total of six unit observations, nine practitioner-led photo walkabouts of the units (n=13), six focus groups (n=26), and the review of relevant policies and procedures.

Results
When looking at the whole system for infection prevention and control in the context of particular environmental design constraints, and where hospital staff have reinforced norms of vigilance to prevent cross contamination, there were multiple conditions or activities at the Netherlands hospital that differed from the Canadian hospital which may have had an impact on the lower MDRO prevalence rates. These conditions or activities included differences in ratios of hospital beds per capita, bed occupancy rates, equipment cleaning processes in place, bed cleaning systems (centralized versus manual) and the presence of an active grassroots Hygiene in Practice group engaging practitioners in several ongoing activities to promote infection prevention and control.

Conclusion
Given these clear differences between the two study sites, it is important to try to generate further evidence-informed rationale for these and other interventions in order to guide health system leaders who need to decide where to allocate finite resources.

INTRODUCTION

Many studies and guidelines have been published in the last 10 years that support the implementation of interventions to prevent and control methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE) and other multidrug-resistant organisms (MDRO). Although published studies have shown successful reductions or elimination of MDRO, several factors limited the ability to draw general conclusions from these results, including differences in definitions of MDRO, study design, outcomes, confounding variables, and periods of follow-up (1). Additionally, the studies in questions were largely descriptive or quasi-experimental in nature (2) and had no explicit theory articulated about infection prevention and control (IP&C) as the basis for the research design.

The use of theory-driven research, which is largely lacking in the patient safety (3-5) and infection control literature (6,7) is beneficial to build theory which more accurately reflects the real world and can possibly, at some point, assist in predicting how intervening in one specific way will affect outcomes. Given the lack of
theoretically driven studies to date in the field, it has not been possible to determine which interventions or specific combinations of interventions are most effective in reducing the incidence of MDRO. In pursuit of contributing to the work of building theory about IP&C in complex health systems, a socio-ecological approach on health systems which draws on several fields (8-10) was used to inform this research design. A participatory research approach was employed to generate and share scientific and local knowledge about the places we inhabit within the larger context of understanding socio-ecological systems as a whole (10-13).

The core elements of the socio-ecological framework that guided this study, adapted from Stokols (14), Waldvogel (15), Struelens (16) and Marck et al. (17) are those of citizen science, place ethic, engaged practice, and adaptive learning and growth. The first element, citizen science, refers to the collaborative approach between researchers and participants to conduct and translate the research into policy and practice (10,12).

The second element, place ethic, refers to the need to understand and respect the history, culture, knowledge and rituals of communities (9,18), including what they see as key in providing the care for their patients and their environment. The third element, engaged practice, refers to the ongoing use of self monitoring and feedback to develop and incorporate evidence-informed IP&C practices (9,10) into the way that individuals, teams, and healthcare communities work. Finally, the fourth element, the notion of adaptive learning and growth, refers to the creation and use of strategies to share experiences and learnings with others in order to ensure sustainability (8-10,19,20).

The purpose of this research was to conduct a comparative case study analysis of two hospital units. The two case studies were conducted in order to develop a better understanding of what may be shaping the apparent differences in the prevention of MDRO between a hospital in the Netherlands and a Canadian hospital. The first case study was conducted on a surgical unit in an acute care hospital in the Netherlands, which reported rates of MDRO below 1% (21). The second case study was conducted on a surgical unit at a Canadian hospital, which reported higher rates of these pathogens (22).

**METHODS**

**Case Selection**

In order to better understand the nature of IP&C practices in two different countries, two hospitals were selected on the basis that they differed in their rates of MDRO infections, where in the Netherlands, the methicillin-resistant Staphylococcus aureus (MRSA) prevalence rate was reported as being less than 1% (23) whereas the overall incidence of MRSA in Canadian hospitals from 1995 to 2007, increased from 0.65 to 11.04 cases per 10,000 patient-days (24). Both these hospitals were also academic health sciences centres of similar size in publicly funded systems. These observations suggested that exploring hospital practices on these units in these two countries might reveal critical differences that might shed light on their different acquisition rates.

**TABLE 1: Summary of Statistical Information**

<table>
<thead>
<tr>
<th>Elements</th>
<th>The Netherlands Hospital</th>
<th>Canadian Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization for Economic Co-operation and Development (OECD)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total national health expenditure</td>
<td>9.8% Gross Domestic Product (GDP)</td>
<td>10.1% Gross Domestic Product (GDP)</td>
</tr>
<tr>
<td>Practicing physicians</td>
<td>3.93 per 1,000 population</td>
<td>2.18 per 1,000 population</td>
</tr>
<tr>
<td>Nurses</td>
<td>8.69 per 1,000 population</td>
<td>9.02 per 1,000 population</td>
</tr>
<tr>
<td><strong>City Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population</td>
<td>294,742</td>
<td>898,150</td>
</tr>
<tr>
<td>Total acute care beds (adult)</td>
<td>2,400</td>
<td>1,598</td>
</tr>
<tr>
<td><strong>Hospital Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating budget</td>
<td>884 million euro = 1.23 billion Can$</td>
<td>$1.08 billion Can$</td>
</tr>
<tr>
<td>Number of beds</td>
<td>1,042</td>
<td>1,174</td>
</tr>
<tr>
<td>144 patient rooms with single beds (14%)</td>
<td>100 patient rooms with single beds (8.5%)</td>
<td></td>
</tr>
<tr>
<td>Admissions</td>
<td>31,420</td>
<td>46,426</td>
</tr>
<tr>
<td>Emergency Department visits</td>
<td>22,564</td>
<td>126,850</td>
</tr>
<tr>
<td>Outpatient visits</td>
<td>336,000</td>
<td>938,209</td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td>7.7 days</td>
<td>7.9 days</td>
</tr>
<tr>
<td>Employees</td>
<td>10,668 staff</td>
<td>12,029 staff</td>
</tr>
<tr>
<td>2,560 Registered Nurses</td>
<td>3,489 Registered Nurses (RN)</td>
<td>314 Registered Practical Nurses (RPN)</td>
</tr>
<tr>
<td>Infection control program staffing</td>
<td>1.32 FTEs per 250 beds</td>
<td>2.72 FTEs per 250 beds</td>
</tr>
<tr>
<td><strong>Unit Level</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of beds</td>
<td>34</td>
<td>40</td>
</tr>
<tr>
<td>6 rooms with single beds (18%)</td>
<td></td>
<td>4 rooms with single beds (10%)</td>
</tr>
</tbody>
</table>
Although these two hospitals were similar in size, with comparable average length of stays, the number of patient rooms with single beds and the total number of acute care beds available per capita were much greater in the Netherlands. Furthermore, the city in the Netherlands was much closer to agricultural production, while the Canadian city was very urban. In addition, the volume of admissions, emergency department visits, and outpatient visits differed greatly. There were also differences in the composition of the healthcare workforce, with almost twice the proportion of practicing physicians per 1,000 population in the Netherlands as in Canada, but only half the proportion of designated infection control professionals in the Netherlands hospital as in the Canadian hospital. A summary of statistical information on the two case study contexts is available in Table 1.

The first case study was conducted on a 34-bed surgical unit at a Netherlands hospital consisting of orthopedic, cosmetic, urology, general surgery and no off-service patients. The second case study was conducted on a 40-bed unit at a Canadian hospital with a general surgery, otolaryngology and ophthalmology population as well as off-service patients due to overcapacity. These two units were selected for their similar patient populations.

Data Collection
This study involved two comparative case studies. Ethical approval was obtained by each hospital’s Research Ethics Board. The data collection methods conducted by the lead author (CB) included six field observations of the clinical units, the collection of IP&C policies and procedures, nine practitioner-led photo walkabouts (n=13), six focus groups (n=26) to review and obtain further discussion about the narratives and photographs collected during the walkabouts, and the collection of MDRO rates.

Data Analysis
Following successive iterative analyses of the individual case studies, a cross-case synthesis technique [25,26] was used to compare and contrast perspectives and analyze themes found in the two case studies.

Results
The two case studies had the following similar themes:
1. Considerable IP&C challenges were inherent to the design of the clinical unit.
2. Nurses and other staff employed a wide variety of workarounds to try to adapt to the design of their care environment.
3. Participants viewed organizational and team cultures as integral to the way they enact IP&C practices in their workplaces.
4. In the face of numerous system constraints, participants viewed engaged leadership as important for IP&C.

Some key findings for each of these themes are compared below.
tals had four-bed patient rooms. In the Netherlands, the four-bed rooms were located in the corners of the unit, with the beds forming a L shape; in Canada, the four beds were facing each other with two bays on each wall. Nonetheless, shared bedrooms and bathrooms are a common IP&C problem in most hospitals across the globe (27,28).

Lack of storage space on the units was another environmental challenge for both case study sites. Both hospitals stored equipment in the hallway. At the Netherlands hospital, for example, the photograph in Figure 2 (a) shows the storage of a housekeeping cart, a wound dressing cart, a blood pressure machine, and a dirty linen cart in the hallway. Despite the presence of equipment in the hallway, though, the Netherlands hospital has many storage areas on the unit. For example, Figure 2 (b) displays a photograph of the linen closet. This storage limits the number of individuals who access the linens and thus reduces the chances of cross-contamination.

In the hallway of the Canadian hospital, Figure 3 (a) illustrates that there were several carts (e.g., isolation, linen) and blood pressure machine visible. Contrary to the Netherlands hospital, there were no storage area for linen supplies, and thus the cart is kept in the hallway where it is accessible to all the staff, patients, and visitors (Figure 3 (b)).

At the Netherlands hospital, there was one dirty utility room on the unit (Figure 4 (a)). By contrast, at the Canadian hospital, there were no dirty utility rooms on the unit. There was only a very small dirty hold outside of the patient rooms (Figure 4 (b)). During the focus group with the support staff, a participant explained that: “the dirty hold, at least that’s accessible for [when] you have something dirty… And it is labelled. Yeah, it’s labelled, it’s clear. So even visitors, if they’re looking around for something they know that it’s a dirty area” (FG support staff, P8, 664).

At the Canadian hospital, the dirty utility room is located off the unit near the elevators. The housekeeping manager explained: “You have to leave the unit to go to the soiled utility room and I would like for your analysis to remark the distance that a worker has to travel no matter who it is, to bring something soiled and so that begs the question because it’s not easy access, are people just dumping soiled equipment in the hallway” (PW housekeeping manager, P5, 1094).

In addition, in both hospitals, there was often very little space for nurses to set up their necessary supplies in order to provide care for the patient. For example, at the Netherlands hospital, the patient’s bedside table contained stored equipment in the hallway. At the Netherlands hospital, for example, the photograph in Figure 2 (a) shows the storage of a housekeeping cart, a wound dressing cart, a blood pressure machine, and a dirty linen cart in the hallway. Despite the presence of equipment in the hallway, though, the Netherlands hospital has many storage areas on the unit. For example, Figure 2 (b) displays a photograph of the linen closet. This storage limits the number of individuals who

“It is evident by these photographs that nurses need more space to work as well as adequate, easily cleaned surfaces on which to place patient care equipment.”

