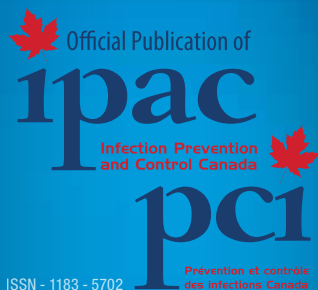


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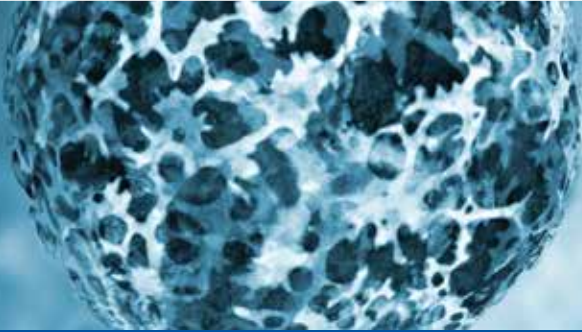


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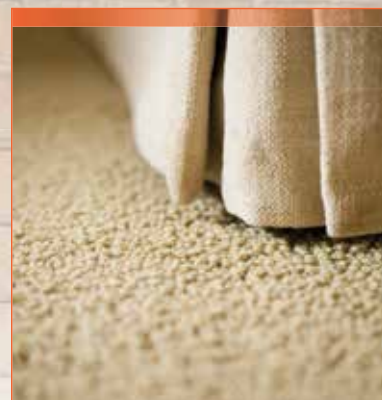


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What can an audit of national surveillance data tell us? Findings from an audit of Canadian vancomycin-resistant enterococci surveillance data

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ABSTRACT

Background

The Canadian Nosocomial Infection Surveillance Program (CNISP) has conducted surveillance for vancomycin-resistant enterococci (VRE) in sentinel hospitals since 1999. In 2010, a reliability audit of the 2008 data was conducted.

Methods

Stratified random sampling was used to obtain a proportional sample of VRE case forms submitted in 2008 from 36 CNISP hospitals. The original VRE data were compared to re-abstracted data for congruence on 16 pre-selected variables. Any discrepancy between the original and re-abstracted data was identified as a discordant response.

Results

Re-abstracted data were received from 35 out of 36 hospitals, providing 98% (n=428) of the 437 case forms requested. Of these, 37% (n=157) had zero discordant responses, 29% (n=126) had one discordant response, 16% (n=70) had two discordant responses and two forms (0.5%) had eleven discordant responses. Among the 35 hospitals, one hospital (3%) submitted forms with no discordant responses. Overall, the percentage of discordant and missing responses was 5%, ranging from 1% (n=29) for type of infection to 22% (n=93) for previous hospitalization.

Conclusions

Overall case forms were complete. However, discordant responses were more likely for variables that require interpretation and judgment or using historical data. Clearly defining variables and providing applicable response

options may improve data quality. As well, the implementation of electronic health records may also improve the reporting of historical data.

KEY WORDS

data quality, surveillance,
 vancomycin-resistant enterococci,
 CNISP

INTRODUCTION

Recent data show that the burden of vancomycin-resistant enterococci (VRE) in Canadian acute-care hospitals remains low, yet infection rates have been rapidly increasing since 2008, with regional variation. This trend has also been observed in several European countries as well as the United States (1). VRE remains an important hospital-associated pathogen. Higher morbidity, mortality and excess healthcare costs are associated with VRE infections (2-3). VRE infection generally follows colonization with these microorganisms (4). VRE colonization can last for months (4), which makes tracking VRE colonizations through surveillance an important indicator for infection prevention and control (5-6).

Since 1999, the Public Health Agency of Canada (Agency) in collaboration with the Canadian Hospital Epidemiology Committee (CHEC), a sub-committee of the Association of Medical Microbiology and Infectious Disease (AMMI) Canada, has conducted surveillance for incident VRE cases through the Canadian Nosocomial Infection Surveillance Program (CNISP) in order to monitor the spread and burden of VRE in Canadian hospitals. For each case identified by the hospital's laboratory, a standardized patient questionnaire is completed through concurrent or retrospective chart review by an infection control

TABLE 1. Surveillance questions and responses assessed for reliability

Variable	Surveillance question and response options	Rules
Date of birth	Patient's date of birth	dd-mmm-yyyy
Date of admission	When patient admitted to the hospital?	dd-mmm-yyyy
Sex	Patient's sex: Male or Female	Select only one
Previously known to be VRE carrier	Was patient previously known to be a VRE carrier in a non-CNISP hospital? Yes, No or Unknown	Select only one
Previous care in past 12 months	In the past 12 months, did patient receive care in any healthcare institutions? Yes, No or Unknown	Select only one
Date of positive culture	Date of this patient's first positive VRE culture?	dd-mmm-yyyy
Reason for specimen collection	Why was first culture done? Admission screen, Other screening Clinical isolate or Other	Select only one:
Other reason for specimen collection	Description of "other" reason for specimen collection in previous question	Specify other reason for specimen collection
Location of VRE acquisition	Where was VRE acquired? Healthcare associated - your facility Healthcare associated - another acute-care facility Healthcare associated - a long-term care facility Healthcare associated - another healthcare exposure Community-associated Unknown	Select only one
Site of collected specimen	At which site(s) has VRE been isolated? Blood, Surgical wound, Skin or soft tissue/burn, Urine, Rectum/stool/ileostomy/ colostomy, Other	Select all that apply
Other site of collected specimen	Description of "other" site of collected specimen in previous question	Specify other site of positive culture
Severity of VRE	Was the positive culture infected or colonized	For each site(s) selected from the list in the previous question, indicate whether the site was infected or colonized
Type of infection	If infected, what type of infection Urinary tract infection, Catheter-associated bloodstream infection Bloodstream infection, source unknown, Post-surgical soft tissue infection, Other	Select all that apply
Other type of infection	Description of "other" infection in previous question	Specify other infection

practitioner. Patient demographics, clinical and laboratory information, as well as risk factor data are collected and submitted to the Agency.

At its inception, the CNISP VRE surveillance system used a flat-file Epi-Info (Centers for Disease Control and Prevention, Atlanta, GA) based database (1998-2001), then moved to a relational system, Microsoft Access (Microsoft Inc., Redmond, WA) (2002-2007). In 2008, data entry was switched to an internet-based

system developed by the Canadian Network for Public Health Intelligence (CNPHI). Over the course of the entire program, data have been entered and validated by the Agency. With the introduction of the CNPHI secure web-based application, data entry is now performed by participating CNISP hospitals as well as the Agency.

Quality assurance is a key component of surveillance. Studies have shown that human error in the interpretation, selection and recording of data may

introduce error into surveillance results, thereby reducing their reliability, accuracy and completeness (7). Valuable information to help determine which variables are accurate and reliable, which variables are clinically important but poorly collected, and which variables are unreliable with little opportunity for improvement in data accuracy can be obtained from regularly performed data quality audits (7-8).

In 2008, a reliability audit of the 2005 CNISP methicillin-resistant

TABLE 2. Sampling methodology for reliability audit

Response rate	Total representative sample size required*		
	Infection	Colonization	Total
100% response rate	69	368	437
85% response rate	59	313	372
65% response rate	45	239	284
50% response rate	35	184	219
Cases submitted	111	3093	3204

*Representative sample size required was also calculated for each hospital that submitted VRE data
Response rate sample size formula = $N/(1 + (N/\text{population}))$
Population = # of infected cases at each hospital
 $N = Z^2 P(1-P)/(D^2)$
P = Expected frequency value = 95%
D = Expected frequency - Worst acceptable = 95% - 85% = 10%; X = 1.96 with a confidence level of 95%
Z = Area under normal curve corresponding to the desired confidence level
Confidence Level/ Value for Z set at 95% = 1.960

Staphylococcus aureus (MRSA) data was performed (9). Recommendations from the previous MRSA data quality audit (9) were incorporated into the development of CNISP modules on the CNPHI platform for data entry and reporting. Built into this Internet-based CNPHI application are quality checks that ensure that criteria are met, nonsensical data are not submitted, and the functionality of not allowing incomplete records to be saved was added. The application prompts users for correction or confirmation of missing data via screen displays. This application is similar to the National Healthcare Safety Network system (6). In response to the implementation of an Agency data quality framework, a reliability audit of the 2008 VRE data was conducted in 2010. The principal objective of this audit was to assess the reliability of the 2008 VRE data. Secondary objectives were to describe the type, frequency and possible causes of discordant and missing responses between original and re-abstracted data; and to make recommendations for improving data quality.

METHODS

The assessment of agreement between the original data submission (paper forms entered into CNPHI by one data entry person) and re-abstracted data collected from the original patient chart was the primary method used in this reliability audit. A discordant response

was identified to be any discrepancy between the original data submission and the re-abstracted data. As in the previous reliability audit of MRSA data (9), reliability was defined as the level of agreement between multiple raters when evaluating the same subject (VRE data) and using the same measurement tool (case forms).

Variables selected for the audit

The 2008 VRE database comprised 22 variables, including demographic, admission and case identification data, and information on the severity of the VRE infection or colonization and where the infection or colonization was most likely acquired. Fourteen of the variables were categorical, three were dates, two were alpha-numeric, and three were free text. For this audit, 16 variables were selected for re-abstractation and were selected to evaluate the reliability of different types of variables and focused on variables most prone to error and those most likely to have a reliable data source. The 16 variables included three date variables (date of birth/age, date of admission, and date of positive culture), eight categorical variables (sex, previously known to be VRE carrier, previous hospitalizations in past 12 months, reason for specimen collection, location of VRE acquisition, site of collected specimen, severity of VRE, and subsequent infection type), two alpha-numeric variables

(hospital identification number and case identification number), and three free text variables (description of other site of collected specimen, description of other reason for specimen collection, and description of other type of subsequent infection). Two of the variables (specimen collection site and severity of VRE) allowed for the selection of multiple response options (six response options were available, with each response option evaluated as a separate data field). Thus, the 16 variables included in the audit represent a total of 26 data fields. Table 1 presents the surveillance questions for each of these variables, along with the associated response options.

Sampling strategy

A random sampling scheme was developed with the aim of achieving a representative sample of the total number of original case forms submitted, stratified by whether the cases were infected or colonized. In 2008, 3,204 VRE surveillance forms were submitted to the CNISP from 26 hospitals, with the number of forms per site ranging from 1 to 765. The expected data entry accuracy and completeness rate was set at 95% and the worst acceptable rate was set at 85%. After determining the number of cases to be audited at each hospital, a randomly generated computerized list of infected and colonized cases to be audited

FIGURE 1. Number of forms by number of discordant responses (n = 428)

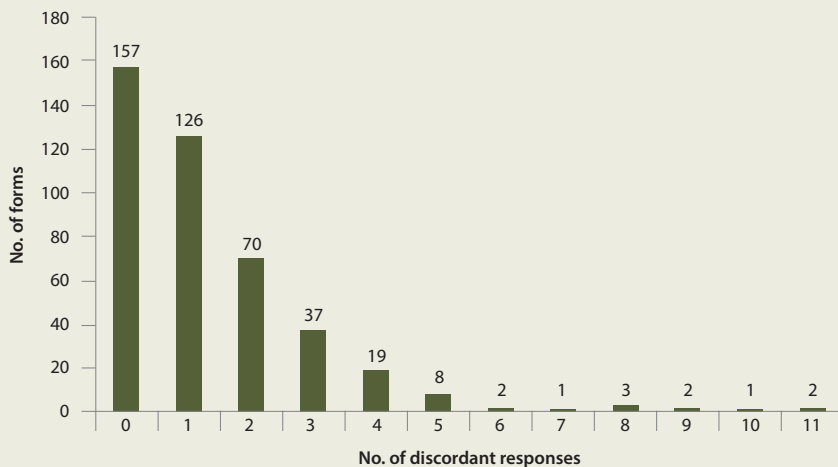
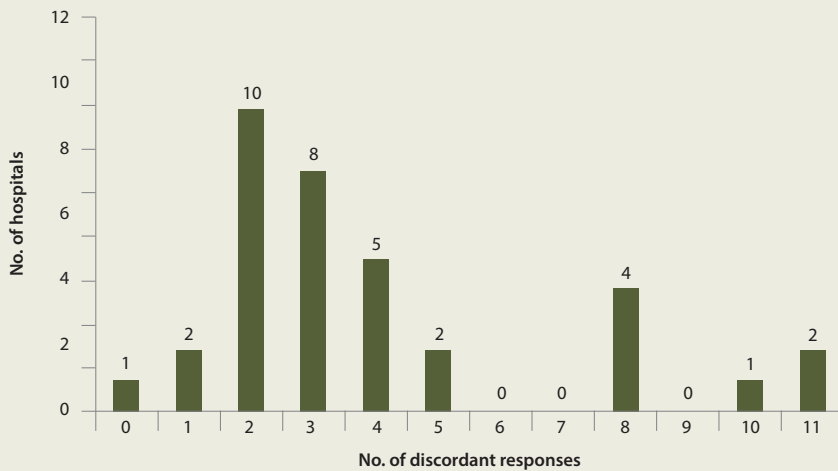


FIGURE 2. Number of hospitals by number of discordant responses (n = 35)



was produced using the unique case identification number. Table 2 presents the sampling methodology and the number of forms used in the analysis.

Data collection

The unique patient identification numbers listed on the original submitted forms were provided to sites for data re-abstraction. In addition, data collection forms and a protocol with the 2008 data definitions were distributed to the hospital in April 2010, with data submission requested by end of June 2010. Where possible, the audit protocol required that individuals other than the person who completed the initial abstraction conduct the second abstraction. Re-abstracted data were collected by Infection Control Professionals. All re-abstracted data were manually entered into a Microsoft Access

(Microsoft Inc. Redmond, WA) database containing a sample of original data to permit analysis.

Data analysis

Discordant and missing responses for each variable studied were calculated. In addition, discordant responses were further described by number of hospitals and number of forms. All analyses were performed using Excel (version 2007).

RESULTS

Re-abstracted data were received from 35 of the 36 hospitals (98%), with 428 of the 437 forms requested (97%). Figure 1 illustrates that 157 forms (37%) contained zero discordant responses, whereas two forms (0.5%) contained eleven discordant responses.