FIGURE 2A: The Netherlands hospital - Equipment in hallway (MGMT-37)

FIGURE 2B: The Netherlands hospital - Linen storage closet (IC-66)

FIGURE 3A: Canadian hospital - Equipment in hallway (C-HK-01)

FIGURE 3B: Canadian hospital - Linen cart in hallway (C-NS-16)

FIGURE 4A: The Netherlands hospital - Dirty utility room (IC-43)

FIGURE 4B: Canadian hospital - Dirty hold (C-NS-08)
Nurses and other staff employed a wide variety of workarounds to try to adapt to the design of their care environment.

The environmental design of both hospitals creates many challenges to IP&C practices and lead staff to develop and adopt a variety of workarounds. An example was the equipment cleaning process at both hospitals. At the Netherlands hospital, the unit developed a process whereby they stored clean equipment in one hallway (Figure 6 (a)) and dirty equipment in another hallway to minimize the chances of someone taking dirty equipment for use with another patient. Furthermore, a checklist was developed at the Netherlands hospital to clearly identify who, when, and how each piece of equipment should be cleaned (Figure 6 (b)). This checklist was posted in the dirty utility room of the unit.

During the photo walkabout with a Netherlands nurse, she explained that the equipment in this hallway is clean and the equipment in the other hallway is dirty. The staff are aware of this process and when they need a patient table, for example, they know which side of the hallway to obtain a clean table (PW nurse, P9, 201).

At the Canadian hospital, some nurses held that the cleaning of equipment is the responsibility of the housekeeping staff. The nursing staff did not seem to be aware of any guidelines indicating who was responsible for cleaning equipment. However, the patient lift below had a sign indicating that housekeeping had cleaned it (Figure 7). Although the labeling is a clear mechanism for accountability at the Canadian case study site, a related critical step seems to be in doubt, which is that staff need to consistently remove the sign once they have used the equipment to ensure that it is not re-used on another patient until it is re-cleaned again. As a participant explained: “It’s excellent; the only thing is that it’s only as good as, as long as the nurse takes off the sign once it’s been used, right. Because housekeeping’s not going to go re-clean that until that sign’s off. But someone has to, there’s a human element; someone has to actually remove the sign to say I’ve used it. Ideally this should be stored.
in a clean hold somewhere, because obviously anyone coming by can touch it with soiled hands so that’s the only thing” (FG management, P9, 495).

Furthermore, another Canadian participant explained that there is often: “no label to say whether [the equipment is] clean or dirty. And usually you get a bad surprise when you pull up the seat and you see, I guess [this commode] has not been cleaned. It’s just the general principles of the clean should be put away somewhere as opposed to just out there [in the hallway]” (FG management, P9, 443).

According to a key informant, housekeeping is expected to put a “clean” label on the equipment and nursing is then supposed to remove it upon use. However, this process has not been audited to see how well this is being followed.

Participants viewed organizational and team cultures as integral to the way they enact IP&C practices in their workplaces. Culture is reflected by the kinds of communication that occur within a team; effective communication is important in order to obtain optimal patient outcomes (29). At the Netherlands hospital, a clear communication strategy was the isolation card found posted underneath the room number. The card read “barrière-box” isolation with gloves and gowns symbols (Observations, P1, 19). A participant said that: “with the isolation room you have this card so everybody who enters the room knows that this is happening and what you have to wear” (PW housekeeping staff, P5, 95).

An example of effective communication at the Canadian hospital that promotes a culture of safety was demonstrated on the unit. When a patient is discharged, the isolation sign is left up until the housekeeper has cleaned the room. The housekeeping manager explained that: “On the bottom of each sign, it says ‘only housekeeping staff can remove the sign…and then when the housekeeper removes it and he does all his checklists, he hands this in as proof that it was done using the proper techniques” (PW housekeeping P5, 638).

However, examples of ineffective communication regarding IP&C were also discussed at both study sites. For instance, at the Netherlands hospital, a participant stated: “There’s not enough information to the staff about infection control measures during a [patient] transport. They wear gowns and gloves when they’re in the room but they don’t tell the staff what to do during transport, so they’re not informed” (FG Management, P12, 121).

Similarly problematic communication was presented at the Canadian hospital by a participant who explained: “There’s a specific code for an isolation patient in the patient tracking system that rarely gets used. I mean if it is used, when the porter picks up the call it says, patient on isolation so he knows right away that he needs to get his [personal protective equipment]. But I mean it’s so very rarely used, the [porter] gets to the room and says: I didn’t know, nobody told me...the patient wasn’t [coded] in the system as an isolation patient” (FG support staff, P8, 947).

These examples indicate that sufficiently clear mechanisms to promote effective communication amongst staff are not always in place, a factor that can contribute to the occurrence of preventable adverse events (29).

In the face of numerous system constraints, participants viewed engaged leadership as important for IP&C. As a critical component of organizational
governance, engaged leadership was identified in both study sites as important for supporting consistent IP&C practices within an organization. An example which requires engaged leadership and governance both within and external to individual healthcare organizations, was the management of the bed occupancy issues. Overcapacity can be a significant barrier to IP&C in hospitals. The city in the Netherlands had 8.0 acute care beds per 1,000 population; whereas the number of acute care beds was much lower (1.77 beds per 1,000 population) in the Canadian city.

The average bed occupancy rate reported, at the Netherlands hospital, was estimated at approximately 80% whereas at the Canadian hospital, the average rate was 98.5%. Although, these rates differed slightly in their calculations (e.g., the Netherlands hospital did not factor in bed closures); nonetheless, the Netherlands hospital did not appear to have the overcapacity issues that were present in the Canadian hospital during the study period. In order to minimize the impact of high bed occupancies, management had developed policies and procedures at the Canadian hospital. For example, bed management meetings were held daily. In attendance were the patient flow managers and the clinical managers. A clear policy and procedure was developed to ensure communication and a consistent approach to the issues.

Another activity that requires management support was antibiotic prescribing policies. Antimicrobial stewardship is a key process in the prevention and spread of MDRO. At the Netherlands hospital, a yearly antibiotic usage report was published and shared with the department heads. The antimicrobial Defined Daily Dose (DDD) was 62.2 per 100 patient-days. Comprehensive antimicrobial data was collected including the defined daily dose (DDD) but antimicrobial was not prospectively controlled. The Canadian hospital, on the other hand, did not collect DDD data but carried out retrospective reviews of appropriate use of selected drugs (e.g., vancomycin, meropenem, fluconazole). The designated antimicrobial pharmacy specialist reviewed these target antibiotics on a periodic basis and made a determination about the appropriateness of use. The information was presented to the Antimicrobial Subcommittee of the hospital and antibiotic house staff education sessions were provided as needed.

It is also evident that management in both study sites supported a variety of environmental cleaning processes, but with some possibly important differences. At the Netherlands hospital, a centralized hospital-wide bed cleaning system was in place. A physician participant pointed out: “a bed that’s going off the unit to be cleaned... It’s going to be washed... in this building; it’s like a car wash” (PW physician, P8, 272).

As another Netherlands participant noted: “What a good system...beds are cleaned well at the central bed cleaning department” (FG health professionals, written comments, P26, 08).

This preferred method to manual cleaning provided consistent cleaning procedure with high temperatures (Dutch Working Party on Infection Prevention, 2007). However, at the Canadian hospital, beds were manually cleaned on the unit by the housekeeping staff when a patient was discharged.

Over 10 years ago, the search-and-destroy strategy for MRSA was implemented at the Netherlands hospital. The strategy consisted of the screening of high-risk patients which included mainly patients admitted from foreign hospitals and individuals who had come into close contact...
with live pigs or calves. Screening cultures were taken when MRSA was suspected or to rule out MRSA contamination. The Canadian hospital implemented a universal MRSA screening strategy where all patients were swabbed for MRSA and VRE on admission. The number of admitted patients screened for MRSA and VRE is presented in Figure 8 and Figure 9.

The prevalence rates for MRSA, VRE, CDI and extended spectrum beta-lactamasases (ESBL) were compared in Figures 10 to 13. During the study, only high-risk patients at the Netherlands hospital were screened whereas at the Canadian hospital, all patients were screened on admission.

Furthermore, despite the overall common themes between the two individual case studies presented above, the following themes differed between the two cases:

1. Participants who engaged in communal practice activities tended to monitor and support the use of recommended IP&C practices. Findings for this theme were only evident in the Netherlands hospital case study. For example, there was presence of a group called Hygiene in Practice (HIP), consisting of clinical staff, to develop and implement sound IP&C practices on the clinical units across the hospital. This concept of a community of practice provided a forum for engaged practice where groups of professionals worked on initiatives to create, implement and evaluate evidence-informed care improvements. This type of community of practice, or any similar forms of communal IP&C practice groups, was not identified in the Canadian hospital.

2. The use of knowledge about IP&C supported adaptive learning and growth. At the Netherlands hospital, the evidence-informed IP&C education provided by the grassroots HIP group built on the current staff knowledge and experience and was geared to address gaps in practice. This kind of coordinated educational initiative provided a strong example of adaptive learning and growth. At the Canadian hospital, there was not a consistent or standardized approach to IP&C education across the organization. IP&C education was provided at a program level to staff by their respective clinical educators. While there was no question that useful learning may be occurring with these non-standardized approaches, it was not possible to accurately assess what standardized learning was actually taking place.

3. Common practices posed barriers to sound IP&C. At the Canadian hospital, participants were concerned with some common practices that did not support recommended infection control practices on the unit. For example, some participants were concerned that the patient equipment was not cleaned consistently before and after patient use. At the Netherlands hospital, mechanisms were put in place to ensure that all staff were aware of their responsibilities related to equipment cleaning.

Overall, it was difficult to confidently speculate why the themes discussed above were only present in one case study and not the other. Potential
explanations may include the differences between the two sites in grassroots involvement in IP&C, in approaches to IP&C education, and in the methods in place to ensure sound IP&C practices.

Discussion
The key findings provided a starting point to better understanding the system for IP&C through the practitioners’ experiences in these two organizations and demonstrated that there were several similar and different practices in place for IP&C in both hospitals, as well as a lack of comparable data between the two cases.

Common findings across both cases included the perceived importance of engaged leadership, a lack of antibiotic prescribing restrictions, the presence of environmental design issues and the frequent use of workarounds that may be problematic for IP&C. Emerging research suggests that engaged leadership and board involvement is associated with improved patient outcomes (30-32). This engagement includes working with practitioners and other stakeholders to help develop more effective means of monitoring and addressing the “ability to deliver safe, effective, high quality care within organizations with the right cultures, the best systems and the most highly skilled and motivated workforces” (36) (p. 8). Both hospitals had reporting structures that provide IP&C related information to the Board of Directors. What is less clear and warrants further study in future work is, as Ramsay et al. (32) suggest, the precise nature of the inter-relationships between internal governance, external governance, and incidence of HAI.

Furthermore, the appropriate use of antimicrobial agents (antimicrobial stewardship) was critical in reducing the emergence of antimicrobial-resistant organisms. Although the Netherlands hospital produced an antibiotic usage report on a yearly basis, and the Canadian hospital carried out retrospective reviews of the appropriate use of selected antibiotics, neither hospital had any mechanisms in place to restrict antibiotic use. As hospital pathogens become more resistant, stringent guidelines need to be implemented to support the judicial use of antibiotics (38).

Another common finding across both cases was the environmental design issues which often lead healthcare providers to use workarounds. According to Amalberti and colleagues (39), workarounds in complex healthcare systems may be conceptualized as the “adaptation of procedures by workers to deal with the demands of the work” (p. i67). Overall, the design of the unit can also have a strong influence on the risk of MDRO contamination. Joseph (27) and Ulrich (28) recommended single patient-bed rooms each with private washrooms as well as appropriate storage on the unit for all new construction. In addition, adequate access to ABHR or soap and water at point of care is necessary in order to reduce cross contamination in multiple patient rooms. According to the World Health Organization (40), the ABHR dispensers should be located at point of care. In addition, Creedon (41), Suresh et al. (42) and Harbarth et al.(43) supported the notion that ABHR

![FIGURE 11: Cross-Case Comparison of VRE Prevalence Rates](image-url)
dispensers should be located in many convenient locations around the unit.

When looking at the whole system for IP&C in the context of particular environmental design constraints, and where hospital staff have reinforced norms of vigilance to prevent cross contamination, there were multiple conditions or activities at the Netherlands hospital that differed from the Canadian hospital which may have had an impact on the lower MDRO prevalence rates. These conditions or activities included differences in ratios of hospital beds per capita, bed occupancy rates, equipment cleaning processes in place, bed cleaning systems (centralized versus manual) and the presence of an active grassroots Hygiene in Practice group engaging practitioners in several ongoing activities to promote IP&C. Given these clear differences between the two study sites, it is important to try to generate further evidence-informed rationale for these and other interventions in order to guide health system leaders who need to decide where to allocate finite resources.

Research has shown that bed occupancy rates can have a significant impact on the rate of MDRO infections (44-47). Studies have shown that occupancy rates higher than 90% have higher MRSA infection rates than those with rates below 85% [48,49]. The bed occupancy rate was approximately 80% in the Netherlands hospital and 98.5% in the Canadian hospital. Occupancy rates were often near or above 100% at the Canadian hospital. Once bed capacity was reached, patients were admitted in the hallways or common areas and were at higher risk of infections due to “overworked staff who try to care for these patients in an environment that makes it difficult to follow best practices” (50) (p.20). This supports the idea that bed occupancy rates may provide a useful indicator of a hospital’s ability to control or eradicate MDRO infections. At the health system level, one of the possible causes of overcapacity at the Canadian hospital study site may be the unusually low number of acute care beds available for the population served. Other contributors may include inadequate access to timely public health, primary healthcare, and home care services and inadequate access to appropriate assisted living and long term care facilities.

The findings also suggested that we need a better understanding of which kinds of environmental cleaning are most important for IP&C and in what contexts. Current evidence indicates that equipment should be cleaned and disinfected between each patient to avoid cross-contamination (51). Enhanced environmental cleaning has shown to decrease environmental contamination of MDRO (52) and decrease the likelihood of patients acquiring HAI (53-56). However, the centralized bed cleaning system at the Netherlands hospital is a process not common in North America. Further research on the effectiveness of this method in limiting MDRO transmission is needed. The different approaches (centralized versus manual) to bed cleaning practices warrant further investigation in regards to the effectiveness of these techniques at reducing hospital infections.

Unique to the Netherlands hospital case study is the Hygiene in Practice (HIP) group, a grassroots community of practice that oversaw, implemented and promoted evidenced-informed IP&C practices in the hospital. Healthcare workers who take ownership of the infection control issues on their unit can significantly improve MDRO rates (Plexus Institute, unpublished report, 2009). While we are well aware of the benefits of the support from IP&C experts, it is worth exploring which kinds of

<table>
<thead>
<tr>
<th>FIGURE 12: Cross-Case Comparison of CDI Prevalence Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per 1,000 patient days</td>
</tr>
<tr>
<td>NETH Hospital</td>
</tr>
<tr>
<td>CAN Hospital</td>
</tr>
</tbody>
</table>
community of practice (e.g., unit-based practitioner-led or IP&C-led) have the most positive influence on IP&C practices in which contexts.

The research findings also revealed a lack of comparable findings between the two cases on the aspects of hand hygiene audit protocols (observations versus product measurement), surveillance and control strategies (high risk versus universal screening), reporting of acquisition rates (prevalence versus incidence rates), and the nature and extent of high risk populations for community-acquired methicillin-resistant Staphylococcus aureus (e.g., people in contact with pigs, veal calves or other livestock versus drug users, homeless people and prisoners) in the two hospitals’ catchment areas. Hand hygiene adherence rates between the two hospitals were not comparable. The method used to monitor adherence to hand hygiene practices at the Netherlands hospital was measuring the unit-based consumption of alcohol-based hand rub (ABHR). In contrast, the Canadian hospital used direct observations. According to the World Health Organization, direct observation is the recommended method to monitor hand hygiene compliance. Monitoring product consumption does not determine if proper hand hygiene was performed. Furthermore, the amount of product consumed may not be accurate, as it could also include the quantity of product used by visitors and patients (40).

Many IP&C guidelines recommend either universal (all patients) or targeted (high risk patients) MRSA and VRE screening on admission (21, 57, 58). The significant differences in screening strategies for MRSA and VRE between the Netherlands hospital, which conducted high risk screening only, and the Canadian hospital, which conducted universal screening of all patients on admission, can have an impact on the differences in reported rates. At the Canadian hospital, we would expect to detect more cases because all patients were screened (universal screening), whereas in the Netherlands only the high-risk population was screened.

Another challenge was the difference in reporting of MRSA, VRE, CDI and ESBL rates between the two hospitals. At the Netherlands hospital, only prevalence rates of MRSA, VRE, CDI and ESBL were reported, whereas at the Canadian hospital, incidence rates of these pathogens were reported. In order to allow for some comparison between the two hospitals, prevalence rates were obtained from the Canadian hospital. It is not possible, however, to distinguish between hospital-acquired and community-acquired MRSA cases. The high-risk groups for community-acquired MRSA differed between these two countries. In the Netherlands, the high risk group was people in contact with pigs, veal calves or other livestock (Dutch Working Party on Infection Prevention, 2007) whereas in Canada, the high risk group included: injection drug users, homeless people, the incarcerated, and native aboriginals (First Nations people) (24).

In the Netherlands case study, the monthly MRSA prevalence rate ranged from 0 and 0.67% which was consistent with the rate of less than 1% (23) published in the literature. In the Canadian case study, the monthly MRSA prevalence rate was greater, ranging from 3.87 and 7.11%. The monthly VRE prevalence rate in the Netherlands case study ranged from 0-0.5% compared to 0-1.1% in the Canadian case study. Also, the CDI prevalence rate was lower, ranging from 0 and 0.8% in the Netherlands case study compared to 2.03-4.64% in the Canadian case study. However, the monthly ESBL prevalence rate was higher, 0.98%-4.27%.

<table>
<thead>
<tr>
<th>NETH Hospital</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>9.76</td>
<td>16.9</td>
<td>18.2</td>
<td>21.2</td>
<td>16.6</td>
<td>22.6</td>
<td>32.9</td>
<td>23.4</td>
<td>42.7</td>
<td>28.4</td>
<td>33.3</td>
</tr>
<tr>
<td>CAN Hospital</td>
<td>1.82</td>
<td>3.54</td>
<td>8.14</td>
<td>5.44</td>
<td>6.45</td>
<td>3.6</td>
<td>4.74</td>
<td>4.9</td>
<td>7.24</td>
<td>5.35</td>
<td>3.46</td>
<td>1.85</td>
</tr>
</tbody>
</table>

**FIGURE 13: Cross-Case Comparison of ESBL Prevalence Rates**

The Canadian Journal of Infection Control  | Fall 2014
in the Netherlands case study compared to 0.18-0.81% in the Canadian case study. Although MRSA, VRE and CDI rates may be below 1% in the Netherlands case study, other pathogens such as ESBL did not appear to be as controlled. This increase was seen in all European countries, and it had been suggested that colonization of the food-producing animals (especially poultry), facilitated through antibiotic use, lead to the contamination of meat. It is unknown yet, if food contamination was the source of this high prevalence in European hospitals (59).

There were several limitations to the study. It was possible that staff on the study units may have altered their behavior during unit observations. The use of multiple methods of data collection was intended to minimize these potential sources of bias. It was difficult to compare some key empirical elements between the two cases because of the different IP&C data collection and reporting methods carried out by each hospital. As previously indicated, for instance, hand hygiene observations were performed in the Canadian study site and the consumption of the ABHR was calculated in the Netherlands site. Because the case study hospitals used different antibiotic resistant measures (total prevalence count of isolates for one case and nosocomial incidence rates for the other), all data were converted to prevalence rates to allow for comparison. This data collected by others, however, limited the possibility of determining the proportion of MDRO that were hospital-acquired versus imported or community-acquired. Organizations should aim at adopting standardized practices at the national and international level (i.e., World Health Organization, Organisation for Economic Co-operation and Development (OECD), etc.) in order to facilitate better comparison of data. Comparable data would provide better information to drive health policy changes. Furthermore, only one clinical unit at each hospital was studied in this research, which means that the findings, while qualitatively rich and analyzed with a whole systems perspective, need to be interpreted cautiously. It is possible that hospital-wide, regional, or even country-wide factors could account for some of the differences in rates.

CONCLUSION

There is ongoing urgency in the field of infection control to respond to outbreaks without strong levels of evidence. This clinical reality cannot be dismissed, but there are several common findings across both cases that merit further study in our ongoing efforts to develop and translate evidenced-informed IP&C programs into policy and practice. It is equally important in future research to further investigate the significance of health system and organizational practices where there were disparate findings between cases, such as the differences found between the Netherlands and Canadian study sites in ratios of hospital beds per capita, bed occupancy rates, staffing practices, equipment cleaning processes, and bed cleaning systems (centralized versus manual), as well as the presence or absence of unit-based IP&C communities of practice.

As future studies are designed, the findings and methodological challenges identified in this study suggest that case selection in future comparative IP&C case studies should be based on an expanded list of criteria. These criteria should include comparable audit, surveillance and reporting practices and comparable demographic and other relevant data, such as data on the agricultural practices within and demographic attributes of vulnerable populations within the hospital catchment areas.

ACKNOWLEDGEMENT

The authors would like to thank the staff of both hospitals for participating in the study as well as the performance measurement team for providing the MDRO prevalence rates. The project was funded in part by the Canadian Patient Safety Institute, the University of Alberta Mary Louise Imrie Graduate Award and the Registered Nurses’ Foundation of Ontario Award (Rolling Stones/CPI Award) for the Advancement of Professional Practice in Infection Control. There is no conflict of interest with this manuscript.

REFERENCES

34. Rose JS, Thomas CS, Tersigni A, Sexton JB, Pryor D. A leadership
Presenting a New Solution

The Cough Shield Solution

CoughShield is a soft flexible device which accepts the product from a sneeze or cough against an antimicrobial recessed filter which is effective against a variety of germs which cause Influenza, Common Colds, Tuberculosis, SARS, Legionnaires Disease, Strep Infections, Staph Infections (MRSA), and many other infections. Its impermeable outer shell protects against hand contamination and the airborne dispersal of germs.

Completely Antimicrobial

The CoughShield and its container may be worn clipped to a waistband or pocket for quick access, used from a desk or bedside table, and contain an antimicrobial agent provided by Agion. When the CoughShield is returned to its container, germs trapped inside the filter are enclosed within antimicrobial walls which discourage contamination of nearby surfaces.