The distribution of hospitals based on the number of discordant responses is illustrated in Figure 2. For example, ten hospitals (29%) submitted forms with two discordant responses. Overall, 28 hospitals (80%) submitted forms with five or fewer discordant responses, whereas six hospitals (17%) submitted forms with eight or more discordant responses.

Overall, the percentage of discordant and missing responses was 4%, ranging from 1% (n=2) for type of infection to 22% (n=93) for previous hospitalizations. The proportion of missing original data was very low, 0% for the original data and 0.1% for the re-abstracted data. Table 3 illustrates the distribution of discordant and missing responses by data field examined.

Date of birth or age and sex

Seventy-eight (18%) discordant responses were identified for the “date of birth” or “age” variable. Due to individual hospital confidentiality policies, some hospitals are unable to provide date of birth due to privacy legislation, so age is provided. For those that are able to provide a date of birth, age is calculated. Seven (2%) discordant responses were identified for the “sex” variable.

Date of admission and date of positive culture

Thirty-six (8%) discordant responses were identified for the “date of admission” variable, and 31 (7%) for the “date of positive culture” variable. For both variables, the discrepancies occurred in the month and day options.

Prior VRE carrier and previous hospitalizations

For the variable “patient previously known to be a VRE carrier in a non-CNISP hospital”, 56 (13%) discordant responses were identified, and 93 (22%) discordant responses were identified for previous hospitalizations in the past 12 months.

Reason for specimen collection

Sixty-one (14.3%) discordant responses were identified for the “reason for specimen collection” variable. Common misclassifications were noted between screening options – admission screen versus other screening.

TABLE 3. Distribution of discordant and missing responses by variable

Variable	Data fields N	Discordant responses N (%)	Missing responses finalized N (%)	Missing responses reabstracted N (%)	Total N (%)
Date of birth OR Age	428	77 (18.0)	0	1 (0.2)	78 (18.2)
Date of admission	428	35 (8.2)	0	1 (0.2)	36 (8.4)
Sex	428	5 (1.2)	0	2 (0.5)	7 (1.6)
Patient previously known to be VRE carrier in non-CNISP hospital	428	53 (12.4)	0	3 (0.7)	56 (13.1)
Patient hospitalized in past 12 months	428	90 (21.0)	0	3 (0.7)	93 (21.7)
Date of positive culture	428	30 (7.0)	0	1 (0.2)	31 (7.2)
Reason for specimen collection	428	60 (14.0)	0	1 (0.2)	61 (14.3)
Location of VRE acquisition	428	28 (6.5)	0	1 (0.2)	29 (6.8)
Site of collected specimen	2,568	66 (2.6)	0	1 (0.0)	67 (2.6)
Blood	428	4 (0.9)	0	0	4 (0.9)
Surgical wound	428	9 (2.1)	0	0	9 (2.1)
Other skin or soft tissue	428	5 (1.2)	0	0	5 (1.2)
Urine	428	11 (2.6)	0	0	11 (2.6)
Rectum/stool/ileostomy/colostomy	428	28 (6.5)	0	0	28 (6.5)
Other	428	9 (2.1)	0	0	9 (2.1)
Description for "other" specimen	428	9 (2.1)	0	0	9 (2.1)
Infection or colonization of specimen	2,568	43 (1.7)	0	0	43 (1.7)
Type of infection	2,140	27 (1.3)	1 (0.0)	1 (0.0)	29 (1.4)
Urinary tract infection	428	9 (2.1)	0	0	9 (2.1)
Catheter-associated bloodstream infection	428	2 (0.5)	0	0	2 (0.5)
Bloodstream infection, source unknown	428	3 (0.7)	0	0	3 (0.7)
Post-surgical soft tissue infection	428	2 (0.5)	0	0	2 (0.5)
Other	428	11 (2.6)	0	0	11 (2.6)
Description for "other" infection	428	15 (3.5)	0	0	15 (3.5)
Infection of colonization status	428	15 (3.5)	0	0	15 (3.5)
Overall	20,972	797 (3.8)	1 (0.0)	16 (0.1)	814 (3.9)

Location of VRE acquisition

The location of VRE acquisition variable had 29 (7%) discordant responses.

Site of specimen collection

A total of 67 (3%) discordant responses were identified for the "site of specimen collection variable." Twenty-eight (7%) were for rectum/stool/ileostomy/colostomy, 11 (3%) were for urine, 9 (2%) were for surgical wound, 9 (2%) were for other site of infection, 5 (1%) were for other skin or soft tissue, and four (0.9%) were for blood. Nine (2%) discordant responses were identified for description of "other" site of specimen collection.

Infection or colonization of specimen

Forty-three (2%) discordant responses were identified for "infection or colonization of specimen" variable.

Type of infection

For the "type of infection" variable, 29 (1%) discordant responses were identified. Nine (2%) were urinary tract infections, 3 (0.7%) were for unknown source bloodstream infections, 2 (0.5%) were for catheter-associated bloodstream infections, 2 (0.5%) were for post-surgical soft tissue infections, and 11 (3%) were for "other" infection. Fifteen (4%) discordant responses were identified for description of "other" type of infection

DISCUSSION

Similar to our audit of CNISP MRSA surveillance data (9), this audit suggests the 2008 VRE data are reliable. The audit methodology worked well and showed that CNISP sites maintain accurate logs of case identification numbers. The proportion of missing original data was very low (0% for the finalized original data and 0.1% for the re-abstracted data), most likely due to post-submission data cleaning and verification by the Agency. Missing data (from either the original data or reabstracted data) may be due to data missing from the original extraction source (i.e., patient chart). Well-defined variables had fewer discordant responses than those that required clinical judgement and interpretation. Previous

studies examining the reliability of surveillance systems and registries have also reported that discordance appears to be associated with variables that require both interpretation and clinical judgement (7-8, 10-12). Discordant responses were distributed across all hospitals, demonstrating that no single hospital was responsible for the majority of discordant responses. The ability to identify hospitals that submitted forms with the most discordant responses allows the CNISP to identify training needs regarding data collection.

Several recommendations that were identified from the audit of the 2005 MRSA surveillance data have been implemented. A data quality framework with quality assurance practices, including ongoing auditing has been integrated into the Agency's surveillance programs. Annual in-service training and seeking input from data collectors regarding protocol development was initiated and is ongoing. The Agency continues its efforts to improve standardization and interpretation of surveillance protocols. Clearly defining variables and providing applicable response options may improve data quality, especially for those variables that require clinical judgement.

The CNPHI internet-based surveillance application is an innovative data entry and reporting tool with built-in logic for skips, elimination of duplicate reporting, and the ability to edit/update records. Although not yet evaluated, the implementation of web-based reporting at the Agency has likely played a pivotal role in improving the reliability of CNISP surveillance data. This is supported by the decrease in the proportion of total discordant responses from this VRE audit (4%) compared to the previous MRSA audit (7%) where CNPHI was not used for data entry. A further example of how CNPHI may have improved reliability is by incorporating program logic rules that detect inconsistencies and provide immediate feedback for correction of errors that occur when entering data.

The methodology we employed in this reliability audit has several limitations. Given the lack of follow-up and data verification, discrepancies

between the original and re-abstracted data to determine which of the discordant pairs was correct could not be resolved. Also, there was no evaluation of case ascertainment, which is an important limitation but beyond the scope of this reliability audit. We were not able to verify whether the same ICP collected both the original and re-abstracted data. However, given the delay of at least two years between the two collections, this did not likely affect the results of this audit. The final sample of re-abstracted cases forms represented 13% of all 2008 VRE cases submitted which is an improvement over our previous MRSA audit (9).

This audit of the reliability of the 2008 CNISP VRE surveillance data provided another opportunity to improve the quality of CNISP data. Several of the recommendations resulting from the previous MRSA audit were implemented; for example, online data entry using CNPHI. Following this audit, to further increase data quality across all CNISP surveillance projects a standardized and validated minimum dataset was implemented in 2013. The minimum dataset will ensure standardization of surveillance definitions, variables and response options in order to further improve the quality of CNISP surveillance data.

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REFERENCES

- Public Health Agency of Canada. *Vancomycin-resistant Enterococci infections in Canadian acute-care hospitals: Surveillance report January 1, 1999 to December 31, 2011*. Surveillance and Epidemiology Division, Centre for Communicable Diseases and Infection Control, 2012.
- Salgado CD, Farr BM. "Outcomes associated with vancomycin-resistant Enterococci: a meta-analysis." *Infect Control Hosp Epidemiol* 24, no. 9 (2003): 690-698.
- DiazGranados CA, Zimmer SM, Klein M, Jernigan JA. "Comparison of mortality associated with vancomycin-resistant and vancomycin-susceptible Enterococcal bloodstream infections: a meta-analysis." *Clin Infect Dis* 41 (2005): 327-333.
- Byers KE, Anglim AM, Anneski CJ, Farr BM. "Duration of colonization with vancomycin-resistant Enterococcus." *Infect Control Hosp Epidemiol* 23, no. 4 (2002): 207-211.
- Woeltje KF, McMullen KM, Butler AM, Goris AJ, Doherty JA. "Electronic surveillance for healthcare-associated central line-associated bloodstream infections outside the intensive care unit." *Infect Control Hosp Epidemiol* 32, no. 11 (2011): 1086-1090.
- Hebden JN. "Rationale for accuracy and consistency in applying standardized definitions for surveillance of health care-associated infections." *Am J Infect Control* 40 (2012): S29-S31.
- Willis CD, Jolley DJ, McNeil JJ, Cameron PA, Phillips LE. "Identifying and improving unreliable items in registries through data auditing." *Int J Qual Health Care* 23, no. 3 (2011): 317-323.
- Masia MD, Barchitta M, Liperi G, Cantu AP, Alliata F, Torregrossa V, et al. "Validation of intensive care unit-acquired infection surveillance in the Italian SPIN-UTI network." *J Hosp Infect* 76 (2010): 139-142.
- Forrester L, Chen Collet J, Mitchell R, Pelude L, Henderson E, Vayalunkal J, et al. "How reliable are national surveillance data? Findings from an audit of Canadian methicillin-resistant Staphylococcus aureus surveillance data." *Am J Infect Control*, 2012: 102-7.
- Gittelsohn A, Senning J. "Studies on the reliability of vital and health records: I. Comparison of death and hospital record diagnoses." *Am J Public Health* 69, no. 7 (1979): 680-689.
- Pasquale MD, Peitzman AB, The Pennsylvania Trauma Systems Foundation. "Preventability classification in mortality cases: a reliability study." *J Trauma* 67, no. 5 (2009): 1097-1102.
- Khue PM, Mallet A, Veziris N, Jarlier V, Robert J. "Evaluation of data quality in a laboratory-based surveillance of M. tuberculosis drug resistance and impact on the prevalence of resistance: France, 2004." *Epidemiol Infect* 136, no. 9 (2008): 1172-1178.
- Blake S, Cheatle E, Mack B. "Surveillance: Retrospective versus prospective." *Am J Infect Control* 8, no. 3 (1980): 75-78.
- Fontela PS, Rocher I, Piatt RW, Pai M, Buckeridge DL, Frenette C et al. "Evaluation of the reporting validity of central line-associated bloodstream infection data to a provincial surveillance program." *Infect Control Hosp Epidemiol* 34, no. 2 (2013): 217-219.
- Haley RW, Hooton TM, Schoenfelder JR, Crossley KB, Quade D, Stanley RC, et al. "Effect of an infection surveillance and control program on the accuracy of retrospective chart review." *Am J Epidemiol* 111, no. 5 (1980): 543-555.
- Mallin K, Palis BE, Watroba N, Stewart AK, Walczak D, Singer J, et al. "Completeness of American Cancer Registry Treatment data: implications for quality of care research." *J Am Coll Surg* In Press (2013): 1-10.
- Mayer J, Greene T, Ying J, Rubin MA, Trick WE, Samore MH. "Agreement in classifying bloodstream infections among multiple reviewers conducting surveillance." *Clin Infect Dis* 55 (2012): 364-370.
- Zirakzadeh A, Patel R. "Vancomycin-resistant Enterococci: colonization, infection, detection, and treatment." *Mayo Clin Proc* 81, no. 4 (2006): 529-536.
- Zuschneid I, Rucker G, Schoop R, Beyersmann J, Schumacher M, Geffers C, et al. "Representativeness of the surveillance data in the intensive care unit component of the German Nosocomial Infections Surveillance System." *Infect Control Hosp Epidemiol* 31, no. 9 (2010): 934-938. *

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Tackling VRE in a community hospital with teamwork and tenacity: Lessons learned

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ABSTRACT

A Vancomycin-resistant Enterococci (VRE) outbreak was declared November 2010 at Rouge Valley Health System, impacting two acute care and two complex continuing care units. A number of infection control measures were immediately put into action with an ongoing focus on environmental controls, adherence to hand hygiene and isolation protocols. Despite concerted efforts to resolve the VRE outbreak in a timely fashion, ongoing transmission of VRE continued with three distinct peaks identified throughout the 17-month period. A total of 110 patients became colonized with VRE. This article outlines steps taken to investigate and manage an outbreak of VRE colonization and lessons learned.

INTRODUCTION

Enterococci are bacteria that are commensals of the gastrointestinal tract of most individuals. They can be found on the skin, female genital tract, oropharynx or in the bile. Generally they are harmless (colonization). The Enterococci which are resistant to the antibiotic vancomycin are called vancomycin-resistant enterococci (VRE). VRE is found in the stool of colonized individuals. There is no treatment for VRE colonization. Sometimes VRE can cause infection of the blood stream or urinary tract which is difficult to treat (1). Intestinal colonization may persist for long periods of time. Individuals may continue to shed the bacteria for weeks to months (2). This adds significantly to morbidity and mortality rates of infected patients and associated clinical costs (3). VRE is spread by

either direct contact from one person to another through transiently colonized hands or by indirect contact by touching contaminated surfaces or equipment e.g. toilet, door handle, light switch, faucet, blood pressure cuff, stethoscope, call bell, bed rail etc. (4). VRE can survive in the environment for more than four months (5) and requires enhanced environmental disinfection.