Extended Use

The recessed disposable/reusable filter has a basis weight equivalent to 10 standard 2 ply tissues, and is positioned away from the hands, nose and mouth for comfortable use through many coughs or sneezes. All components are latex free and dishwasher safe or may be pasteurized or washed in hot water and detergent. The filters retain their antimicrobial effectiveness for the life of the fabric, even after repeated washings in boiling water and detergent. Ten filters are provided, with replacement filters sold separately.

CONTACT

1-844-799-2228
coughshield@bellaliant.com

Visit our website to obtain a free delivered sample.

www.CoughShield.com
Hand washing is easy.
Changing behaviour is complex.

If reducing the risk of HAIs is a quality improvement goal that needs a hand at your organization, our Expert Advisors can help. They’ll assess your processes and make recommendations that meet your IPC needs.

Request a free estimate at:
accreditation.ca/advisory

ACCRREDITATION CANADA
Driving Quality Health Services

1-800-814-7769 x258 | advisoryservices@accreditation.ca

Advisory Services—leading quality improvement through customized support for accreditation
Why low pH does not necessarily mean skin irritancy

ABSTRACT

It is a perception of most end-users of cosmetic and skin hygiene products that low or high pH, as opposed to “neutral,” is related to skin irritation or, even worse, of skin breakdown. The marketing claims, in favor of neutral pH, used for advertising cosmetic products have a lot to do with this situation. From a toxicological point of view, low or high pH cannot be considered as a single factor for predicting the innocuousness of a cosmetic formulation.

Most end-users of skincare products focus on the pH. To them, a “good pH” is a “neutral pH” which is perceived as neutral to the skin but not necessarily as being the middle value (1) of the pH scale established from 0 to 14. Without describing all possible other factors that may truly be responsible for dermatitis, this paper should assist prescribers, infection control professionals (ICPs), and purchasers of microbicidal products in particular to understand this long-held notion on pH through a scientific examination of the effects of pH of microbicidal and cosmetic formulations on skin.

Method

Three foaming disinfecting hand soaps, with or without hydrogen peroxide and with or without perfume, were tested for skin irritation using an in vivo 48-hour patch-test on then healthy subjects (Laboratory Idea, France). The purpose of this experiment was to demonstrate their high level of skin tolerance despite the fact that their pH was about 2.

Results

All tested formulations were found to be non-irritating to the skin with Medium Irritation Index lower than 0.20.

Conclusion

In the experimental conditions of this study, it was demonstrated that properly formulated microbicidal products may be perfectly well tolerated by the skin even if they are acidic. The paper also demonstrates theoretically why pH should not be considered as the only predictive criterion in selecting skincare products.

INTRODUCTION

Many cosmetic and hygiene products have an acidic pH (deodorants, and alpha-hydroxy-acid based creams for instance) or an alkaline pH (soaps for example). Is this enough to consider them as potentially irritant to the skin? Or, is there another pH-related factor which is really the one to explore to predict skin irritations?

The circumstances surrounding the development of dermatitis are complex but do not involve any immunological mechanism (2). The level of skin irritation is generally linked to numerous factors such as the molecular weight, the partition coefficient and the chemical structure of components (acids, alkali, oxidizers, reducers, solvents, chelating agents, surfactants, etc.), their concentration, the contact time, the age, the skin area, the integrity of the skin, the environmental conditions (temperature, hygrometry) and so forth. The typical symptomatology is represented by the appearance of a local inflammatory reaction (vasodilation of micro-blood vessels with redness, edema, pain and itching), which might evolve, in extreme cases, towards skin necrosis (2).

This study was conducted in order to demonstrate experimentally that surfactant-based disinfecting foaming hand

KEY WORDS: Skin irritation, pH, pKa, hydrogen peroxide, disinfecting hand soap
lots (with or without hydrogen peroxide and with or without perfume) with low pH (about 2) would not be irritating to the skin. This paper also demonstrates theoretically why an acidic or alkaline pH in itself does not necessarily mean that a given preparation will be irritating to the skin.

**IN VIVO SKIN IRRITATION STUDY**

**MATERIALS AND METHODS**

The pH of three foaming disinfecting hand lotions, with or without hydrogen peroxide, and with or without perfume, was adjusted to 2.05 +/- 0.05 using phosphoric acid (pK_a: 2.15; pK_a: 7.19; pK_a: 12.37). The purpose of testing the variants of the same initial formulation (formulation 1) was to check the influence of the addition of hydrogen peroxide at 1% and perfume at 0.20% on the final skin irritation scores.

The qualitative compositions of the test-formulations are described in table I. The epicutaneous tests (patch-test on volunteers) consisted of applying for 48 hours the test-product onto a defined skin area, situated on the internal face of the arm, using an occlusive patch “Finn Chamber Test”.

A dose of 0.02 ml of test-product, pre-diluted at 5% in distilled water, was applied on the skin of one arm and maintained in contact for 48 hours with a semi-occlusive plaster, in order to maximise the potential effects. Obtained diluted solutions of test-products had a pH of 2.00 +/- 0.05.

Ten healthy female and male subjects (with normal skin), aged 18 to 65, and not suffering from any dermatological disease, were involved. The qualitative compositions of the test-formulations are described in table I.

The clinical score measurement, 30 minutes after the plaster removal, took into account the redness, edema and blistering. Depending on the intensity of the skin reaction, the score ranges from 0 to 4. The sum of the scores, divided by the number of subjects, defines the Medium Irritation Index (M.I.I.) (3), which allows us to classify the test-products according to table II.

**RESULTS**

In the experimental conditions of the three in vivo studies, the test results (Table III) showed that all M.I.I. of the test-formulations were all inferior to 0.20, which classifies them as non-irritant. These results are consistent with a previous in vivo 48h single patch-test skin irritation study (4) which involved ten healthy subjects and five formulations of surfactant-based hand cleansing lotions whose pH had been adjusted to 3 or 10, using aqueous solutions of strong and weak acids (hydrochloric acid and lactic acid), as well as strong and weak bases (sodium hydroxide and sodium carbonate). All tested formulations herein at pH of 3 or 10 were found to be non-irritating.

The results of this study are also consistent with the theoretical toxicological approach below.

**TABLE 1: Test formulations**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Formulation 1</th>
<th>Formulation 2</th>
<th>Formulation 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deionised Water</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Amphoteric Surfactant</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Non Ionic Surfactant</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Butylene Glycol</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Skin Conditioner</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Parfum</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrogene Peroxide</td>
<td></td>
<td></td>
<td>0.20% w/w</td>
</tr>
<tr>
<td>Preservative</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Organic Acid (to make up to pH 2.00 – 2.10)</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Final pH as neat</td>
<td>2.05</td>
<td>2.01</td>
<td>2.03</td>
</tr>
</tbody>
</table>

**SKIN IRRITATION AND BREAKDOWN THEORY IN RELATION WITH LOW OR HIGH pH**

For the skin to be damaged, a contact between the toxic substance and the organism is required. During the chemical reaction, corrosives and irritants exchange electrons with the skin components (lipids, sugars, amino acids, enzymes). This concept is called “donor-acceptor electron exchange” where the chemical and the skin components can alternatively play the role of electron donor or acceptor. This exchange involves six types of aggressive chemical reactions: acidic, alkaline, oxidation, reduction, chelation, and solvation. Ions for acidic-alkaline reactions, electrons for oxidation-reduction reactions, or parts of molecules (addition-substitution) are exchanged between the aggressive chemical and the skin components (5).

Therefore, predicting the skin irritating potential of cosmetic ingredients must be mainly based on their chemical structure, their physical and chemical properties, their mode of action and their concentration. Most soaps and detergents are alkaline and induce an increase in cutaneous pH, which affects the physiological protective “acid mantle” of the skin by decreasing the fat content. For instance, sodium lauryl sulphate (SLS), an anionic surfactant, is a reference irritant used in many skin irritation studies.

“This paper also demonstrates theoretically why an acidic or alkaline pH in itself does not necessarily mean that a given preparation will be irritating to the skin.”
Area of reaction for the acidic or the alkaline chemicals

**TABLE 2: Medium Irritation Index classification**

<table>
<thead>
<tr>
<th>M.I.I.</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.20</td>
<td>Non irritant</td>
</tr>
<tr>
<td>0.20 ≤ M.I.I. ≤ 0.50</td>
<td>Slightly irritant</td>
</tr>
<tr>
<td>0.50 ≤ M.I.I. ≤ 2.00</td>
<td>Moderately irritant</td>
</tr>
<tr>
<td>2.00 &lt; M.I.I. ≤ 3.00</td>
<td>Very irritant</td>
</tr>
<tr>
<td>M.I.I. &gt; 3.00</td>
<td>Extremely irritant</td>
</tr>
</tbody>
</table>

**TABLE 3: Summary of obtained irritation test results**

<table>
<thead>
<tr>
<th>TEST-PRODUCTS at pH 2.05 +/- 0.05</th>
<th>M.I.I.</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formulation 1 (without hydrogen peroxide and perfume)</td>
<td>&lt; 0.20</td>
<td>Not irritant</td>
</tr>
<tr>
<td>Formulation 2 (with hydrogen peroxide but without perfume)</td>
<td>&lt; 0.20</td>
<td>Not irritant</td>
</tr>
<tr>
<td>Formulation 3 (with hydrogen peroxide and with perfume)</td>
<td>&lt; 0.20</td>
<td>Not irritant</td>
</tr>
</tbody>
</table>

The pH (expressed in \( \log_{10} \)) is the relative measure of the activity of hydrogen ions \( H^+ \) (proton). It is a function of the concentration in protons in a given solution: \( \text{pH} = -\log [H^+] \).

For instance, pH 2 means that the concentration in \( H^+ \) ions is \( 10^{-2} \).

Because the pH measures the total quantity of protons \( H^+ \) in a solution, but not their availability for chemical reactions, the \( pK_a \), or dissociation constant, is a much more important criterion for predictive skin toxicity.

The \( pK_a \) represents the capacity of a chemical to dissociate in water to liberate \( H^+ \) ions, in the case of acids, or \( OH^- \) ions in the case of alkali. The higher this capacity, the stronger the acid or the base. Strong acids and strong alkali in solutions are totally dissociated and this means that all their \( H^+ \) or \( OH^- \) ions are released, and therefore available for chemical reactions (irritation or corrosion in the case of the skin and mucous membranes). On the contrary, weak acids and alkali release a small amount of \( H^+ \) or \( OH^- \) ions. This means that solutions of strong and weak acids may have the same pH but not the same corrosive or irritation potential.

For an acid, for which the dissociation constant is \( K_a \), the reaction with water will be:

\[
HA + H_2O \rightarrow A^- + H_3O^+ \quad K_a = \frac{[A^-][H_3O^+]}{[HA]} \]

As can be seen from the above equations, the stronger the acid, the lower the \( pK_a \). It can also be demonstrated in the same way that the stronger the alkali, the higher the \( pK_b \).

Strong acids have a \( pK_a \) inferior to 0 and strong alkali have a \( pK_b \) superior to 14 since they dissociate completely in water whilst weak acids and alkali are only partially dissociated.

The following figure 1 shows the possible reaction between acids and alkali.

![Acid-alkali reactions diagram](image-url)
Based on the above figure, it is easier to understand that a given acid AH is going to react with the base B, which has a higher energy value and, if it is sufficiently concentrated, it will also react with all alkali situated between B and A; A being the conjugate base of the acid AH. Of course this principle also applies to alkali.

The irritant or corrosive potential of an acidic or alkaline preparation may be predicatedally evaluated by taking into account the pK and the concentration of the components responsible for the pH.

Studies on the eye proved that an acidic or an alkaline solution at a concentration inferior to 0.2N has absolutely no corrosive or even irritant action on the eyes (9).

The following figure 2 shows that an acidic solution with a pK ≥ 3 or or a basic solution with a pK ≤ 10, but at a low concentration (0.2 to 1N), will be irritant to the eyes only (10).

At concentration ≥ 1N, the solution will be corrosive for intermediate pK 4 to 5 or 9 to 10.

And, for pK 5 to 9 and whatever its concentration, the solution will have no effect on eyes.

Therefore, the concept of pK explains why the pH cannot be taken into consideration to evaluate the irritation or the corrosive potential of a preparation. At a given pH, the quantity of free H⁺ or OH⁻ ions may be important (the preparation will be irritant or corrosive) or not (depending on the concentration and/or the contact time, the preparation might be slightly irritant or not at all) (11, 12).

To illustrate this notion even better, we should remember that certain foodstuffs, such as sodas, lemon juice and vinegar have a pH between 2 and 3. These foodstuffs are obviously in frequent contact with the mouth and mucous membranes.

**CONCLUSION**

The perception for product safety is that if the pH of a product is not neutral, it will be an irritant and/or corrosive. In an in vivo 48-hour patch-test skin irritation study involving ten healthy subjects, it was shown that three foaming disinfecting hand soaps, at pH of 2-2.1, with or without hydrogen peroxide and with or without perfume, were non-irritating to the skin. These results are consistent with the theory described in this paper and with a previous in vivo skin irritation study involving ten healthy subjects, it was shown that three foaming disinfecting hand soaps, at pH 3 or 10 and involving weak acids and alkali, were not irritating either.

For weak acids and alkali, as well as for diluted strong acids and bases (< 0.2N), the quantity of H⁺ or OH⁻ free ions, eventually in contact with the skin, is too low to react with the epidermal amino acids and provoke the production of inflammatory mediators (cytokines). Therefore, the pH alone is very poor criteria for predicting the potentially irritant character of a microbical or a cosmetic formulation; physical-chemical characteristics and the concentration of the ingredients, as well as the contact time do matter much more. Also, many ingredients (biocidal agents, surfactants, preservatives, perfumes) have an intrinsic irritating and/or sensitizing power independent of their pH that should be evaluated for selecting and purchasing such products.

**References**


**FIGURE 2: pK and concentration correlation with irritation and corrosion**

![Diagram showing the correlation between pH, pK, and concentration with irritation and corrosion](image-url)
“Application of disinfectants should be preceded by cleaning to prevent inactivation of disinfectants by organic matter”

World Health Organization
Interim Infection Prevention and Control Guidance for Care of Patients with Suspected or Confirmed Filovirus Haemorrhagic Fever in Health-Care Settings, with Focus on Ebola
August 2014
ICRA BEST PRACTICES IN HEALTH CARE CONSTRUCTION

STOP CONTAMINATION IN ITS TRACKS......

The Carpenters union is at the leading edge of new advances in worker training to control risks, minimize hazards and complete projects on time.

Ensure a safe facility and that ICRA protocols are met!

Our highly trained members are your best resource in addressing concerns about HAI!

Carpenters and Allied Workers Local 27
222 Rowntree Dairy Rd
Woodbridge, ON L4L 9T2
Tel: 905-652-4140 Fax: 905-652-4139
Email: organizing@thecarpentersunion.ca or visit us at
www.carpenterslocal27.ca
Inside:

President’s Message
Message de le président
From the Executive Desk
Moira Walker Memorial Award for International Service
NICW Media Release
Champions of infection prevention and control
Diversey Bursary
Virox Scholarship
Distance Education Graduates
ENVIRONMENTAL HYGIENE is a matter of patient safety!

“liberate excellence from within”

Find out how our team can coach your team to improve environmental hygiene outcomes:

Phone: 905-361-8749
Mississauga, ON, Canada
Email: info@hygieneperformancesolutions.com

WEBSITE:
www.hygieneperformancesolutions.com

WHICH IS MORE EFFECTIVE?

The stakes are rising for concerns about patient-safety and stronger “value- for-money” scrutiny on investments in environmental hygiene and infection prevention and control.

Infection Control Professionals are increasingly challenged to make sense of the explosion in new generation technologies, including: (self) disinfecting patient furniture and fabrics, (after clean) secondary disinfection devices (aka “the cleaning robots”), better performing cleaner-disinfectants, and new generation hygiene outcomes monitoring systems. The goal is an environment that is consistently safe, hospitable and ready to support care. The road blocks are the budget, limitations on staff capacity and capability, and the need to push the limit on clinical throughput.

We understand your dilemma; our team of clinical, operational, financial and change management specialists are here to help. Let us design an objective solution and customized path forward that makes sense for your healthcare facility. We work alongside you, your environmental hygiene and administration teams to ensure you reach your desired outcome.

Cleaning Robots?
Magic-Bullet Solutions?
Miracle Surfaces?
Ebola: a new perspective

Over the past few months I’ve read, with growing concern, the reports of the Ebola Virus Disease (EVD) epidemic in West Africa. This is the largest EVD outbreak ever identified and it has been spiraling out of control. The World Health Organization reports to date at least 3000 cases of EVD and over 1500 deaths. Those figures exceed all previous known Ebola cases and deaths combined.

There has been much concern raised both at the provincial and national level in Canada, that we may have potential for cases showing up in our hospitals. This is a real concern. Does it mean we should panic? No, but we need to be ready. Much work has been done; both federal and provincial public health agencies have dusted off and updated their hemorrhagic fever protocols. These plans are good and this work is necessary. We know a lot about this virus. It’s been around since 1976.

The incubation period for EVD is two to 21 days. Patients are not infectious during the incubation period and prior to the onset of symptoms. Person-to-person transmission occurs primarily through direct contact with blood, body fluids, secretions and excretions of someone who is sick or through indirect contact with material contaminated with these substances. Ebola virus is not an airborne pathogen. Healthcare providers (HCP) need to understand this so that they can take proper precautions to protect themselves in the unlikely event that they will be required to provide care for a patient suspected of having EVD.

Some jurisdictional guidance calls for the use of airborne precautions at all times – based on the risk to an HCP from an exposure to this virus being so high. Others suggest that the patients be housed in an airborne infection isolation room (AIIR) in order to avoid the need to move the patient if an aerosol generating medical procedure needs to be performed – but droplet and contact precaution should be applied. The key is that in every situation a point-of-care risk assessment needs to be done by every HCP to ensure that they are applying precautions that will ensure that neither they, their colleagues nor other patients are exposed to this virus.

All of these concerns are a luxury. In Canada we function in a healthcare system where we have the capacity to properly deal with potentially infectious patients. If we were to have a case, they would be provided excellent care and their chances of survival would be good. The likelihood that we will see an epidemic of EVD in Canada is about zero.

Our colleagues in West Africa are not so lucky. Each day they deal with a new tide of suspected EBV cases. They do not have AIIR rooms to isolate these patients – they don’t even have enough beds to house these patients. They don’t argue about what protective equipment needs to be worn, they don whatever they have and hope that they will be protected. Patients withhold information about their potential exposure to EVD in fear that they will be denied care or shunned by their community. My heart goes out to the HCP on the front lines of this outbreak. They are putting their lives on the line to do their best in a nearly impossible situation.

Dr. Joanne Liu, the international president of Medecins Sans Frontieres (MSF) has stated that, “To curb the epidemic, it is imperative that states immediately deploy civilian and military assets with expertise in biohazard containment.” She told the UN, “I call upon you to dispatch your disaster response teams, backed by the full weight of your logistical capabilities. Without this deployment, we will never get the epidemic under control.” Desperate times call for desperate measures. I will watch with interest to see how the various nations of the world respond.

Register Today, Courses fill up quickly!

Infection Prevention and Control: Level 1 Certificate Course
Fall 2014 Registration is Now Open

In Person and Online delivery options available

This 90 hour course offers an up to date, comprehensive and evidence based introduction to basic Infection Prevention and Control (IP&C) Principles. Our experienced instructors use a combination of theory, practical application and facilitated discussion to stimulate and challenge students across the healthcare continuum. This entry level course is geared towards individuals new to IP&C including novice Infection Control Professionals, nurses, Public Health Inspectors, Medical Lab Technologists, Epidemiologists & health care professionals. The course also addresses Hot Topics at the forefront of IP&C including:

- Continuous Quality Improvement
- Patient Safety and Risk Management
- Prevention of Healthcare Acquired Infections
- Screening for Antibiotic Resistance Organisms
- Antibiotic Stewardship
- Healthcare Design

For information and/or registration
Web: www.centennialcollege.ca/parttime
Email: jane.kennedy@centennialcollege.ca
Compliance starts here.

Safer Healthcare Now! includes oral care as part of its VAP Bundle. *Do you?*

The sequential packaging of Q-Care makes it easy to comply with your facility’s oral care protocol.

Contact your Sage sales representative today to learn how Q-Care can help your facility address VAP risk factors. Visit:

www.sageproducts.com/preventinfection
MESSAGE DE LE PRÉSIDENT

Ebola : nouvelle perspective

Je m’inquiète de plus en plus des rapports publiés depuis quelques mois sur l’épidémie de maladie à virus Ebola en Afrique occidentale. C’est la plus vaste flambée recensée à ce jour, et elle échappe à tout contrôle. L’Organisation mondiale de la santé fait état d’au moins 3000 cas à ce jour et de plus de 1500 décès, des chiffres qui dépassent le total de tous les cas et décès connus antérieurement.

Les gouvernements fédéral et provinciaux se préoccupent beaucoup, à raison, du risque de voir un jour des cas surgir dans nos hôpitaux. Il n’y a pas de quoi paniquer, mais il faut être prêt. D’ailleurs, le travail de préparation accompli à ce jour est considérable. Les organismes fédéral et provinciaux de santé publique ont dépoussiéré leurs protocoles de lutte contre la fièvre hémorragique. C’est un travail nécessaire, et ce sont de bons plans.

Nous en savons beaucoup sur ce virus, qui a fait son apparition en 1976. La période d’incubation est de deux à vingt et un jours, au cours desquels les patients ne sont pas contagieux, pas plus d’ailleurs qu’avant l’apparition des symptômes. La transmission entre personnes résulte principalement du contact direct avec le sang, les fluides corporels, les sécrétions et les excrétions d’une personne malade ou du contact indirect avec des objets contaminés par ces substances. Le virus Ebola n’est pas un agent pathogène aéroporté. Les prestataires de soins de santé doivent bien le comprendre pour se protéger comme il se doit dans le cas peu probable où ils devraient traiter un patient soupçonné d’être atteint par le virus.

Certaines organisations prônent des précautions permanentes contre la transmission par voie aérienne, étant donné le risque énorme que pose aux prestataires l’exposition au virus. D’autres suggèrent de confiner les patients à une chambre d’isolement des infections aéroportées pour éviter de les déplacer s’il faut procéder à une intervention respiratoire produisant des aérosols. Mais il faut alors prendre des précautions contre la transmission par gouttelettes ou par contact. L’essentiel est que chaque prestataire de soins évalue les risques au cas par cas, sur les lieux de l’intervention, pour assurer l’application de toute les mesures nécessaires afin d’éviter que quiconque – collègues, autres patients et lui-même – soit exposé au virus.