Risk factors for VRE acquisition include (1):

- Hospitalization
- Immunocompromised patients (cancer, transplant, critically ill patients in ICU)
- Indwelling devices (e.g., urinary catheter, central venous catheter)
- Treatment with antibiotics such as vancomycin, penicillin, gentamicin (6,7,8,9)
- Surgery (intra-abdominal or chest surgery)

Background

The first two cases of VRE were reported Nov. 19, 2010, attributable to 9E and 9W (medical units). Point prevalence screening for VRE on 9E and 9W identified 3 additional cases. An outbreak caused by Vancomycin-resistant *Enterococcus faecium* was declared Nov. 29, 2010 and an outbreak management team was established. Management of the outbreak included the standard steps in outbreak investigation and management (10). Ten cases of rectal VRE colonization were identified in Nov 2010 with an additional 42 cases identified by January 2011 which was the first of three distinct peaks as noted in the epicurve (Fig. 1). Two index cases (had no direct contact with each other) were identified in each of the medical units on the same date. Testing contacts (roommates) of the index cases

identified that some of them had acquired VRE. One of these contacts was in the continuing care unit at the time of testing and transmission to his roommate had occurred. A total of 110 patients became colonized with VRE. The outbreak was declared over May 1, 2012.

Outbreak investigation

An Outbreak Management Committee was established with representation from infection control, medical directors, program directors, senior management, environmental services, unit managers, clinical practice leaders, security, communications, pharmacy, laboratory and admitting. Outbreak investigation included the following:

- **Case Definition:** Laboratory confirmed VRE in a patient from 9E and 9W (medical units), 3E and 3W (continuing care units) between Nov. 25, 2010 to May 1, 2012. This was based on admission screen negative for VRE.
- **Lab Investigations:** Culture and polymerase chain reaction (PCR) testing of rectal swab for VRE and pulsed-field gel electrophoresis (PFGE) for genetic typing.
- **Environmental Cultures**
- **Line Listing of Cases:** Patients positive for VRE

- **Demographic Data:** Patient name, age, sex, date of admission, location in hospital
- **Epicurve (Graphs)**

Infection Control Measures

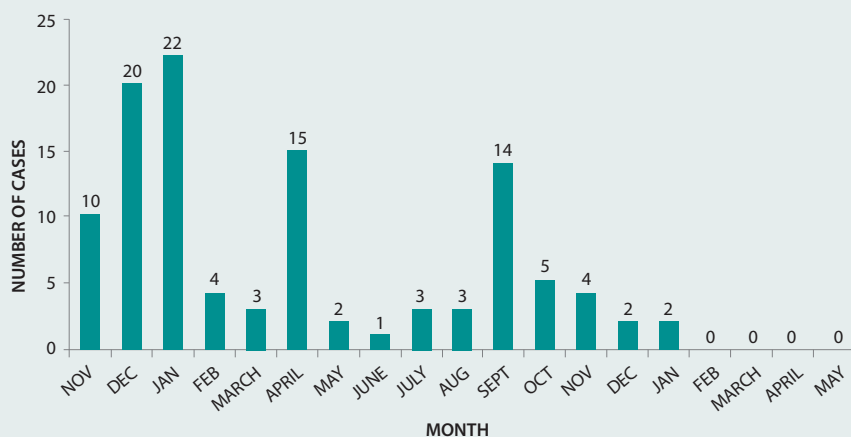
Infection Control Measures included the following:

- **Hand Hygiene:** Reinforcing hand hygiene for staff/patients/visitors (11).
- **Contact Precautions** for VRE positive patients (12) and for VRE contacts accommodated in single room; cohorted if feasible.
- **Discontinuation of Contact Precautions:** VRE contacts after 3 negative tests one week apart (3rd negative taken as an extra test during the outbreak); for VRE positive patients, minimum 3 successive negative cultures with at least one culture taken 3 months after the last positive culture (4).
- **Personal Protective Equipment (PPE):** Gown and gloves (12).
- **Dedicated Equipment** for patients on contact precautions.
- **Identification of Patients Colonized with VRE:** Active surveillance for VRE in the affected units by screening all admissions and transfers, weekly point prevalence screening (Fig 2) and screening contacts (i.e., roommates), computerized alert system for

patients colonized with VRE and VRE contacts.

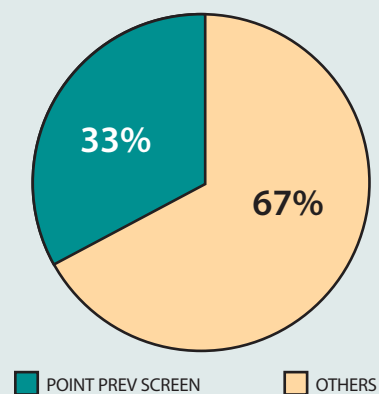
- **Patient Control Measures:** Patients restricted to their rooms however were permitted to ambulate and/or receive physiotherapy as needed based on compliance with infection control practices. Any transfers from the affected units were to be approved by infection control. Patient appointments for diagnostic tests continued with adherence to recommended infection control practices and timely communication of isolation status of the patient to the receiving department. Communal activities within the continuing care units were discontinued. Two percent (2%) chlorhexidine gluconate once daily bath (13) for all patients on the affected units commenced Feb. 5, 2011. VRE positive patients and VRE contacts were cohorted geographically (12).
- **Staff Control Measures:** Staff cohorting included nurses, clerical staff and housekeeping staff for each of the affected units with a focus on dedicated nurses assigned to the VRE positive patients (12) within a given shift. The above mentioned personnel were not to work on other units within the

FIGURE 1: VRE Colonization by Month



There were three peaks during the outbreak, Jan 2010, April 2011, and Sept 2011 reflecting the existence of VRE reservoirs as evidenced by positive environmental cultures. Transmission was confirmed by genetic relatedness between VRE isolates of patients and environmental cultures by PFGE.

FIGURE 2: VRE Identification



67% of VRE positive test results were identified from point prevalence screens. 33% of VRE positive test results were identified from transfer, contact tracing, or re-admission swabs.

same shift but were allowed to work in non-affected units for the entire shift if needed with advance scheduling. Staff on the affected units wore scrub suits supplied by the hospital's Central Processing Department. Allied health staff (occupational therapists and physiotherapists) were to schedule the VRE positive patients and VRE contacts to the end of their day.

- **Visitor Control Measures:** Visiting restrictions in place, with timeframe restricted to 5-9 p.m. and one visitor at a time. Exceptions were made on compassionate grounds. Visiting restriction signage was posted at entrances of the facility and on the affected units. Visitors to check in at the nursing station before visiting the patients and receive education on hand hygiene and PPE from a member of the nursing staff. A visitor logbook was maintained to ensure the above. Visitation by outside groups (e.g., recreation therapy) on the continuing care units was discontinued.
- **Cleaning and Disinfection:** Enhanced cleaning of common areas and high touch surfaces on the affected units, including hand rails in the hallways, nursing stations, door handles, TV rooms, VRE positive patient rooms, patient charts and medication carts and all shared equipment. Enhanced environmental cleaning was performed twice daily (14) with quaternary ammonium compounds (Didecyl dimethyl ammonium chloride 8.704% and Dimethyl benzyl ammonium chloride 8.190%) and bleach (bleach wipes) with 0.55% Sodium hypochlorite. Prior practice was to use a manually mixed bleach solution prepared by housekeeping staff. Project cleaning of all rooms on the affected units with the above two-step cleaning process (quaternary ammonium compounds and bleach) was implemented.
- **Environmental Audits:** Environmental audits were performed by supervisors of Environmental Services through visual inspections, environmental surface markers using

Glo Germ™ and surface adenosine triphosphate (ATP) bioluminescence. Infection Control Professionals supported the environmental services through visual inspections and by taking environmental swabs from VRE positive patient rooms that were terminally cleaned (randomly chosen rooms and specific rooms that had repeated transmissions). Multiple environmental surfaces were swabbed. In addition, checklists for daily and terminal cleaning were introduced.

- **Inventory:** Furniture and mattresses with impaired integrity and hard to clean surfaces were replaced as needed.
- **Storage Space:** Clean and dirty utility rooms were created on one of the medical units that lacked these dedicated spaces.
- **Education for Staff:** Ongoing education for staff regarding VRE, hand hygiene and PPE including weekends and after hours.
- **Hand Hygiene Audits:** Enhanced audits of hand hygiene on the affected units.
- **Unit Closures:** The affected units were closed to admissions and transfers were restricted temporarily. A temporary unit was opened to accommodate patients from the Emergency department (ED) and to decant patients from the VRE outbreak units to allow for terminal and project cleaning.

Communication

Communication was pivotal in managing the outbreak. Regular outbreak updates were sent to key stakeholders.

Senior Management Team briefings were held regularly. Patient families and staff were kept informed of the status of the outbreak. Appropriate visitor restriction signage was put in place. There was ongoing consultation with the local Public Health Unit. Application of Lean principles was implemented with visual management boards in the nursing stations on affected units identifying patients on isolation, type of isolation, reason for isolation, swab status, swab schedule, etc.

Evaluation

A Cause and Effect review (using the fish-bone tool) was conducted within the first two months of the outbreak, which identified potential infection control breaches and opportunities to strengthen and reinforce infection control measures including: Lack of dedicated equipment, lack of adherence to disinfection of equipment between patient use, impaired furniture and equipment, gaps in communication between staff within and between shifts, lack of adherence to infection control practices (routine practices, contact precautions) by all staff including physicians and visitors and cluttered hallways.

Discussion

This was the first VRE outbreak in our facility. The first two cases of VRE were reported on November 19, 2010 in the medical units. Point prevalence screening identified three additional cases. Swabbing a roommate (contact) who had been transferred to one of the continuing care units (3E) identified the contact as positive for VRE. Further testing confirmed this positive contact's roommate on 3E to be VRE positive as well (Fig 3). A VRE outbreak was declared on November 29, 2010 with the following case definition: Laboratory confirmed VRE in a patient from 9E and 9W (medical units), 3E and 3W (continuing care units) between November 25, 2010 to May 1, 2012. This was based on admission screen negative for VRE. Point prevalence screening on the continuing care units identified new cases of VRE. One of the index cases who was on 9E for 35 days, was VRE negative on admission screen to 9E, identified VRE positive in a rehabilitation facility to where the patient was discharged. The other index case identified VRE positive on 9W, was in hospital on different medical units for 15 days (ICU, 9E and 9W). Tracing of VRE swab status of this patient indicates a likelihood of VRE acquisition during his stay on 9E. A line listing of VRE positive cases was maintained. Weekly point prevalence screening for VRE on the affected units was conducted starting November 25, 2010 to April

2012. Testing for VRE included a rectal swab culture. PCR testing for VRE was implemented from February 2, 2011 for quicker turn around time of results.

Data were extracted from chart reviews including patients' clinical history and location history within the hospital. Patient data were reviewed to establish temporal and geographic overlap. Environmental swabs were collected with extensive sampling of high touch surfaces such as bed rails, call bells, telephones, computer keyboards in patient rooms and in the common areas of the affected units.

Three peaks were noted during the 17-month period (Fig 1). The VRE isolates were tested by PFGE to determine relatedness. Beginning November 2010, the first peak was noted in January 2011, the cluster of isolates revealing to be type A, the second peak in April 2011 had a cluster of type A1 and the third peak followed in September 2011 with a cluster of type A14. This indicates clonal spread of organisms. Resurgence of the outbreak in April 2011 from what appeared to have been controlled strongly supports the long-term survival of VRE in the

environment from our experience (Fig 4). Patients' ages ranged from 28 years to 96 years (mean, 76 years; median, 80 years); 45% were males, 55% were females; the time from admission to acquisition of VRE ranged from 2 days to 183 days (mean, 25 days; median 17 days). The following common factors for VRE colonization were noted: elderly, long stay in hospital, indwelling devices (e.g., Foley catheters, PEG tubes), immunocompromised (diabetes/cancer) and antibiotic therapy.

Genetic typing of isolates (by PFGE) helped identification of possible modes of transmission (Fig 5). Genetic data can link patients directly to the environmental cultures as evidenced by isolates taken from the following surfaces on the 9W medical unit: mattress, computer keyboard; and from the 9E medical unit: over bed table. The environmental isolates were found to be identical to the circulating outbreak strain and were identified on these medical units during the peaks of April 2011 and September 2011. The finding of VRE on environmental surfaces that had undergone cleaning suggests that VRE is a hardy organism

and emphasizes the need for verification of cleaning. These findings also highlight the need for removal of items with difficult to clean surfaces.

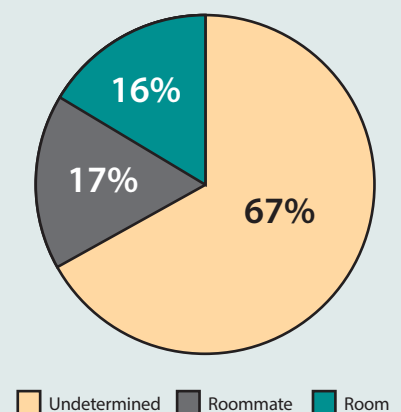
A total of 110 cases of VRE were identified. The organism identified in 102 isolates by rectal swab cultures was Vancomycin- resistant *Enterococcus faecium*. Van A gene with Van A phenotype was the most common molecular configuration. Two isolates showed incongruence as Van B by polymerase chain reaction (PCR) with Van A phenotype. The remaining 8 isolates were identified as Van A gene positive by PCR with vancomycin sensitive *Enterococcus faecium* (VSE) on culture. Three large clusters were noted based on genetic typing of VRE isolates by PFGE namely Type A (November 2010 to January 2011); Type A1 (January 2011 to July 2011); Type A14 (July 2011 to October 2011) indicative of clonal spread. Other subtypes such as A2, A4, A8, etc. were noted sporadically. There were 162 environmental swabs taken; three of which tested positive for Vancomycin- resistant *Enterococcus faecium*. Swab sticks moistened with sterile normal saline

FIGURE 3: VRE Colonization by Unit



The most affected unit, 9E, did have issues with availability of a separate space for dirty utility. 9W did have reservoirs as evidenced by positive environmental cultures from a mattress and computer keyboard. Patient transfers contributed to the spread of VRE to different units.

FIGURE 4: VRE Acquisition



67% of VRE acquisitions were of undetermined origin.

17% of VRE acquisitions were likely transmissions from VRE positive roommates.

16% of VRE acquisitions were likely from patients occupying rooms that were previously occupied by VRE positive patients.

were used to collect environmental swabs. A single swab stick was used for each site. Swabs were collected from commodes, mattresses and high touch surfaces such as bed rails, call bells, telephones, computer keyboards, etc. in patient rooms and in common areas of the affected units e.g. nurses' station, common washrooms, staff lounges. The swabs were transported in Amies clear medium (Starplex Scientific Starswab II Collection and Transport Systems); a general purpose transport medium.

Challenges

- Closure of units affected patient flow from the Emergency Department (ED).
- Extra laboratory resources for VRE screening (admission, transfer, point prevalence).
- Extra staffing (nursing and environmental services) to accommodate workload of increased number of patients on contact precautions.
- Additional expenditure in opening a temporary unit to accommodate patients from ED during closure of medical units.
- Extra resources – PPE.

Source

Possible sources are:

- (1) The index case on 9E. This patient's admission culture was negative for VRE however low VRE density in the rectal sample or improper sample collection might have missed identification of VRE on admission.
- (2) Staff member who is a silent carrier.
- (3) Transmission from a patient who is an asymptomatic carrier who could have been colonized below detection level.

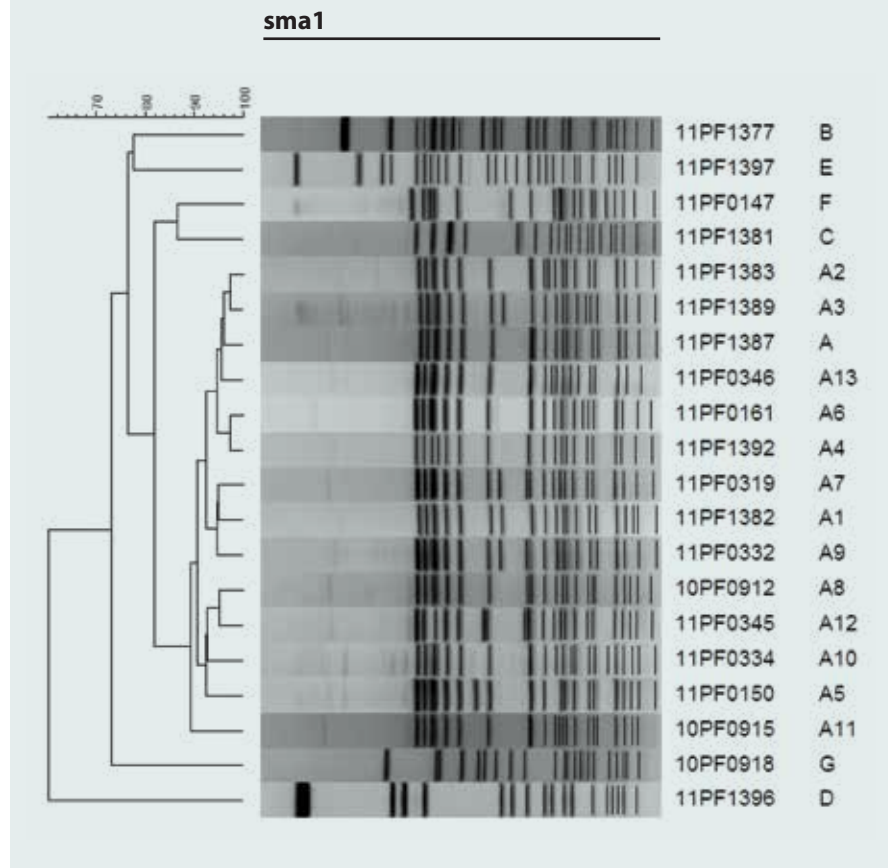
Inference of likely routes of transmission

Based on genetic data and epidemiological data the most likely routes of transmission are:

- Transmission from contaminated hands.
- Contaminated equipment such as BP cuffs, stethoscopes, pulse oximeters, glucometers, commodes.

FIGURE 5: PFGE Analysis of VRE Isolates 2010-2011

Dice (Opt: 1.50%) (Tol 1.5%-1.5%) (H>0.0% S>0.0%) [0.0%-100.0%]
sma1



- Environmental reservoirs such as furniture with porous surfaces including wooden or upholstered furniture, chairs with fabric, mattresses and furniture with impaired integrity could have been reservoirs for VRE bacteria as evidenced by VRE positive environmental cultures.

Outbreak was declared over on May 1, 2012. A thank-you message for all staff of ninth and third levels, housekeeping services and other pertinent personnel for their valued work and support was sent.

Debriefing session was held with all pertinent personnel on how the outbreak was handled and lessons learned.

Lessons learned

- Lack of adherence to routine practices (standard precautions) possibly contributed to spread of VRE.

- Allow adequate time for cleaning rooms without rushing new admissions to the allocated room.
- Clear identification of clean from unclean equipment.
- Keep hallways clutter free (Fig 6).
- Replace damaged equipment/furniture.
- Dedicated equipment for patients on additional precautions.
- Designated clean and dirty utility room.
- Adherence to standardized dilution requirements for mixing a bleach solution.

Recommendations

- Universal screening for antibiotic resistant organisms (AROs) for all patients being admitted to Medicine/Surgery.
- Lab confirmation of ARO status prior to transfer of patients from outbreak units.

FIGURE 6: Hallways were clutter free with the use of wall-mounted PPE organizers.



- Adopt rapid testing methods for identification of antibiotic resistant organisms like MRSA/ VRE/ESBL.
- Adhere to routine practices (standard precautions) and additional precautions.
- Disinfect shared equipment between patient use (12).
- Proper identification and storage of clean versus dirty equipment.
- Organized barrier supplies as in a wall mounted PPE organizer with dual advantage of accessibility and keeping hallways clear (Fig 4).
- Hand hygiene compliance for patients, staff and visitors.

- Consider ready to use disposable wash cloths (antiseptic skin cleanser) containing 2% Chlorhexidene Gluconate.
- Antibiotic stewardship program (4, 15).
- Education: Refresher sessions on infection prevention and control (IPAC), one-on-one education relevant in time and context.
- Application of Lean principles to outbreak management.
- Ongoing daily communication at change of shift and on patient transfer.
- Maintain staff morale and team cohesiveness.

- Ethical considerations with a balanced approach to ensure quality patient care while adhering to principles of Infection control (16).
- Adhere to visiting policy.
- Visitor education video with focus on Hand hygiene and PPE in multiple languages.
- Adequate environmental cleaning (time/product used/ items to be discarded or changed).
- Adopt products with non-porous surfaces for use in the healthcare environment (17).
- Consider the use of advanced technology for room disinfection e.g., disinfectant fogging machine that generates vapourized hydrogen peroxide (dry mist fog), kills a multitude of organisms including MRSA, VRE, *C difficile* spores, is user friendly and not labour intensive (18,19).

Conclusion

Shared equipment and shared assignments for staff appears to have spread the organism to different units reflecting indirect spread of VRE. Patient transfers from acute to continuing care contributed to the spread. Deeper scrutiny of the outbreak revealed the need to enhance processes to achieve good infection prevention control practices.

The experience of the VRE outbreak emphasizes the need for constant watchfulness of the healthcare environment in terms of maintaining inventory of equipment and furniture in good condition, ongoing education for staff, promotion of hand hygiene and PPE education for staff and visitors, active surveillance for AROs and maintaining routine practices (standard precautions). Concurrent support from the hand hygiene program certainly increased the awareness of importance of clean hands in preventing the spread of microorganisms. It is very important to maintain the morale of staff, maintain transparency of the situation and have an ethical approach to patients on contact precautions to provide quality patient care.

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REFERENCES

1. CDC. Vancomycin-resistant Enterococci in Healthcare Settings. <http://www.cdc.gov/hai/organisms/vre/vre.html>

- Baden, L. R., Thiemke, W., Skolnik, A., et al. Prolonged colonization with Vancomycin-Resistant Enterococcus faecium in Long term Care Patients and the Significance of "Clearance". *Clinical Infect Dis* (2001), 33(10): 1654-1660. Doi: 1086/323762.
- Niedermaier MS. Impact of antibiotic resistance on clinical outcomes and the cost of care. *Crit Care Med* 2001; 29(4 Suppl): N114-20. 51 Suppl 3:iii13-21.
- Provincial Infectious Diseases Advisory Committee (PIDAC). Annex A: Screening, Testing and Surveillance for Antibiotic-Resistant Organisms (AROs) In All Health Care Settings. Ontario: Feb 2012.
- Constanze W, Bettina W, Ekkehart D, Henning R. Survival of Vancomycin-Resistant and Vancomycin-Susceptible Enterococci on Dry Surfaces. *J Clin Microbiol* 1998; December, 36(12), 3734-3736.
- Louis B, Rice. Emergence of Vancomycin-Resistant Enterococci. *Emerging Infectious Disease* 2001; 7(2):183-187.
- Quale J, Landman D, Saurina G, Atwood E, DiToro V, Patel K. Manipulation of a hospital antimicrobial formulary to control an outbreak of vancomycin-resistant enterococci. *Clin Infect Dis* 1996;23(5):1020-5.
- Moreno F, Grota P, Crisp C, et al. Clinical and molecular epidemiology of vancomycin-resistant Enterococcus faecium during its emergence in a city in southern Texas. *Clin Infect Dis* 1995; 21 (5): 1234-7
- Donskey C J, Schreiber J R, Jacobs M R, Shekar R, Salata R A, Gordon S, et al. A polyclonal outbreak of predominantly Van B vancomycin-resistant enterococci in northeast Ohio. Northeast Ohio Vancomycin-Resistant Enterococcus Surveillance Program. *Clin Infect Dis* 1999; 29(3):573-9.
- Arjun S and William R J. Outbreak Investigations. In: *The Society for Healthcare Epidemiology of America, Practical Healthcare Epidemiology, 3rd Edition*: University of Chicago Press, 2010:143-155
- Provincial Infectious Diseases Advisory Committee (PIDAC). Best Practices for Hand Hygiene In All Health Care Settings. Ontario, Dec 2010.
- Provincial Infectious Diseases Advisory Committee (PIDAC). Routine Practices and Additional Precautions in All Health Care Settings. Ontario, Nov 2012
- Vernin M O, Hayden M K, Trick W E, Hayes R A, Blom W, Weinstein R A. Chlorhexidine gluconate to cleanse patients in a medical intensive care unit: the effectiveness of source control to reduce the bioburden of vancomycin-resistant enterococci. *Arch Intern Med* 2006; 166(3):306-12.
- Falk P S, Winnike J, Woodmansee C, Desai M, Mayhall C G. Outbreak of vancomycin-resistant enterococci in a burn unit. *Infect Control Hosp Epidemiol* 2000; 21(9):575-82.
- Recommendations of the Hospital Infection Control Practices Advisory Committee (HICPAC). Recommendations for preventing the spread of Vancomycin resistance. *Am J Infect Control* 1995;23:87-94
- Doxtator L, Zoutman D. An infection control perspective on patient advocacy. *Can J Infect Control* 2006; 21(3):129-132.
- Provincial Infectious Diseases Advisory Committee (PIDAC). Best Practices for Environmental Cleaning for Infection Prevention and Control in All Health Care Settings, Ontario, May 2012.
- Otter J A, Cummins M, Ahmad F, Van Tonder C, Drabu Y J. Assessing the biological efficacy and rate of recontamination following hydrogen peroxide vapour decontamination. *J Hosp Infect* 2007; 67(2):182-8.
- Jonathan A O, Gary L. French. Survival of Nosocomial Bacteria and Spores on Surfaces and Inactivation by Hydrogen Peroxide Vapor. *J Clin Microbiol* 2009; 47(1); 205-207. *

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Published Peer Reviewed Outcome Studies:

1. Levin J, et al., **Cooley Dickinson** in *AJIC* 2013, 41:746-748.
2. Simmons S, et al., **Cone Health System** in *JIP* 2013.
3. Stibich M, et al., **M.D. Anderson Cancer Center** in *ICHE* 2011, 32:286-288.
4. Haas J, et al., **Westchester** in *AJIC* 2014, 42:586-90.



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Factors influencing tattooing and body piercing behaviours: a cross-sectional survey of youth and adults in Wellington-Dufferin-Guelph aged 16-35 years

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ABSTRACT

Objectives

The objectives of this study were to assess the prevalence of body art (tattoos, piercings and extreme body modifications (EBM)) among youth and adults aged 16-35 years, residing in the counties of Wellington and Dufferin and the City of Guelph in southwestern Ontario. Factors influencing why, when and where individuals choose to receive body art were examined. Results will inform future harm reduction strategies and educational efforts.

METHOD(S)

An online survey that included questions on existing and future body art, motivators and risk perception was promoted via print and online media to recruit youth and adults within the relevant catchment area. Responses from individuals with and without tattoos and/or piercings were analyzed and compared using STATA version 12.0.

RESULTS

39% of respondents had both tattoos and piercings, and 26% had no tattoos or piercings. Age at first tattoo or piercing ranged from under age 10 upwards. Friend and family endorsement of a shop or artist was the primary influence when deciding where to go, and also influenced why body art was received. 15% of all respondents reported an existing EBM and 18% expressed an interest in obtaining an EBM in the future.

CONCLUSION

Education around body art should occur early on, preferably before the age when

body art is first contemplated. Harm reduction strategies should consider the impact of peer endorsement in influencing the type of body art received and the shop/artist visited.