Toutes ces précautions sont un luxe. Au Canada, les systèmes de santé nous permettent de composer avec des patients potentiellement contagieux. S’il nous arrivait un patient atteint de la maladie à virus Ebola, nous lui prodiguerions d’excellents soins et ses chances de survie seraient bonnes. La probabilité d’une épidémie au Canada est toutefois pratiquement nulle.

Nos collègues d’Afrique occidentale ont nettement moins de chance. Ils voient arriver chaque jour une nouvelle vague de cas présumés. Ils n’ont pas de chambres d’isolement des infections aéroportées. En fait, ils n’ont même pas assez de lits pour accueillir ces patients. Ils ne discutent pas des équipements de protection : ils endossent ce dont ils disposent et espèrent être protégés. Les patients ne parlent pas de leur exposition possible au virus par peur de ne pas être traités ou d’être chassés par leur entourage. J’ai une pensée admiration pour les prestataires de soins qui sont en première ligne devant cette flambée de contagion. Ils risquent leur vie pour les meilleurs soins possibles dans une situation quasi impossible.

Selon la docteure Joanne Liu, présidente internationale de Médecins sans frontières (MSF) : « L’épidémie ne sera pas contenue sans un déploiement massif de ressources civiles et militaires spécialisées dans le confinement des biorisques. » Elle a conjuré les délégués à l’ONU d’envoyer leurs équipes d’urgence et de les doter de tous les moyens possibles faute de quoi, dit-elle, il sera impossible d’endiguer l’épidémie. Des circonstances désespérées commandent des mesures désespérées. Je suis avec intérêt la réponse des diverses nations.

“J’ai une pensée admirable pour les prestataires de soins qui sont en première ligne devant cette flambée de contagion. Ils risquent leur vie pour les meilleurs soins possibles dans une situation quasi impossible.”
Trust the company thousands of healthcare facilities use every day...

Trust Metrex for all your surface disinfection needs.

At Metrex, we strive to continuously improve our products. CaviCide1 now kills Norovirus in just 1 minute and with only 1 step.

Only Metrex™ protects you and your patients across the entire Infection Prevention Circle of Care™.

To learn more about CaviCide1, scan the QR code or visit Metrex.com/IPAC
The Strategic Planning Roadmap

The current IPAC Canada Strategic Plan is effective for the period 2010-2015. It can be viewed online at http://www.ipac-canada.org/Members/pdf/2015StrategicPlan.pdf. The Strategic Plan for 2016-2018 will be developed prior to the 2015 Annual Meeting and will be presented to members for approval at that time.

The Strategic Plan charts the course to guide our organization. It is designed to engage members and association leaders in setting the future for the association and indeed their own profession. The absence of a process that involves environmental scanning, objective setting, strategy development and performance measurements offers no reference point for assessing how effectively resources are being allocated within the organization.

Previously, a Strategic Plan included a number of Objectives and then Action items to complete those objectives. An update and gap analysis arising from the current Strategic Plan was published in the winter 2013 journal. The new Strategic Plan will likely have a different focus from the 2010-15 plan, reflecting the development of the organization and its governance structure. It will be less prescriptive, focusing on high level goals, outcomes and related metrics and allowing more latitude for implementation at the staff and committee level. Additionally, the new Strategic Plan will be for a three-year period, not a five-year period, to better assess results and incorporate new strategies that will keep the plan meaningful.

The board has engaged David Sheridan, BC, MA, PhD to facilitate the 2016-2018 Strategic Plan process. In 2009, Dr. Sheridan facilitated the planning process leading to the association’s current strategic plan and has worked with a range of national and provincial infection prevention and control organizations and networks. Dr. Sheridan notes that: “The proposed approach calls for a well-researched, inclusive and conceptually grounded process leading to a new strategic plan that is relevant, vital, realistic and supported by the association’s internal and external stakeholders.”

A four-stage work plan will include a project launch, environmental scan, strategy development phase and a final report with specific recommendations and provision for follow-up.

Project Launch: Dr. Sheridan will meet with the board in November 2014 to commence the process including review of key informant feedback and an investigation of the current strengths, weaknesses, opportunities and threats facing IPAC Canada (SWOT Analysis).

Environmental Scan: It is necessary that strategic choices are based on an intensive environmental scan and consideration of stakeholder opinions. The environmental scan will consist of an information review (fall 2014 and ongoing), approximately 25 confidential key informant telephone interviews (fall 2014), and an online member survey (early 2015).

Strategy Development: A two-day strategy development session with the IPAC Canada Board, Chapter Presidents, Executive Director and other designated stakeholders will be held as a pre-conference event at the National Education Conference in Victoria. The session will be held on Saturday, June 13 and Sunday, June 14, 2015.

Final Report and Follow-Up: Following the foregoing meeting, a draft strategic plan will be prepared capturing the findings from the environmental scan and the deliberations at the strategy development session. After review by the board, the final proposed 2016-2018 Strategic Plan will be presented to members at the 2015 Annual General Meeting.

IPAC Canada’s new strategic plan will be a living document. The only stable part will be its mission, vision and values. The travel plan to get there will need to be adjusted regularly.

We encourage all members to anticipate their input into the upcoming Strategic Plan, and actively participate in the process.

Resources:
2. David Sheridan, Shercon Associates Inc.

The winner of the 2014 Ecolab Poster Contest is David Ryding. On Page 130 of the Summer CJIC, we inadvertently misspelled David’s last name as “Ryder.” We sincerely apologize to David for this error.
Win the Race to Zero

Putting patient health first – from start to finish

Why choose between effectiveness and safety? With Oxivir®, you can have both! Fast-acting Oxivir® disinfectant cleaners are tough on pathogens, not on people.

Powered by AHP® technology, Oxivir® disinfectant cleaners have the lowest possible toxicity levels and are non-irritating to both eyes and skin. Staff members will appreciate the convenience and safety. With the safest HMIS rating of 0-0-0-0, these products require no personal protective equipment, so you can confidently provide Oxivir® disinfectant cleaners for use in public or patient care areas, empowering visitors to help create safer environments.

Oxivir® products are highly effective against harmful pathogens. Accelerated Hydrogen Peroxide (AHP®) is a patented synergistic blend of commonly used, safe ingredients that, when combined with low levels of hydrogen peroxide, dramatically increases disinfection efficacy and cleaning performance.

This one-step disinfectant acts in just 60 seconds against key healthcare associated pathogens. You no longer need to sacrifice safety for effectiveness. When it comes to delivering responsible cleaning and disinfection, Oxivir® goes the distance. Let Team Target Zero perform for you.

Zero HAIs, Zero Risk and Zero Inefficiency

About the International Service Award
This Award honors an individual or group that has demonstrated extraordinary efforts to bring about change or improvement related to infection prevention and control in parts of the world that are under developed or under resourced. The annual award is in honour of Moira Walker, RN, CIC, a Past President of IPAC Canada (formerly CHICA Canada) and Past Honourary Secretary of the International Federation of Infection Control. Moira’s life was dedicated to enhancing the physical and spiritual health of her many friends and colleagues.

Nomination guidelines

• Who is eligible
  Preferred: Current IPAC Canada members in good standing. The award may be presented to individuals, prior nominees, or a group of individuals, but not past award recipients, who have demonstrated international cooperation in the field of Infection Prevention and Control or Public Health. Fundraising efforts alone will not be sufficient criteria for this award. Lifetime achievement in international service would be considered.

• Who may nominate
  Any member of IPAC Canada or a chapter of IPAC Canada may submit a nomination. The IPAC Canada Board of Directors (the Board) may also nominate candidates. The nomination form is available at www.ipac-canada.org (Opportunities).

• How to nominate
  A completed nomination form and covering letter outlining the nominee’s projects that have resulted in this nomination must be forwarded to the Membership Services Office no later than March 31st of each year.

• Selection process
  The Board will select the recipient(s) through an evaluation process.

Award
Artwork with a First Nations and Inuit art theme. The accompanying engraved plate will announce the recipient’s award. In addition, award winner(s) will be provided with a complete waived registration for the national education conference at which the award is presented. In the case of a group award, one representative of the group will be provided a complete waived registration.

DEADLINE:
The deadline for nominations is March 31, 2015.

Announcement and presentation
The award winner(s) will be advised by April 15th of each year. The award will be presented at the Opening Ceremonies of the IPAC Canada National Education Conference.

---

2015 ECOLAB® POSTER CONTEST

An annual poster contest is sponsored by Ecolab and supported by a chapter of IPAC Canada to give infection prevention and control professionals (ICPs) an opportunity to put their creative talents to work in developing a poster which visualizes the Infection Control Week theme.

YOU ARE INVITED to design a poster that will be used for Infection Control Week 2015 using the following theme:

Infection Prevention:
think global act local

Prize: Waived registration to 2015 IPAC Canada National Education Conference or $500.

REMINDER: Posters should have meaning for patients and visitors as well as all levels of staff in acute care, long term care and community settings. The poster should be simple and uncluttered, with strong visual attraction and few if any additional words. Judging will be 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 IPAC Canada.

HOST CHAPTER: IPAC CENTRAL SOUTH ONTARIO

Send submissions to: info@ipac-canada.org.
Title email : 2015 Ecolab Poster Contest

Deadline: January 31, 2015

Prize: Waived registration to 2015 IPAC Canada National Education Conference or $500.

REMINDER: Posters should have meaning for patients and visitors as well as all levels of staff in acute care, long term care and community settings. The poster should be simple and uncluttered, with strong visual attraction and few if any additional words. Judging will be 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 IPAC Canada.

Send submissions to: info@ipac-canada.org.
Title email: 2015 Ecolab Poster Contest

Deadline: January 31, 2015
At GOJO, we offer a wide range of comprehensive science-based solutions. That’s because we know it takes more than just providing revolutionary and skin-friendly product formulations, like PURELL® Advanced Hand Rub, to reduce the spread of infection and improve patient outcomes. It also takes smart, easy-to-use dispensing platforms and comprehensive, customizable electronic compliance solutions to truly make a difference. When you work with us, you’re aligning your facility with a thought leader that has done the research and knows how to help you increase your compliance. And that will always be our number one goal.

Learn more at GOJOCanada.ca/healthcare.
Infection Prevention – Staying Ahead of the Game!
National Infection Control Week, October 20-24, 2014

Infection Prevention and Control programs are widely recognized as being both clinically effective and cost-effective in preventing and controlling the spread of infections in healthcare settings. Infection Prevention and Control programs protect clients/patients/residents and staff alike by preventing infections before they occur. Such prevention results in better clinical outcomes, fewer healthcare-acquired infections, reduced length of hospital stay, and less antimicrobial resistance, resulting in important cost saving for the health care system.

Ultimately, the most effective way to prevent the transmission of infection is through hand hygiene and effective environmental cleaning. Cleaning your hands is an ordinary procedure and does not take a lot of time and effort. You can use soap and water or alcohol-based hand rub. It takes only 20-30 seconds of your time to clean your hands.

National Infection Control Week will provide Infection Prevention and Control Professionals within healthcare facilities and community settings the opportunity to promote the Infection Prevention – Staying Ahead of the Game! theme. Infection prevention and control professionals will be providing multi-modal education and collaborating with other organizations in order to deliver the message that infection prevention and control can be very simple and is most effective when everyone makes the effort.