KEY WORDS:

Tattooing; Body Piercing;
Body Modification, Non-Therapeutic

INTRODUCTION

While many studies have been conducted internationally and nationally regarding youth and adult attitudes towards body art and perception of the risks surrounding these services, no comparable studies have been conducted locally in south-western Ontario. Existing studies have examined the prevalence of tattoos and piercings, including motivating factors and subsequent infections, and not 'extreme body modification' (EBM) (1-6). EBM includes invasive services beyond traditional tattooing and body piercing, such as scarification, branding and ear lobe stretching (7). Body art (body piercing, tattooing and EBM) has become more prevalent in recent years; however, the risks (specifically bloodborne infections) associated with these services are still of concern, particularly if appropriate infection control practices are not followed by the tattoo or body piercing artist (1, 3-7). Understanding the influences surrounding body art will help public health units to increase public knowledge and reduce the risks of infection associated with these services, as per the *Infection Prevention and Control in Personal Services Settings Protocol (2008)* (8). This protocol, published by the Ontario Ministry of Health and Long-Term Care under the authority of the

TABLE 1: Demographic and behavioural characteristics of tattoo and body piercing survey respondents

	% (No.)	Has tattoo(s) only % (No.)	Has piercing(s) only % (No.)	Has tattoo(s) & piercing(s) % (No.)	No tattoo(s) or piercing(s) % (No.)
Gender (n=1,265)*					
Male	17.2% (218)	26.2% (57)	10.1% (22)	25.2% (55)	38.5% (84)
Female	81.7% (1,034)	5.4% (56)	29.5% (305)	42.3% (437)	22.8% (236)
Transgendered/other	1.0% (13)	0.0% (0)	30.8% (4)	38.5% (5)	30.8% (4)
	100.0%				
Age-group (n=1,270)					
20 years and under	35.8% (455)	5.3% (24)	35.8% (163)	22.9% (104)	36.0% (164)
21-25 years	36.1% (458)	11.4% (52)	23.1% (106)	43.0% (197)	22.5% (103)
26-30 years	18.1% (230)	10.0% (23)	19.6% (45)	53.9% (124)	16.5% (38)
31-35 years	10.0% (127)	11.0% (14)	14.2% (18)	58.3% (74)	16.5% (21)
	100.0%				
Highest education completed (n=1,181)					
Some or all high school/other	22.9% (271)	5.9% (16)	24.3% (66)	40.6% (110)	29.2% (79)
Some post-secondary	40.2% (475)	7.8% (37)	28.8% (137)	34.1% (162)	29.3% (139)
Post-secondary diploma/undergraduate degree	29.0% (342)	13.7% (47)	21.6% (74)	45.6% (156)	19.0% (65)
Graduate degree (Master/PhD)	7.9% (93)	6.4% (6)	30.1% (28)	32.3% (30)	31.2% (29)
	100.0%				
Tobacco usage (lit/chew) (n=1,171)†					
None	72.9% (854)	9.1% (78)	27.4% (234)	30.7% (262)	32.8% (280)
Previous	7.9% (92)	10.9% (10)	26.1% (24)	54.4% (50)	8.7% (8)
Occasional	11.4% (134)	9.0% (12)	21.6% (29)	54.5% (73)	14.9% (20)
Daily	7.8% (91)	5.5% (5)	15.4% (14)	73.6% (67)	5.5% (5)
	100.0%				
Alcohol consumption (n=1,177)†					
None	10.5% (124)	5.7% (7)	17.7% (22)	22.6% (28)	54.0% (67)
Previous	3.7% (44)	9.1% (4)	22.7% (10)	47.7% (21)	20.5% (9)
Occasional	60.0% (706)	9.4% (66)	25.5% (180)	39.8% (281)	25.4% (179)
Regular (1 or more times per week)	25.7% (303)	9.6% (29)	30.0% (91)	41.9% (127)	18.5% (56)
	100.0%				
Recreational drug use (including marijuana) (n=1,165)†					
None	60.0% (699)	8.9% (62)	24.5% (171)	31.0% (217)	35.6% (249)
Previous	15.5% (181)	7.2% (13)	27.1% (49)	50.3% (91)	15.5% (28)
Occasional	17.0% (198)	9.1% (18)	30.8% (61)	48.0% (95)	12.1% (24)
Regular (1 or more times/wk)	7.5% (87)	11.5% (10)	24.1% (21)	50.6% (44)	13.8% (12)
	100.0%				

*Gender: transgendered/other dropped from analyses due to low cell counts

† Dropped responses 'prefer not to answer' for tobacco use (n=5), alcohol consumption (n=8) and drug use (n=20) due to low cell counts

Health Protection and Promotion Act (9), requires Public Health Units to inspect all personal service settings annually, including premises offering body art services to the public, to ensure that minimum infection control measures are being followed (10).

Wellington-Dufferin-Guelph Public Health (WDGPH) receives complaints each year from individuals with concerns regarding infection control practices, post-body art infections and poor tattooing artwork, particularly from body art received at uninspected premises. Further, due to increased public demand, there has been interest from several local body art shops in offering EBM services to the public.

Understanding why, when and where individuals go to receive body art as well as public perception of the potential risks involved in receiving these services will assist in the creation of harm reduction resources. These resources will promote awareness of the risks associated with receiving body art and support positive change in body art behaviours.

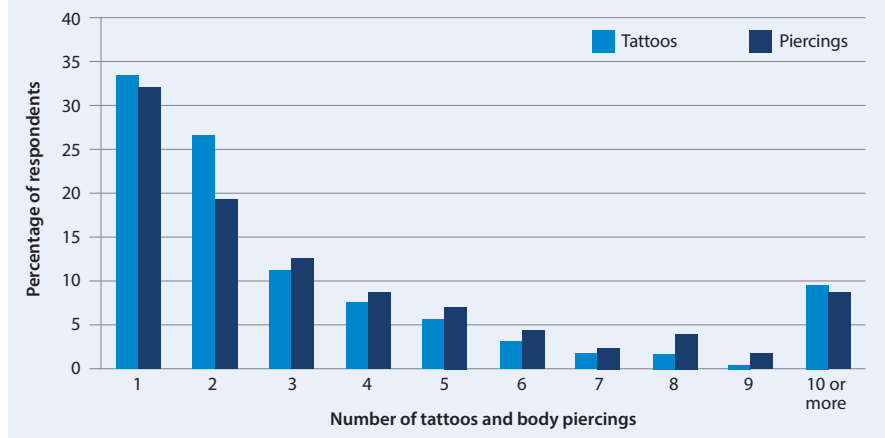
METHODS

A cross-sectional survey was conducted, targeting youth and adults aged 16 to 35 years, residing in the counties of Wellington and Dufferin or the City of Guelph (WDG).

Similar to the rationale of Greif et al. (1999), ear lobe piercings were excluded for both males and females (3,5).

An ideal sample size of 384 was calculated (using 80% power, 50% population prevalence of tattooing and/or body piercing and 95% confidence) using the National Statistical Service (Australia) online sample size calculator (11). Ethics approval was received from WDGPH to survey the general public and from the University of Guelph

FIGURE 1: Self-reported number of tattoos and/or body piercings among 593 individuals with tattoos and 729 with body piercings



Research Ethics Board (REB#13JN025) to recruit and survey on campus.

Business cards and posters were used to promote the survey via distribution to community partners and locations, including local body art shops and libraries, the AIDS Committee of Guelph & Wellington County (ACGWC) and the University of Guelph. Survey promotion also occurred online via Public Health and partner websites and social media. Most data collection occurred via convenience sampling and voluntary online completion by participants, with some in-person data collection using iPads at the university, a local shelter and treatment centres in order to ensure inclusion of high risk population sub-groups. All participants were directed to an online anonymous survey (created using FluidSurveys), the first page of which outlined relevant study information and asked participants interested in continuing with the survey to provide consent to the collection and use of their information. Consenting participants were asked a series of questions regarding demographics, current and future body art, and

behaviours such as recreational drug, alcohol and tobacco use, which have previously been identified as factors associated with receiving body art (1,2,5).

All data was analyzed using STATA version 12.0 (College Station, Texas) (12). Responses from those aged under 16 years or older than 35 years at the time of survey completion were dropped from the dataset, as were those with age missing (13). Data from those residing outside of WDG were retained as students might have reported their permanent home address instead of their temporary address while attending a local post-secondary institution. Age and education were each collapsed into four categories and the number of self-reported tattoos and body piercings were each collapsed into two categories (less than 5, 5 or more). The category "gender: transgendered/other" was dropped from analyses due to low cell counts. Separate Pearson χ^2 tests were used to assess the association between tattooing and piercing and variables such as gender, age, education, number of tattoos and piercings and substance use. Statistical significance was defined as $p < 0.05$.

"Consenting participants were asked a series of questions regarding demographics, current and future body art, and behaviours such as recreational drug, alcohol and tobacco use, which have previously been identified as factors associated with receiving body art."

TABLE 2: Self-reported body art prevalence, influences and risk perception

Tattoos & body piercings (n=1,270)	% (No.)
1 or more tattoos, no piercing	8.9 (113)
1 or more piercings, no tattoos	26.1 (332)
1 or more tattoos & 1 or more body piercings	39.3 (499)
No tattoos or body piercings	25.7 (326)
	100.0

Factors influencing decision to get a tattoo‡ (n=597)	% (No.)
Personal reason (e.g. to honour a deceased friend/family member)	72.5 (433)
I like the way it looks	71.4 (426)
To express myself as an individual	63.3 (378)
My friends have tattoos	22.6 (135)
My parent/other family member has tattoos	18.8 (112)
Current popular trends (e.g. television/magazine)	12.4 (74)
	--

Factors influencing decision to get a body piercing‡ (n=762)	% (No.)
I like the way it looks	88.5 (674)
To express myself as an individual	48.0 (366)
Personal reason	44.5 (339)
My friends have piercings	35.8 (273)
Current popular trends (e.g. television/magazine)	28.9 (220)
	--

Reasons for not ever having/wanting a tattoo in the future‡ (n=139)	% (No.)
I may not like the same image/design in the future	77.0 (107)
I don't like the way they look	54.7 (76)
It may affect my ability to get a job	46.0 (64)
My parents/partner do not approve of tattoos	38.1 (53)
I am worried that I may get an infection/scar	35.3 (49)
I am afraid of needles	25.9 (36)
Other reason(s) (e.g. price, fear, disinterest, permanence etc)	24.5 (34)
	--

Reasons for not ever having/wanting a body piercing in the future ‡ (n=137)	% (No.)
I don't like the way they look	59.1 (81)
I don't want to have a hole if I remove the jewellery in the future	51.8 (71)
I am worried that I may get an infection or scar	49.6 (86)
It may affect my ability to get a job	30.7 (42)
My parents/partner do not approve of body piercings	26.3 (36)
I know someone who had a bad experience with a body piercing	22.6 (31)
Other reason(s) (e.g. disinterest, price, deemed unnecessary)	21.2 (29)
I am afraid of needles	19.7 (27)
	--

TABLE 2: Self-reported body art prevalence, influences and risk perception (continued)

Perception of risks associated with tattooing/piercing‡ (n=1,048)	% (No.)
Skin infections	80.2 (840)
HIV	74.1 (777)
Scarring	74.0 (776)
Hepatitis C	71.9 (754)
Bloodborne infections	70.9 (743)
Hepatitis B	67.5 (707)
Bleeding	66.9 (701)
Allergic reactions	66.5 (697)
I don't know	4.6 (48)
I don't think there is any risk	1.5 (16)
	--
‡categories not mutually exclusive	

RESULTS

A total of 1,476 responses were received. After dropping ineligible responses and those who declined to answer the first (mandatory) question regarding whether the individual had a tattoo and/or body piercing), the final dataset consisted of 1,270 responses, representing a completion rate of 92.6%. The majority (82%) of respondents were female, and 72% of respondents were aged 25 years and under (Table 1). Most (77%) respondents had completed at least some post-secondary education. 39% of all respondents reported having both tattoos and piercings, with 26% reporting no tattoos or piercings (Table 2). The prevalence of tattoos among respondents was 48% and of body piercings was 65% (Figure 1).

Age at first tattoo/body piercing:

Self-reported age at which a tattoo was first received varied from age 11-12 upwards, with most (72%) respondents indicating they were over 18 years when first tattooed. Of those first tattooed under age 16, only 57% of 42 respondents reported that the shop had asked for parental consent. In contrast, age at first piercing ranged from under 10 years to 18 or older, with 73% of 762 respondents indicating they received their first body piercing at age 17 or younger. Of those first pierced under age 16, 69% of 284 respondents indicated that their parent or guardian was asked to provide consent.

Tattoos and piercings:

Age was significantly associated with having tattoos/piercings ($p < 0.001$, Table 2), with respondents being more likely to report having both tattoos and body piercings with increasing age; 36% of 455 respondents aged 20 years and under reported no tattoos or piercings and 23% reported having both, compared with only 17% of 127 respondents aged 31-35 years who reported having no tattoos or piercings and 58% who reported having both. Gender was significantly associated with body art, with females being more likely than males to report having body piercings only or body piercings and tattoos ($p < 0.001$). There was no significant difference between gender and the number of body piercings received ($p = 0.42$), however males were significantly more likely than females to have 5 or more tattoos ($p = 0.002$).