Everyone can help prevent the spread of infections by being involved, providing input and initiating change in their own way. Keep in mind that National Infection Control Week is just the beginning. This invaluable lesson is one that must continue to be taught so that the impact of infections can be minimized.

About Infection Prevention and Control Canada
IPAC Canada, formerly CHICA-Canada, is a national, multi-disciplinary, voluntary association of infection prevention and control professionals (ICPs) with 21 chapters across the country dedicated to the health of Canadians by promoting excellence in the practice of infection prevention and control. Visit IPAC Canada’s website (ipac-canada.org) for infection prevention and control information.

Contact the Infection Prevention and Control Professional in your hospital, long-term care facility or community for further information on activities planned for National Infection Control Week. Visit IPAC Canada’s website for infection prevention and control information.

LOCAL CONTACT INFORMATION

LivePerson, Inc. 855-616-3864

FOCUSING ON THE “BIGGER PICTURE” IN HEALTHCARE

Our expertise in developing standards enables us to offer your training solutions vital to helping provide safe, reliable Medical Device Reprocessing Infection Control during Construction & Renovation, Medical Gas Piping programs and Operation & Maintenance of Health Care Facilities.

See a full list of our health care training solutions.
It’s time to make the switch.

Replace your old bedpan washers with a Vortex Macerator.

The Con’s
(of a bedpan washer)

Bedpan washers do not effectively kill C. difficile
- The standard washer disinfection stage is at a temperature of 80°C,¹ this temperature does not adequately eliminate C. difficile spores.²

Washers have high running costs
- The 5-7 minute, hot water cycle generates high utility costs.¹
- Additional equipment may be required to effectively sterilize bedpans.¹

The Pro’s
(of a single-use, closed system)

Infection Control
- Single-use systems are proven to positively impact C. difficile outbreaks.

Efficient Cycle & 100% Recycled
- A cycle that runs on cold water for only 2 minutes, reducing utility costs to $0.08/cycle.
- Disposable products are 100% recycled and biodegradable

Auto Start Function
- A hands free operation that will begin automatically, after the lid is closed

Sources: ¹ AETMIS, Comparative Analysis of Bedpan Processing Equipment, Technical note prepared by Christine Lobe, (AETMIS 09-04) Montreal, 2009. ² AJC Simulated-use testing of bedpan and urinal washer disinfectants: Evaluation of Clostridium difficile spore survival and cleaning efficacy - Alla MJ, Olson N, Buehler-Smith L, Department of Medical Microbiology.

For more information:
1-800-268-2422 • www.vernacare.com
In collaboration with 3M Canada, IPAC Canada has developed the prestigious Champions of Infection Prevention and Control Award. Applications are being accepted for the 2015 Champions of Infection Prevention and Control award. This award will acknowledge the extraordinary accomplishments of the front line Champions of Infection Prevention and Control. The award will recognize IPAC Canada members who work beyond what is expected as part of their employment, tirelessly, and creatively, to reduce infection, raise awareness, and improve the health of Canadians. Awards will be presented at the 2015 National Education Conference in Victoria. Award criteria and nomination form will be posted to www.ipac-canada.org by November 1, 2014. The deadline for 2015 nominations is March 1, 2015.

“This award will acknowledge the extraordinary accomplishments of the front line Champions of Infection Prevention and Control.”
Sterillium® Rub

Your hands will love you even more.

Sterillium® Rub Hand Antiseptic with 80% alcohol content is an effective broad spectrum antiseptic with excellent skin compatibility.

Sterillium® Rub’s balanced emollient blend leaves hands feeling soft and smooth, never greasy or sticky. It dries quickly and leaves no buildup, allowing quicker, easier gloving.

To schedule a free demonstration contact your Medline Representative, call 1-800-396-6996

Increased efficacy.
Incredible comfort.
Improved compliance.
Fragrance Free
Sterillium® Rub.
Bring in a new member
Win a complimentary 2015-2016 membership

Membership has its benefits. The IPAC Canada website (www.ipac-canada.org) has so much information on the benefits of being a member. The member resource guide for finding other IPAC Canada members, links to infection control sites, audit tools … the list is extensive. Tell another infection prevention and control professional (ICP), tell an ID physician, tell your Medical Laboratory Technologist, tell Environmental Services, tell EMS, tell your designate, and tell your director about the benefits of joining our national organization.

If that person joins IPAC by May 1, 2015, both you and the new IPAC Canada member will be eligible to win a complimentary 2015-2016 membership (value $202). You are eligible for the draw with every new IPAC Canada member that you get to sign up. Should the winning members have already paid their 2015-2016 membership, a refund will be made to the person or the institution which has paid the fee.

Send in this form no later than May 1, 2015. An announcement of the winners of this offer will be made at the 2014 conference. Membership applications can be found at http://www.ipac-canada.org/about_join.php.

New member name ____________________________________________________________

Email address ___________________________________________________________________

Sponsoring member ___________________________________________________________________

Email address ___________________________________________________________________

Send this form by fax or email to:
IPAC Canada Membership Services Office | info@ipac-canada.org | Fax: 204-895-9595

Infection Control Starts Here!

Its time to rethink Infection Control!

Re-train your brain!

More than just the best Hand Washing tool, Glo Germ’s Proven technique instantly changes the way people think. The best line of defense is not spreading microbes.

Learn more with Glo Germ! The life you save could be your own!
IPAC Canada and SealedAir Diversey Inc. have collaborated on the establishment of the Diversey Education Bursary. The objective of the Bursary is to provide financial assistance to eligible IPAC Canada members to attend continuing professional education programs. With the need for increased funding for IPAC Canada members to attend or participate in educational events, the sponsorship of this bursary by Diversey Inc. enhances IPAC Canada’s ability to support its members in attendance at the annual conference, at a chapter educational event, or as a student at one of the distance education courses supported or endorsed by IPAC Canada.

“We are delighted to partner with IPAC Canada to provide this education bursary, which advances our joint objective – promoting best practice in infection prevention and control to improve patient and staff safety,” said Carolyn Cooke, Vice President, North America Healthcare Sector. “We see continuing education and shared knowledge as cornerstones to improving patient outcomes and program quality, and we are proud to partner with IPAC Canada to be able to provide an opportunity for increased learning and knowledge sharing.”

The 2015 Diversey Education Bursary will be online in November 2014. The deadline date for applications is January 31, 2015.

---

GAMMEX® Non-Latex Antimicrobial gloves are not proven to protect against blood-borne infections where the skin is broken, cut or punctured.

® and ™ are trademarks owned by Ansell Limited or one of its affiliates. © 2014 Ansell Limited. All rights reserved.


Learn more about a new level of protection. Visit www.ansellhealthcare.com/gammex
Through the financial support of Virox Technologies, 16 IPAC Canada members were awarded scholarships to attend the 2014 CHICA National Education conference in Halifax. IPAC Canada and its members thank Virox Technologies for their initiative to make the national education conference accessible to those who may not have otherwise been able to attend.

In partnership with IPAC Canada, Virox Technologies will again provide scholarships to assist IPAC Canada members with attending the 2015 National Education conference in Victoria (June 14-17, 2015). The 2015 Virox Technologies Scholarship online application will be launched in November 2014. The deadline for applications is January 31, 2015.

“IPAC Canada and its members thank Virox Technologies for their initiative to make the national education conference accessible to those who may not have otherwise been able to attend.”

Contact your local Ansell Representative today at 1-800-363-8340 for samples, and to schedule a consultation. Or visit www.ansellhealthcare.com/gammexca for more information.

1. Infection control practices, including proper hand hygiene, such as those recommended by the CDC, must be adhered to during the use of this glove.

2. Test data available upon request. ™ and ® are trademarks owned by Ansell Ltd. or one of its affiliates.

© 2013 Ansell Ltd. All rights reserved. US and non-US Patents Pending. www.ansell.com/virtual-patent-marking
Medical surface repair patch for hospital beds and stretchers.
Restores damaged mattresses to an intact and hygienic state.

**PREVIOUS ALTERNATIVES**

- **Replace Mattress**
  - ✓ Validated
  - x Unaffordable
  - x Inconvenient

- **Repair with tape**
  - ✓ Inexpensive
  - x Not durable
  - x Leaves sticky mess

- **Do Nothing**
  - x Risk patient safety

**This is now.....**

- **WHY CLEANPATCH™?**
  - **Clinically Tested**
    - Durable and impervious to fluids
    - Does not promote bacterial growth
    - Fully cleanable with disinfectants
  - **Safe and Simple**
    - Improves patient safety
    - Latex free and biocompatible
    - Peel and stick, applies in seconds
  - **Cost Effective**
    - Extends the life of mattresses
    - Significant savings versus replacement

*CLEANPatch should be used as part of a mattress inspection & repair program. For more information and resources, please visit [www.cleanpatch.ca](http://www.cleanpatch.ca)*

**Surface Medical Inc.**
Made in Canada

**The results are in!**

Furniture covered in seamless IC+ Upholstery Solution is proven to be more effectively cleaned than seamed hospital grade vinyl.*

VS

Hospital Grade Vinyl
0.4 Log Reduction

3 Log Reduction

**If you can’t clean it, don’t buy it.™**

Read the results at:
[www.healthHcentric.com/IPAC](http://www.healthHcentric.com/IPAC)

*Based on independent laboratory testing.
Distance education graduates

IPAC Canada congratulates the graduates of the 2013-2014 Distance Education Online Novice Infection Prevention and Control Course. The following group of graduates have successfully completed the course. This course also provides IPAC Canada members with the opportunity to share their expertise in the roles of coordinators, instructors and discussion facilitators. Many thanks go to the faculty of the course and to the families and colleagues of the students for making it all possible for students to strengthen their knowledge and skills. We know that they are ready and eager to apply them to practice.

Congratulations and best wishes to:

- Abeer Ahmad, Toronto, ON
- Adesegun Akintude, Saskatoon, SK
- Kim Barnes, Kelowna, BC
- Laurel Biluk, Gimli, MB
- Sean Brown, Barrie, ON
- Cristina Cabotaje (Ma), Mississauga, ON
- Adele Coulter, Owen Sound, ON
- Jerry Devries, Slate River, ON
- Gladys Ens, Springstein, MB
- Sherilyn Fenwick, Melville, SK
- Krystal Fergus, Kelowna, BC
- Kelly Fishleigh, Cambridge, ON
- Danielle Gerick, Nanaimo, BC
- Polly Griesbach, Oakville, ON
- Delores Kennedy, Burns Lake, BC
- Stanley Kolodziej, Edmonton, AB
- Anne Mason, Dartmouth, NS
- Elaine McDougall, Morris, MB
- Sandra McKechnie, Penticton, BC
- Christine Mochid, Morinville, AB
- Lorel Morrison, Corbyville, ON
- Hitesh Patel, Calgary, AB
- Larysa Polinko, Mississauga, ON
- Nisha Samuel, Markham, ON
- Julie Servant, Sexsmith, AB
- Linda Sonneveld, London, ON
- Karen Webster, Aurora, ON
- Annjanette Weddell, Edmonton, AB
- Sarah Wells, Burnaby, BC
- Lori Wilson, Thunder Bay, ON
- Janelle Yakimishen, Dauphin, MB

The following students have graduated from the IPAC Canada Distance Education Course that was held in collaboration with Alberta Health Services:

- Tamalee Andersen, Fort McMurray, AB
- Remi Bolarinwa, Edmonton, AB
- Judy Evans, St. Albert, AB
- Yvette Gable, Edmonton, AB
- Danielle Halaburda, AB
- Kim Houde, Calgary, AB
- Kathy Jarema, Edmonton, AB
- Jenean Johnson, Red Deer, AB
- Dione Kołodka, Calgary, AB
- Sandra MacIsaac, Lethbridge, AB
- Emily Maclean, Lethbridge, AB
- Blair Ranns, Peace River, AB
- Gisele Saulnier, Edmonton, AB
- Joy Scott, St. Albert, AB
- Jian Sun, Edmonton, AB
- Leeanne Van Rootselar, Calgary, AB
- Ashley Van Ryn, Lethbridge, AB
- Rauj Walia, Calgary, AB
- Michelle Zwicker, Edmonton, AB

For more information on upcoming course offerings, see IPAC Educational Opportunities on the website.