Ear cartilage, nose, navel and microdermal piercings were the most common piercings reported, with cheek and genital piercings being the least common. Although 91% of 744 respondents with a body piercing reported that 1 or more piercings were performed using a piercing needle, several other methods were reported (26% piercing gun, 6% sewing needle, 4% safety pin, 8% other; self-piercing kit, jewellery, thumb tack or similar) and 11% of respondents reported that they had pierced themselves. Tattoos

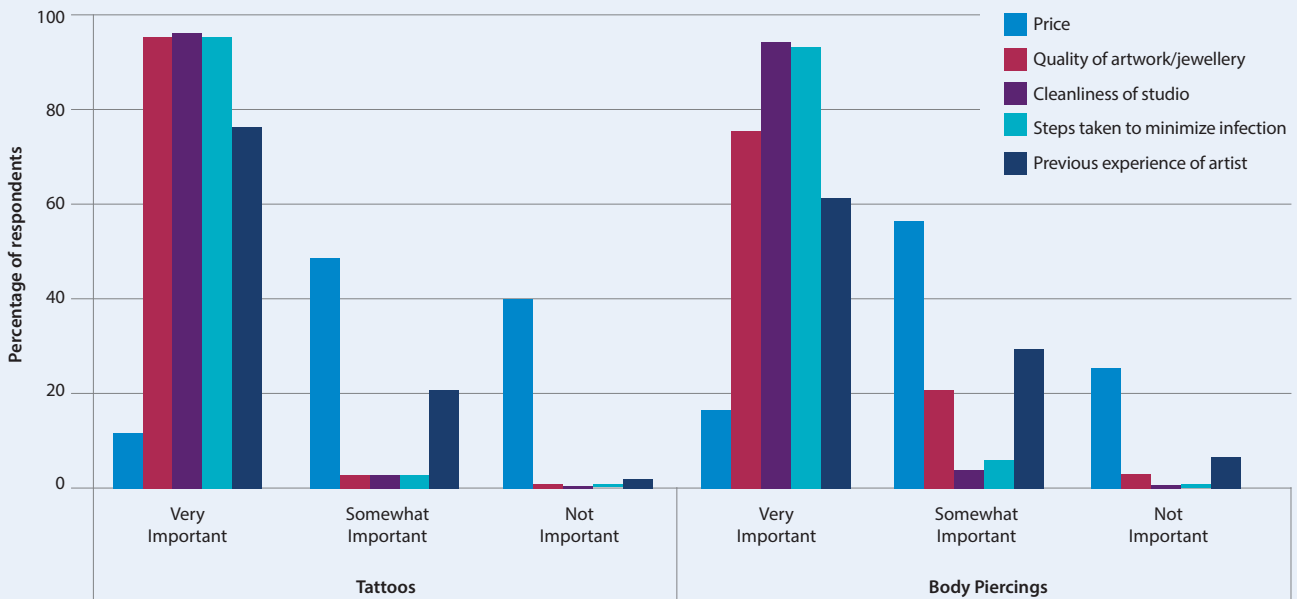
on the torso (including ribs and hips), arms, legs and shoulders were the most commonly reported, with the face, neck and hands being the least likely to be tattooed. 83% of 586 respondents with a tattoo wanted to get another tattoo in the future, and 49% of 746 respondents with a piercing wanted to get another piercing.

Of the 26% of respondents with no existing tattoos or piercings at the time of survey completion, 57% indicated they wanted to receive body art in the future, with 92% of these 185 respondents wanting a tattoo, and 49% (of 182 respondents) wanting a body piercing.

Post-body art complications and regrets:

Sixty-three percent of 749 respondents with a piercing reported a subsequent adverse reaction, beyond what the individual considered normal healing after getting a body piercing, compared to 28% of those 597 respondents who had received a tattoo (Figure 3). Individuals experiencing an adverse reaction following a piercing were also more likely to consult a medical professional than those with an adverse reaction following a tattoo (15% of 468 respondents versus 6% of 160 respondents). Six percent of 596 individuals with a tattoo and 6% of 748 individuals with a body piercing

FIGURE 2: Self-reported factors influencing where respondents went to receive tattoos (n=573) and body piercings (n=725)



reported subsequent regret, with commonly reported reasons for tattoo regrets being artwork quality (48% of 90 respondents), no longer liking the same image or design (41%) or no longer liking the location of the tattoo (41%). In contrast, regrets associated with body piercing were primarily due to infections sustained following piercing (35% of 78 respondents), other reasons (19%; e.g. jewellery migration, piercings received too young or subsequent discomfort and/or pain) or piercings leaving behind a visible mark or hole on the body (18% and 17% respectively). Eight percent of 596 respondents with a tattoo reported receiving a tattoo while under the influence of drugs and/or alcohol, compared to 6% of 746 respondents with a piercing. Drug, alcohol and tobacco use were significantly and positively associated with having tattoos and/or piercings ($p < 0.001$).

Infection control and sources of information:

Studio cleanliness and steps taken by the artist to minimize infection were very important to most respondents, irrespective of whether the respondent had tattoos and/or piercings (Figure 2). Interestingly however, previous experience of the piercing artist and jewellery quality

were ranked less important than tattoo artist experience and tattoo artwork quality, even though piercings are more invasive and more commonly reported to result in infection or other complications.

The main sources of information used by respondents prior to getting a tattoo were speaking to family and friends (78% of 580 respondents), online information (64%) and contacting various shops/artists (34%). Similarly for body piercing, main sources of information were speaking to friends and family (72% of 740 respondents), online information (50%) and contacting various shops/artists (20%).

When asked how they had found the premises where they got their tattoo(s) and/or piercing(s), over 70% of respondents reported that the shop or artist had been recommended by a friend or family member. Respondents with body piercings were more likely to find a shop/artist by walk-in (50% versus 29% for tattoos), and were less likely to visit multiple shops when deciding where to go (17% versus 36% for tattoos).

When asked how respondents would ideally like to access health information related to body art, the most popular source of information was a website (82%) or fact sheet (54%), with an overwhelming 98% of 1,048 respondents indicating that if public

health made inspection reports for premises offering body art services to the public available online, this would or might influence the decision where to go to get body art.

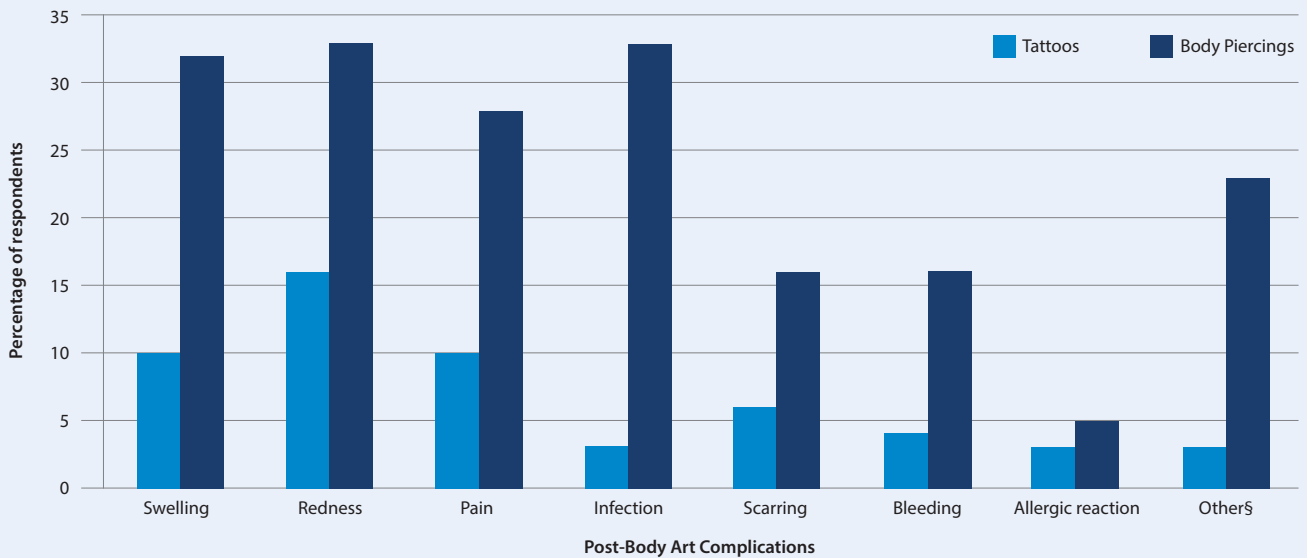
Extreme Body Modification:

Although EBM is a more recent phenomenon, many respondents were aware of existing EBM services such as ear lobe stretching (92% of 1,185), tongue splitting (87%), branding (71%) and ear pointing (66%), although few respondents (15% of 1,107) currently had an existing EBM (13% reported having stretched ear lobes, 2% had undergone scarification and 3% had previously undergone branding, ear pointing or tongue splitting). 18% of 1,119 respondents indicated that they had thought about getting an EBM in the future, with the most popular modifications being ear lobe stretching (10%), scarification (5%), branding (4%) and temporary piercings (e.g. Corset piercings, 4%).

DISCUSSION

The 16-35 year age group was surveyed as they were the most likely to want/have body art, and the most likely to visit an uninspected establishment,

FIGURE 3: Self-reported body art complications (beyond what the respondent would consider to be 'normal' healing) among 597 respondents with tattoos and 749 respondents with a body piercing.



§ Other complications for body piercing included damage to mouth, gums or teeth, rejection of body jewellery or other complications.

based on prior complaints received and polls conducted by public health during educational presentations at area schools. The upper age limit of 35 years was chosen to ensure that body art received by the respondent and information used to facilitate the decision making process was relatively recent.

As found in previous studies the prevalence of body piercing was higher than that of tattoos, with body piercing being more common among females (2,14-16), and multiple tattoos more common in males (3), although males and females were equally likely to have tattoos (2,15,16). Older respondents were more likely to have both tattoos and piercings, while the prevalence of body piercing (only) decreased with age (14). As in previous

studies the most commonly cited reasons for receiving body art were liking the way that it looked, self-expression and personal reasons (3-6).

As previously reported, the incidence of self-reported post-body art complications was higher for body piercing than for tattooing, as was the number of respondents who subsequently sought medical attention (2,3,5,15,16). Most complaints received by WDGPH in regards to body art are those associated with individuals receiving body art at a private home, where artists are operating without inspection by public health. These complaints are usually associated with premises sanitation or post-body art infections. Although respondents reported infections and healing complications associated with piercings

more frequently than with tattoos, most complaints received by the health unit are regarding tattoos. This could be explained by the fact that 11% of 595 respondents reported that they had previously received a tattoo from an artist operating out of their home, compared to only 3% of 744 with body piercings. While public health can approve home-based premises, there is currently only one such premises registered with WDGPH, with all other home-based artists operating without public health inspection or approval. Un-inspected premises may be more likely to take infection control shortcuts such as reusing needles, using unsterilized equipment or not using an appropriate surface disinfectant, all of which could potentially increase the risk of infection.

“An overwhelming 98% of 1,048 respondents indicating that if public health made inspection reports for premises offering body art services to the public available online, this would or might influence the decision where to go to get body art.”

“Currently there is no legal age limit in Ontario for body art, meaning that interested persons can technically receive body art at any age, although many shops will request parental consent if an individual is under the age of 16, citing ethical considerations as the main reason for doing so.”

Currently there is no legal age limit in Ontario for body art, meaning that interested persons can technically receive body art at any age, although many shops will request parental consent if an individual is under the age of 16, citing ethical considerations as the main reason for doing so.

Similar to previous studies, personal endorsement by a friend or family member far outweighed all types of advertising by a shop and merits consideration for future educational endeavours by public health (4, 6). Future educational messaging should attempt to persuade youth to recommend that friends and family only receive body art at premises inspected by public health in order to reduce the risk of subsequent complications and other regrets.

Individuals with body piercings were less likely to visit multiple shops before deciding where to go, and were more likely to find a shop/artist by walk-in, supporting the conclusion by Greif et al (1999) that receipt of body piercings appears to be more impulsive than tattoos (5).

The low percentage of respondents (67.5%) who felt that Hepatitis B was a risk associated with tattooing and body piercing may have been due, in part, to respondents being aware of their immunization history – as Hepatitis B vaccine is publicly funded in Ontario most respondents would likely have received Hepatitis B vaccine and may consider themselves immune, reducing the perceived risk of this virus. However, respondents were not asked about their immunization history.

With over 80% of respondents preferring to access health information

online and 98% reporting that inspection results would or may influence the premises they visit to receive body art, public health efforts should focus on creating youth-friendly web resources and posting inspection results online.

Tobacco, drug and alcohol use were significantly associated with having tattoos and/or piercings, consistent with previous studies which have identified a correlation between substance use and tattooing and piercing (1,2,5). However, the association between alcohol use and body art in this study should be interpreted with caution due to low cell counts.

Interestingly, many respondents were aware of EBM services and expressed an interest in receiving these in the future. Perhaps this is not surprising; as tattooing and body piercing have become more mainstream and acceptable in society, individuals seeking to express their individuality through body art may be driven to pursue less common forms of body art, leading to increased interest in EBM procedures.

Limitations

Although an objective of this study was to assess local prevalence of body art, many respondents listed a home address outside of WDG; students at the University of Guelph and other local post-secondary institutions may have provided their permanent address instead of their local address while in school. Respondents were asked to indicate their highest level of education; however, due to the retrospective nature of this study this is not necessarily representative of

education level at the time at which body art was received, particularly if this was many years previously.

The number of respondents who reported first receiving a body piercing at a young age (under 17) was high, as was the number of respondents who reported piercings received using an ear piercing gun (intended for use on ear lobes only); this may be due to individuals misreading the question and including the age at which ear lobe piercings were received. Although responses were received from individuals throughout the health unit's geographic jurisdiction, most respondents (88% of 1,020 respondents with a home address in WDG) resided in the City of Guelph. The survey was promoted more heavily in Guelph and this may have introduced selection bias, possibly increasing the number of respondents with body art and reducing generalisability of results to the general public.

Individuals with body art or with an interest in body art may have been more likely to participate in this survey, and may have introduced response bias. This may have contributed to the high prevalence of body art reported in this study, which was higher than that found in similar studies that actively recruited respondents and were likely less prone to response bias (3,14).

Promotion by the University of Guelph may also have introduced selection bias, increasing the number of female respondents (an estimated 61% of undergraduate students in 2011 were female) (17), respondents with occasional or regular alcohol use and respondents with higher education, although this would not

have impacted the level of education at the time of earlier body art, received prior to attendance at a post-secondary institution.

Conclusion

As tattoos and body piercings become more commonly accepted in society, more extreme forms of body art are becoming desirable forms of self expression and, due to the invasive nature of such services, present a risk for subsequent infections (7). Future educational efforts should be targeted at youth, ideally beginning under 10 years of age, and should take into account the large role of family and peer endorsement in influencing the type of body art received and the premises where this is ultimately obtained (4). Regardless of age, all respondents felt that infection control issues were important factors to consider – this could be used to highlight the risks associated with visited uninspected premises when considering future educational efforts and the online availability of such resources.


REFERENCES

1. Health Canada. Special Report on Youth, Piercing, Tattooing and Hepatitis C Trends and Findings, 2001. Toronto, ON: Hepatitis C Division, Health Canada. Available at: http://www.calgaryhealthregion.ca/publichealth/envhealth/program_areas/salons_spas_tattooing/documents/youth_piercings.pdf (Accessed January 31, 2014).
2. Laumann AE, Derick AJ. Tattoos and body piercings in the United States: A national data set. *J Am Acad Dermatol* 2006; 55:413-21.
3. Deschesnes M, Demers S, Fines P. Prevalence and Characteristics of Body Piercing and Tattooing Among High School Students. *Can J Public Health*, 2006. Accessed online at: <http://journal.cpha.ca/index.php/cjph/article/viewFile/750/750>
4. Schorzman CM, Gold MA, Downs JS, Murray PJ. Body Art: Attitudes and Practices Regarding Body Piercing Among Urban Undergraduates. *J Am Osteopath Assoc*. 2007; 107:432-438
5. Greif, J et al. Tattooing and Body Piercing: Body Art Practices among College Students. *Clin Nurs Res* 1999 8:368.
6. Vaughn SM, Eichold II BH. Body Piercing and Tattooing Perspectives. *Clin Nurs Res* 2001; 10:424.
7. Walters, Janice. Board of Health Report #BH.01.03.02.2711 Extreme Body Modification, 2011. Guelph, ON: Wellington-Dufferin-Guelph Public Health, 2011.
8. Ontario. Ministry of Health and Long-Term Care. Infection Prevention and Control in Personal Services Settings Protocol, 2008. Available at: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/infection_prevention_personal_services.pdf (Accessed February 14, 2014).
9. Ontario. Health Protection and Promotion Act. R.S.O.1990. Chapter H.7. Available at: https://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm (Accessed February 14, 2014).
10. Ontario. Ministry of Health and Long-Term Care. Infection Prevention and Control Best Practices for Personal Service Settings, 2009. Available at: http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/docs/pssp_2008.pdf (Accessed June 20, 2013).
11. National Statistical Service. Sample Size Calculator. Accessed online at: <http://www.nss.gov.au/nss/home.nsf/NSS/0A4A642C712719DCCA2571AB00243DC6?openDocument> (Accessed February 1, 2013).
12. StataCorp. *Stata Statistical Software: Release 12*. StataSE. College Station, TX: StataCorp. 2011.
13. Health Canada. Research Ethics Board – Ethics Review of Research Involving Humans – Administrative Policy and Procedure Manual. 2009. Available at: http://www.hc-sc.gc.ca/sr-sr/pubs/advice-avis/reb-cer/index-eng.php#t3_5 (Accessed February 4, 2013).
14. Bone A, Ncube F, Nichols T, Noah ND. Body Piercing in England: a survey of piercing at sites other than earlobe. *BMJ*. Accessed online at: http://www.bmj.com/highwire/filestream/373724/field_highwire_article_pdf/0/1426
15. Mayers LB, Chiffrieller SH. Body Art (Body Piercing and Tattooing) among Undergraduate University Students: "Then and Now". *J Adolesc Health*, 2008; 42: 201-203
16. Mayers LB, Judelson DA, Moriarty BW, Rundell KW. Prevalence of Body Art (Body Piercing and Tattooing) in University Undergraduates and Incidence of Medical Complications. *Mayo Clin Proc*. 2002; 77:29-34.
17. Long, M (2013). India Semester Abroad 2014. *The Ontarion*. Available at: <http://www.theontarion.com/2013/10/india-semester-abroad-2014/> (Accessed January 31, 2014) *

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Preventing Methicillin-Resistant *Staphylococcus aureus* (MRSA) transmission in pediatric health care facilities – a Canadian Nosocomial Infection Surveillance Program (CNISP) cross-sectional survey

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ABSTRACT

Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections and colonization have increased among Canadian children in both the community and hospital setting. Although strategies to prevent and limit spread of MRSA in the hospital setting are recommended, they can be challenging to implement in the course of providing specialized care to hospitalized infants, children, youth and their families. The purpose of this Canadian Nosocomial Infection Surveillance program (CNISP) survey was to determine existing infection control practices in Canadian pediatric healthcare settings.

Methods

Hospitals providing care to children in 2010 were eligible to participate in this cross-sectional survey, as was posted on the Canadian and province of Quebec infection prevention and control professional association websites with widespread invitations to encourage participation. Survey items were generated by the Pediatric MRSA Working Group of the CNISP. Data were extracted, cleaned and analyzed using Microsoft Excel (2007/2010) and additional analyses conducted using Epicalc 2000 Version 1.02, at the Public Health Agency of Canada.

Results

Fifty hospitals responded; 88% were acute care and 96% conducted inpatient admission screening. Of the 96% of hospitals conducting MRSA screening, 88% screened children if they had a history of any prior hospital admission, 76% if the child was known to be MRSA-positive, and 88% if the child had a history of contact with MRSA. All hospitals applied

Additional Precautions (AP) to confirmed MRSA positive patients and 46% applied AP to screened patients while awaiting screening results. Implementation of the use of gowns, gloves, masks and/or eye protection varied across hospitals and patient care areas. Twenty-two percent reported routinely decolonizing MRSA patients in specific circumstances, and 46% had a policy regarding decolonization. Although most hospitals flagged health records of MRSA positive patients, criteria to remove a flag from the health record varied.

Conclusions

Although policies and procedures to prevent MRSA transmission in the health care setting are routine in Canadian pediatric settings, there is variation in application of national guidelines. Evidence-based guidelines specific to the care of infants, children and youth would help improve consistency across care settings, and understanding and compliance with infection prevention and control policy by health care providers, patients and families.

KEY WORDS:

Methicillin resistant *Staphylococcus aureus*, infection prevention and control, child, health care associated infection

INTRODUCTION

Methicillin-resistant *Staphylococcus aureus* colonization and infection has increased in Canadian children [1-3], as it has in the United States [4]. The Canadian Nosocomial Infection Surveillance Program documented an increase in MRSA colonization/infection rates in inpatients from 0.06 to

TABLE 1. Reported infection prevention and control practices for screening and isolation of the neonate born to an MRSA positive mother, or with an MRSA positive family member in 44 hospitals providing newborn care^a.

Practice	N	%
If mother is MRSA positive:		
Neonate is assumed to be MRSA positive, <i>not</i> screened, and placed on additional precautions	4	9
Neonate is assumed to be MRSA positive, screened, not placed on additional precautions	3	7
Neonate is assumed to be MRSA positive, screened, placed on additional precautions until results known	13	30
Neonate is assumed to be MRSA positive, screened, placed on additional precautions regardless of screening results	3	7
If a family member is MRSA positive:		
Required to wear personal protective equipment (PPE) when visiting the newborn, or in certain circumstances	30	68
Other intervention to permit visit ^b	9	19
Family member not allowed to visit newborn	2	4
^a –Note that totals for individual practices may be less than 44, as not all hospitals answered all questions.		
^b no contact with other infants, PPE for handling baby, restricted from visiting shared lounge area, educated regarding hand hygiene and staying in patient room as much as possible		

2.74/10,000 patient days from 2000 to 2010 [1]. Although skin and soft tissue infections were the most common clinical presentation, life-threatening infections and disruptive outbreaks occur [1, 5-6], and monetary costs associated with management of drug-resistant infection are considerable.

A number of guidelines to deal with this emerging public health problem are available [7-12]. In the healthcare setting, strategies to prevent transmission of MRSA from colonized or infected patients to health care workers, their visitors and families include screening of high risk patients to identify asymptomatic carriers or previously undiagnosed infections, use of Routine Practices and Additional Precautions, patient placement, and environmental cleaning. The pediatric setting can present unique challenges to the health care provider implementing Contact Precautions, screening procedures and patient placement. For example, families increasingly stay with the hospitalized child as a part of family centred care, provision of care to infants and young children requires very close contact, and education of the patient

must adapt to the changing physical, emotional and intellectual development of the child at different ages.

The purpose of this CNISP survey was to determine if recommended practices for infection prevention and control to prevent MRSA transmission in the pediatric health care setting are consistent across Canada.

Methods

The study design was a cross-sectional survey. The target population was infection prevention and control professionals working in settings providing health care to children in Canada. The goal was to determine infection prevention and control practices related to screening for MRSA and use of AP and other practices to interrupt transmission of MRSA in Canadian hospitals caring for pediatric patients. Survey items and the final questionnaire were developed by the Pediatric MRSA Working Group of CNISP in teleconferences and by email. The final survey had 86 items, and in pilot testing took about 20 minutes to complete. The questionnaire was posted on the websites of the Canadian and

Quebec infection control associations (Community and Hospital Infection Control Association CHICA-Canada and Association des infirmières en prévention des infections) from 20 January 2010 to 25 February 2010. Invitations and a series of reminders to complete the survey were sent by e-broadcast to members of these associations, and also re-broadcast to members of the CHICA Pediatric Interest Group. The full questionnaire is available by contacting cnisp-pcsin@phac-aspc.gc.ca. No paper copies of the questionnaire were distributed.

Any Canadian hospital providing care to children, defined as those age ≤ 18 years, was eligible to participate. Only one respondent per institution was invited to submit answers to the survey questions. Participants provided the name of their institution so that duplicate responses could be identified. When duplicate questionnaires were found with different responses from the same institution, the institutional representative was contacted by the study team to determine the correct answers.

Participants were informed that only aggregate data would be presented and no individual hospital data would be published.

Data were extracted, cleaned and analyzed using Excel 2007/2010 (Microsoft, Redmond, Washington), at the Public Health Agency of Canada. Additional analyses describing regional differences were conducted using Epicalc 2000 Version 1.02 (J & Myatt M, Brixton Books, Brixton, UK). Results were not analyzed when response rates for eligible individual questions were less than 30%.

Results

Fifty hospitals responded; 88% (44/50) were acute care and 12% were community hospitals. Hospitals participating in CNISP comprised 38% of the sample (19/50). In 2010 there were 13 stand-alone pediatric hospitals in Canada; 9/13 of these institutions responded to the survey. All 10 provinces of Canada were represented among respondents: West (British Columbia, Alberta, Saskatchewan, Manitoba; 24%, n=12), Central (Ontario; Québec 60%, n=30) and East (Atlantic provinces; 16%, n=8). Although hospitals in the Territories were invited

to participate, no hospital responded. Denominators for some questions are less than 50 where the respondent did not answer a survey question.

Screening practices

Only two hospitals were not conducting any MRSA surveillance screening on admitted patients (2/48; 4%). Of the 96% of hospitals conducting MRSA screening, 92% (44/48) screened children if they had a history of any prior hospital admission or if the child had a history of contact with MRSA, and 76% (31/41) if the child was known to be MRSA-positive. Screening samples were obtained from the nasal mucosa (100% of respondents), wounds (71%), the peri-rectal area (54%), and "other" sites (such as umbilicus, indwelling devices, endotracheal aspirates (71%). The frequency of MRSA colonization or infection was reported as a routine component of surveillance in 45/50 hospitals and provided to Senior Management and/or to the provincial health ministry in 84% and 73% of hospitals, respectively.

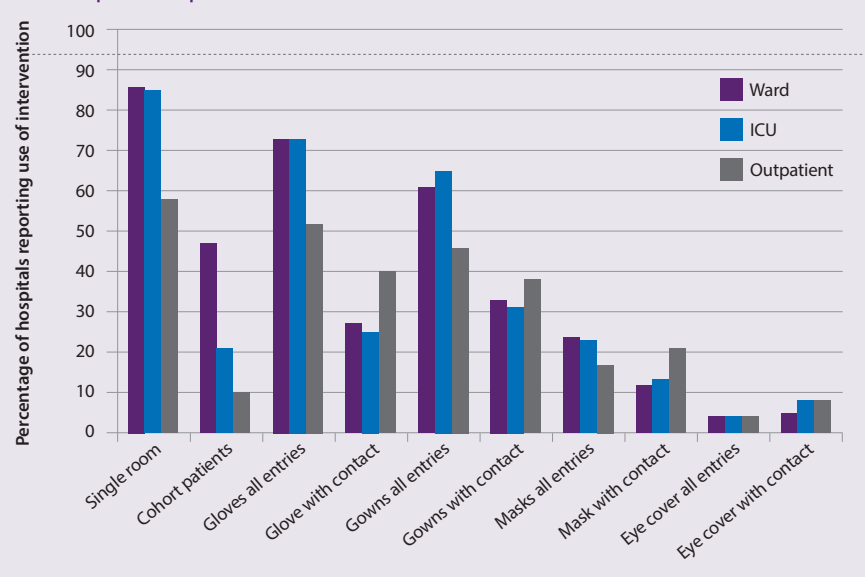
In the 44 hospitals that provided newborn care, five hospitals (11%) routinely screened all neonates for MRSA. Management of the baby born to an MRSA-positive mother varied. The most common strategy for management of a newborn born to an MRSA positive mother was to assume the child was colonized and use AP until the screening result for the newborn was known (Table 1).

If an exposure to MRSA occurred during a child's hospital stay, 86% (43/50) of hospitals would screen the exposed patient for MRSA. An exposed roommate was most likely to be screened (41/43; 95%), while patients on the same unit were unlikely to be screened (<30% of hospitals).

In the ambulatory setting only one hospital conducted routine MRSA screening on all outpatients. When screening was conducted in the outpatient setting, the most common indications were previously MRSA positive patient or a history of MRSA contact.

Prevalence surveys for MRSA on inpatients occurred in 19 hospitals (38%). The most common units surveyed were hemodialysis, surgery, and hematology-oncology.

FIGURE 1. Use of personal protective equipment and patient placement in MRSA positive patients.



Use of Additional Precautions

Use of AP for confirmed MRSA positive patients was routine. Forty-six percent applied AP to screened patients while awaiting laboratory results. The specific personal protective equipment (PPE) used and room placement assigned varied across institutions and care settings (Figure 1). Use of dedicated patient equipment was common, as was placement in a single room (86%). Glove and gown use varied in non-ICU settings, but use with every room entry (rather than with patient contact) was most common (gloves; 75%, n=36/48 and gowns; 60%, 30/50). Most facilities (96%; 47/49) required use of PPE by family members visiting MRSA positive patients.

The majority of hospitals (94%) flagged the health record of MRSA positive patients. Most facilities discontinued AP (62-74%), after three consecutive negative cultures, as opposed to one or two negative cultures, depending on the placement of the patient and regardless of status as colonized or infected with MRSA. Routine decolonization of MRSA patients was reported by 22% of facilities and 46% reported having a policy relating to decolonization of patients. The most common reasons for this practice were to facilitate removal of AP in the long stay patient, clinician preference, repeated infections, or in the setting of an outbreak.