2013-2014 Faculty

- Heather Candon, BSc, MSc, CIC, Course Coordinator
- Jane Van Toen, MLT, BSc, CIC, Course Coordinator
- Jill Richmond, BA, RN, BN, CIC, Practicum Coordinator
- Kathy Bush, MSc, MLT, Instructor
- Tara Leigh Donovan, BHSc, MSc, Instructor
- Laura Fraser, RN, BScN, CIC, Instructor
- Leila Kipke, MLT, Instructor
- Sue Laflerty, RN, BScN, CIC, Instructor
- Lesley McLeod, BSc, MSc, CIC, Instructor
- Deb Paton, RN, BScN, CIC, Instructor
- Sharon Wilson, RN, BScN, CIC, Instructor
- Anne Augustine, MLT, CIC, Facilitator
- Lori Jessome-Croteau, RN, BScN, MHS, CIC, Facilitator
- Tina Stacey-Works, MLT, CIC, Facilitator
- Jill Richmond, BA, RN, BN, CIC, Facilitator
MEIKO’s TopLine healthcare cleaning and disinfection appliances represent a quantum leap in design, using cutting-edge technology that promotes cleanliness, efficiency, and environmental friendliness.

MEIKO’s TopLine offers:
- Integrated disinfection management
- Telescopic rotary nozzle with nine auxiliary nozzles
- Deep-drawn stainless steel wash chamber
- Steam-tight door with interlock
- Air gap potable water protection
- MIKE 2 microprocessor control
- Illuminated display
- Infrared interface for Palm® PDA
- Three programmable wash/disinfection cycles
- External temperature port for temperature verification
- Air stream cooling and drying system
- Optional automatic door opener
Inaugural Conference
Delta Hotel | RBC Convention Centre
Winnipeg, MB
October 16 - 19, 2014
Register at www.CAMDR.ca

Complimentary Session Recordings for All Attendees through the
IPAC Canada Live Learning Centre

IPAC Canada is excited to launch its newest educational resource, the IPAC Canada Live Learning Centre. This online portal connects you to recordings of our most anticipated sessions from the 2014 National Education Conference. Catch up on sessions you miss, review industry education and continue your professional development between IPAC Canada conferences.

All 2014 National Education Conference attendees will receive complimentary access to this resource. You will be notified post-conference when sessions have been posted online.

NEW for 2014

Be an author for IPAC Canada

Contact Chingiz Amirov,
Editor-in-Chief, at camirov@baycrest.org

LEARN MORE. TALK TO YOUR DOCTOR, NURSE, PHARMACIST OR LOCAL PUBLIC HEALTH OFFICE TODAY, OR VISIT: IMMUNIZE.CA
This journal would not be possible without the advertising support of the following companies and organizations. Please think of them when you require a product or service. You can also access the electronic version at www.ipac-canada.org.

<table>
<thead>
<tr>
<th>Company</th>
<th>Page</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMG Medical Inc.</td>
<td>IBC</td>
<td>(800) 361-2210</td>
<td><a href="http://www.medprodefense.com">www.medprodefense.com</a></td>
</tr>
<tr>
<td>Accreditation Canada</td>
<td>160</td>
<td>(800) 814-7769 x258</td>
<td>accreditation.ca/advisory</td>
</tr>
<tr>
<td>Ansell</td>
<td>182,183</td>
<td>(800) 363-8340</td>
<td><a href="http://www.ansellhealthcare.com/gammex">www.ansellhealthcare.com/gammex</a></td>
</tr>
<tr>
<td>Association for Professionals in Infection Control &amp; Epidemiology, Inc.</td>
<td>179</td>
<td>(202) 789-1890</td>
<td><a href="http://www.apic.org">www.apic.org</a></td>
</tr>
<tr>
<td>Carpenters &amp; Allied Workers Local 27</td>
<td>166</td>
<td>(905) 652-4140</td>
<td><a href="http://www.carpenterslocal27.ca">www.carpenterslocal27.ca</a></td>
</tr>
<tr>
<td>Centennial College</td>
<td>169</td>
<td>(416) 289-5000</td>
<td><a href="http://www.centennialcollege.ca">www.centennialcollege.ca</a></td>
</tr>
<tr>
<td>Coughshield</td>
<td>159</td>
<td>844-799-2228</td>
<td><a href="http://www.coughshield.com">www.coughshield.com</a></td>
</tr>
<tr>
<td>CSA Group</td>
<td>177</td>
<td>(877)223-8480</td>
<td><a href="http://www.Shop.csa.ca">www.Shop.csa.ca</a></td>
</tr>
<tr>
<td>Diversey, Inc.</td>
<td>174</td>
<td>(800) 558-2332</td>
<td><a href="http://www.diversey.com">www.diversey.com</a></td>
</tr>
<tr>
<td>ECOLAB Healthcare</td>
<td>OBC</td>
<td>(800) 352-5326</td>
<td><a href="http://www.ecolab.com/healthcare">www.ecolab.com/healthcare</a></td>
</tr>
<tr>
<td>Fraser Health</td>
<td>143</td>
<td>(866) 837-7099</td>
<td>careers.fraserhealth.ca</td>
</tr>
<tr>
<td>Glo Germ</td>
<td>181</td>
<td>800-909-3507</td>
<td><a href="http://www.germwise.com">www.germwise.com</a></td>
</tr>
<tr>
<td>GOJO Canada, Inc.</td>
<td>176</td>
<td>(800) 321-9647</td>
<td><a href="http://www.GOJOCanada.ca">www.GOJOCanada.ca</a></td>
</tr>
<tr>
<td>HealthCentric</td>
<td>184</td>
<td>(866) 438-3746</td>
<td><a href="http://www.healthCentric.com/IPAC">www.healthCentric.com/IPAC</a></td>
</tr>
<tr>
<td>Hygiene Performance Solutions</td>
<td>168</td>
<td>(905) 361-8749</td>
<td><a href="http://www.hygieneperformancesolutions.com">www.hygieneperformancesolutions.com</a></td>
</tr>
<tr>
<td>Medco Equipment</td>
<td>144</td>
<td>(800) 717-3626</td>
<td><a href="http://www.medcoequipment.com">www.medcoequipment.com</a></td>
</tr>
<tr>
<td>Medline Canada Corporation</td>
<td>180</td>
<td>(800) 396-6996</td>
<td><a href="http://www.medline.ca">www.medline.ca</a></td>
</tr>
<tr>
<td>Metrex Corp.</td>
<td>172</td>
<td>(800) 841-1428</td>
<td><a href="http://www.metrex.com">www.metrex.com</a></td>
</tr>
<tr>
<td>MIP Inc.</td>
<td>184</td>
<td>(800) 361-4964</td>
<td><a href="http://www.mipinc.com/reward">www.mipinc.com/reward</a></td>
</tr>
<tr>
<td>Polaris Medical, Inc.</td>
<td>Insert</td>
<td>(877) 377-9988</td>
<td><a href="http://www.polarismedicalinc.com">www.polarismedicalinc.com</a></td>
</tr>
<tr>
<td>Process Cleaning Solutions</td>
<td>165</td>
<td>877-745-7277</td>
<td><a href="http://www.processcleaningsolutions.com">www.processcleaningsolutions.com</a></td>
</tr>
<tr>
<td>Retractable Technologies, Inc.</td>
<td>138</td>
<td>(888) 703-1010</td>
<td><a href="http://www.vanishpoint.com">www.vanishpoint.com</a></td>
</tr>
<tr>
<td>Sage Products, LLC</td>
<td>170</td>
<td>(800) 323-2220</td>
<td><a href="http://www.sageproducts.com/preventinfection">www.sageproducts.com/preventinfection</a></td>
</tr>
<tr>
<td>Surface Medical Inc.</td>
<td>184</td>
<td>(888) 623-7085</td>
<td><a href="http://www.cleanpatch.ca">www.cleanpatch.ca</a></td>
</tr>
<tr>
<td>The Clorox Company of Canada Ltd.</td>
<td>137,140</td>
<td>(866)-789-4973</td>
<td><a href="http://www.cloroxprofessional.ca">www.cloroxprofessional.ca</a></td>
</tr>
<tr>
<td>The Stevens Company Limited</td>
<td>142,186</td>
<td>(800) 268-0184</td>
<td><a href="http://www.stevens.ca">www.stevens.ca</a></td>
</tr>
<tr>
<td>Vernacare Canada Inc.</td>
<td>178</td>
<td>(800) 268-2422</td>
<td><a href="http://www.vernacare.com">www.vernacare.com</a></td>
</tr>
<tr>
<td>Virox Technologies Inc.</td>
<td>IFC</td>
<td>(800) 387-7578</td>
<td><a href="http://www.virox.com">www.virox.com</a></td>
</tr>
</tbody>
</table>

To reach infection control professionals across Canada through the **Canadian Journal of Infection Control** and its targeted readership, please contact me at

**Al Whalen, Marketing Manager 1-866-985-9782  awhalen@kelman.ca**
To break the cycle of infection, choose Haigh® macerators.

You may already know that Haigh® macerators represent a simple yet reliable way to reduce the handling of human waste. In fact, if your facility uses macerators, chances are they were designed and manufactured by Haigh® Engineering (names like the Solo®, the 400 Series or the Multi). But did you know that Haigh® macerators are now part of the MedPro Defense® family of infection control products?

When choosing to partner with Haigh® Engineering, we combined gold standard products with the exceptional customer support. This means that you can still get the macerators you trust, now backed by the experts in infection control that brought you other innovations such as the Nocospray® disinfection system and DermaFresh® pre-soaped gloves and sponges. What’s more, we now offer the latest Haigh® innovation, the Incomaster, which allows you to dispose of incontinence products such as briefs and pads with the push of a button.

So for all new macerator installations, keep trusting the gold standard: Haigh® by MedPro Defense®.

Visit us or the web: www.medprodefense.com
Or call us at 1.800.363.2381
Hand Hygiene Dispensing Technology for the Modern Hospital

Ecolab’s newest hand hygiene dispensing platform delivers everything you’ve asked for in a hand hygiene dispenser – improved efficiency, safety, simplicity and sustainability.

The Nexa platform can dispense an array of Ecolab hand hygiene products, including liquid and foam hand soaps, lotions, hand sanitizers and body shampoos, all from the same unit, making product change-outs easy.

Nexa’s simple design supports easy product identification with color-coded badges and language-free icons and better inventory management through the ability to hold both large and small product bottles, which fit into both the manual and touch-free units.

For more information: 800 352 5326 or www.ecolab.com/healthcare