The complete survey results in tabular format are available by contacting cnisp-pcsin@phac-aspc.gc.ca.

Discussion

Pediatric health care settings across Canada, as demonstrated in this study, have responded to the increased challenge of MRSA in community and health care facilities by implementing infection prevention and control measures to prevent transmission of this antibiotic-resistant organism (ARO) to patients, families and health care staff. However, the variation in application of policies and practices documented by this study suggests there is not complete unity of thought about which measures should be used in settings that provide care to infants, children and youth and their families.

Multiple guidelines to prevent nosocomial spread of AROs in general, and MRSA specifically, are available, including those recently produced by the Public Health Agency of Canada (PHAC)[13], some Canadian provinces [14-15] and American organizations such as the U.S Centers for Disease Control and Prevention and the Association for Professionals in Infection Control and Epidemiology (APIC). PHAC guidelines recommend Contact Precautions in addition to Routine Practices for the prevention of ARO in acute care

settings, as well as other measures to be determined on a case-by-case basis in symptomatic patients. The key features of Contact Precautions are the use of gloves and gowns for interactions with the patient or their environment, the use of dedicated medical equipment, and placement in a single room (or cohorting). AP are not recommended in the ambulatory or pre-hospital setting for asymptomatic patients in that document [13].

This survey indicates that there is fairly consistent practice with regard to screening in the acute care and ambulatory setting, use of AP for non-family visitors, and flagging of patients previously recognized as MRSA carriers. Variation in practice is most prominent with regard to recommended PPE (gowns, gloves, masks) for family members and visitors and for newborns and mothers. These situations are particular to the pediatric setting, in which close and direct contact with visitors and health care workers occurs. Young or developmentally delayed children also possess behavioural characteristics that facilitate infection spread such as incontinence and inadequate hygiene [16].

The recognition of the importance of family centred care, that is, the understanding that the family is a constant in the child's life and a partner in the health care team, must be considered along with the need to protect others in the health care setting. For example, it may seem contrary to family centred care to ask family members of a child with MRSA to wear PPE when they may also be colonized and do not take such measures in the household. A requirement to have family members wear PPE could be frightening to the child, interrupt normal family interactions, and be cumbersome to the families. There is a paucity of evidence that such a requirement would reduce MRSA transmission in the healthcare setting. In contrast, proponents of a policy to have family members wear PPE could argue that although the adults in that family would be unlikely to have direct contact with other patients or staff, siblings of the patient could do so in a playroom or on the ward, and free movement of colonized adult visitors could result in environmental contamination. Similarly a newborn of a MRSA positive mother screened on admission to

the neonatal intensive care unit may not be colonized at birth, yet during ongoing skin-to-skin contact with the mother, or other family members, become colonized. These and other situations unique to this setting are not discussed in current guidelines. Guidelines, especially those that are evidence-based, specific to the care of infants, children and youth would help improve consistency across care settings and improve understanding and compliance of health care providers with Contact Precautions in addition to Routine Practices for patients colonized or infected with MRSA.

Given the lack of evidence for the efficacy of MRSA decolonization regimens [17], it is surprising that 22% of facilities report a policy to routinely implement this practice. The most common reason given was to facilitate removal of AP in the long-stay patient. Indeed, prolonged single room placement of a child is difficult and potentially harmful for a child, challenging for the family, and a concern to health care providers. In such circumstances the health care team and the family may wish to use this intervention even though the likelihood of success is limited.

In summary, this cross sectional survey of 50 acute care and community hospitals in Canada demonstrates that infection prevention and control practices to prevent MRSA transmission are in place across the country, albeit with variation in practice. More consistent and evidence based guidelines for the pediatric setting could improve confidence in recommendations and hence compliance with them.

REFERENCES

1. Matlow, A., et al., *National surveillance of methicillin-resistant Staphylococcus aureus among hospitalized pediatric patients in Canadian acute care facilities, 1995-2007*. *Pediatr Infect Dis J*, 2012. **31**(8): p. 814-20.
2. Golding, G.R., et al., *High rates of Staphylococcus aureus USA400 infection, Northern Canada*. *Emerg Infect Dis*, 2011. **17**(4): p. 722-5.
3. Simor, A.E., et al., *Methicillin-resistant Staphylococcus aureus colonization or infection in Canada: National Surveillance and Changing Epidemiology, 1995-2007*. *Infect Control Hosp Epidemiol*, 2010. **31**(4): p. 348-56.
4. Gerber, J.S., et al., *Trends in the incidence of methicillin-resistant Staphylococcus aureus*

- infection in children's hospitals in the United States. *Clin Infect Dis*, 2009. **49**(1): p. 65-71.
5. Keynan, Y. and E. Rubinstein, *Staphylococcus aureus Bacteremia, Risk Factors, Complications, and Management*. *Crit Care Clin*, 2013. **29**(3): p. 547-62.
6. Laing, I.A., A.P. Gibb, and A. McCallum, *Controlling an outbreak of MRSA in the neonatal unit: a steep learning curve*. *Arch Dis Child Fetal Neonatal Ed*, 2009. **94**(4): p. F307-10.
7. Irvine, J., Canadian Pediatric Society First Nations, Inuit and Metis Health Committee, *Community-associated methicillin-resistant Staphylococcus aureus in Indigenous communities in Canada*. *Paediatr Child Health*, 2012. **17**(7): p. 385-6.
8. Robinson, J.L. and M.I. Salvadori, *Management of community-associated methicillin-resistant Staphylococcus aureus skin abscesses in children*. *Paediatr Child Health*, 2011. **16**(2): p. 115-8.
9. Allen, U.D., *Public health implications of MRSA in Canada*. *CMAJ*, 2006. **175**(2): p. 161.
10. Siegel, J.D., et al., *2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings*. *Am J Infect Control*, 2007. **35**(10 Suppl 2): p. S65-164.
11. Public Health Agency of Canada, *Routine Practices and Additional Precautions Assessment and Educational Tools*. 2012, Public Health Agency of Canada: Ottawa.
12. Laboratory Center for Disease Control, H.C., *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care CCDR*, 1999(2554): p. 1-142.
13. *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings*. , 2012, Public Health Agency of Canada.: Ottawa. 2012. <<http://www.phac-aspc.gc.ca/nois-sinp/guide/ac-sa-eng.php>>
14. Provincial Infection Control Network of British Columbia 2013, *Antibiotic Resistant Organisms Prevention and Control Guidelines for Healthcare Facilities*. 2013, Provincial Health Services Authority, : Vancouver. p. 46.
15. Provincial Infectious Disease Advisory Committee on Infection Prevention and Control (PIDAC-IPC), Ontario Agency for Health Protection and Promotion (Public Health Ontario), Annex A - Screening, testing and surveillance for antibiotic-resistant organisms (ARO). *Annexed to Routine Practices and Additional Precautions in all Health Care Settings*. Nov 2012 Toronto, ON. http://www.publichealthontario.ca/en/eRepository/RPAP_All_HealthCare_Settings_Eng2012.pdf
16. Moore DL, *Essentials of paediatric infection control*. *Paediatr Child Health*. , 2001. **6**(8): p. 571-79.
17. Loeb MB, et al., *Antimicrobial drugs for treating methicillin-resistant Staphylococcus aureus colonization*. *Cochrane Database Syst Rev* 2003;4:CD003340. 🌸

Asking for hand hygiene: Are patients comfortable asking, and, are healthcare providers comfortable being asked?

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ABSTRACT

To decrease the risk of healthcare acquired infections, hand hygiene is ideally performed at the point of service. Patients expecting and asking healthcare providers (HCPs) for hand hygiene may increase hand hygiene compliance in health care situations. Two surveys were distributed to determine how comfortable the public in the Algoma District would be asking their HCP for hand hygiene, and how comfortable doctors and nurses would be if they were asked for hand hygiene by patients. Eighty-six percent (86%) of respondents believed they are at a higher risk of infection if a doctor or nurse did not wash their hands before touching them. Fifty percent of the public was uncomfortable asking their HCP for hand hygiene. Ninety-five percent (95%) of HCPs were comfortable being asked to perform hand hygiene. Finally, half of the public surveyed indicated their comfort would increase if they knew HCPs did not mind being asked, while 88% of HCPs surveyed indicated that performing hand hygiene in front of the patient is the best way to reassure them that hand hygiene is being performed. The report concluded that performing hand hygiene in front of the client is the best solution to address the patients' discomfort. Promoting this as a universal standard of care is encouraged.

KEY WORDS:

Hand Hygiene; Patient Attitudes;
Professional-Patient Relations;
Empowerment

INTRODUCTION

It is estimated that approximately 220,000 people admitted to hospital in Canada each year acquire infections

while being treated for something else, resulting in more than 8,000 deaths (1).

The World Health Organization (2), Centre for Disease Control (3), Public Health Agency of Canada (4), and Public Health Ontario (5) all publish documents on infection prevention in health care settings. Within these guidelines, hand washing and hand hygiene are considered fundamental practices in infection prevention and control in health care settings.

The province of Ontario requires public reporting of health-care associated infections through the Health Quality Ontario website. Hand Hygiene Compliance is reported for each facility. "Proper hand hygiene... can reduce the spread of infection, associated treatment costs, hospital lengths of stays, readmissions, wait times, and prevent deaths" (6). The provincial average (April 2012-March 2013) for hand hygiene compliance for before initial patient/patient environment contact was 85.6% compared to 91.2% after patient/patient environment contact.

Shira I. Doron, MD, MS, an assistant professor of medicine at Tufts University School of Medicine in Boston, Massachusetts, postulates that before patient contact compliance rates for hand hygiene may be lower than after patient contact compliance rates as a result of self-protection, and that hand washing after the patient will protect the next patient (7). This may not take into account subsequent contamination before the next patient. She also puts forth the idea that:

"If a healthcare worker washed before touching a patient every time, and never washed after touching a patient, there would be no transmission

of microorganisms between patients on healthcare workers' hands. So to patients, only the before-care hand hygiene really matters." (7)

Increasing hand hygiene compliance rates will increase protection of the patient. While it is apparent that improved hand hygiene compliance has numerous benefits, ways to accomplish this are numerous and diverse. One potential way may

be greater involvement of the patient. Involving the patient in this effort advocating for their own protection has been considered by infection control practitioners.

Many programs exist to promote hand hygiene in health care settings to decrease the risk of health care acquired infections. Some programs promote patient involvement through the use of buttons, posters, and videos

encouraging patients to ask HCPs about hand hygiene. In Ontario, the Public Health Ontario Just Clean Your Hands program (8) and the World Health Organization 5 Moments for Hand Hygiene (9) are comprehensive programs promoting hand hygiene before patient or patient environment contact to HCPs.

Since hand hygiene performed immediately before contact with a patient is ideal and considered to be the most efficient time to reduce healthcare-associated infections (HAIs), would patients be comfortable asking their HCP to perform hand hygiene before touching them to participate in their care? Studies of patient education and empowerment have had success, however research into their comfort level is lacking.

METHODS

Two surveys were designed and distributed in the Algoma District during the summer and fall of 2012.

The first survey assessed the public comfort level about asking HCPs to perform hand hygiene. Paper surveys were distributed and collected from various locations around Sault Ste. Marie including Algoma Public Health, city hall, senior centres and libraries. Digital surveys were distributed by email to employees of Algoma Public Health, City of Sault Ste. Marie, and Public Utilities Commission with a request to further distribute to their contacts. The questions on the digital and paper surveys were the same. One response option for one question had been changed after the paper surveys were distributed and that different response was captured by inputting it as a comment.

The second survey was distributed through the Physician Newsletter and by email to physicians and nurses in the Algoma District to determine their comfort level being asked for hand hygiene by patients.

All paper surveys were manually entered into the digital survey program, SurveyMonkey®, before evaluating. Percentages were rounded to the nearest tenth.

TABLE 1: Summary of responses from the survey of the public

Question	Health care provider type	
	Doctor	Nurse
<i>Would you feel comfortable asking a HCP to wash their hands or use hand sanitizer before touching you?</i>		
Not comfortable at all	17.0	13.8
Not very comfortable	39.1	34.9
Somewhat comfortable	20.7	24.4
Comfortable	14.0	16.6
Very comfortable	9.3	10.3
<i>Why may you feel uncomfortable asking a HCP for hand cleaning?</i>		
Shy	15.1	14.5
Embarrassed	13.2	13.0
Don't want to offend	63.1	58.6
May affect the level of service I receive	33.3	32.3
I am already comfortable asking	12.2	17.6
Other	12.2	7.0
<i>What would increase your comfort to ask a HCP to clean their hands?</i>		
Poster or sign in room	35.8	33.2
Name tag or sticker "Ask me if I washed my hands"	52.0	55.8
Knowing they wouldn't mind being asked	50.6	49.3
Reward for asking	6.9	5.3
Other	6.0	7.2
<i>Have you asked a HCP in the past to clean their hands?</i>		
Yes	6.5	7.7
No	93.5	92.3
HCP: health care provider		

RESULTS

Survey of the public

A total of 433 people in Algoma responded to the public survey.

Seventy-seven percent (77%) of respondents were women. Most respondents (62%) were between 35 to 64 years old, and ninety percent (90%) had post-secondary education (college or university). Twenty-four percent (24%) of respondents of the public survey identified themselves as HCPs.

A summary of the responses from the survey of the public can be found in Table 1. More respondents were uncomfortable asking a physician for hand hygiene (56%) than asking a nurse (49%). When asked why they may be uncomfortable, respondents indicated they would not ask because they did not want to offend HCPs (58%) or they believed it may affect the level of service received (32%).

The public added a total of 80 comments about why they may be uncomfortable asking a Physician and Nurse for hand hygiene. Nineteen (19) of these comments were removed from review because they were responses to the different option on the paper version of the survey that were input as comments. Respondents indicated that they may be uncomfortable asking the physician for hand hygiene because hand cleaning is already being done.

The remaining 61 comments about reasons for discomfort, included:

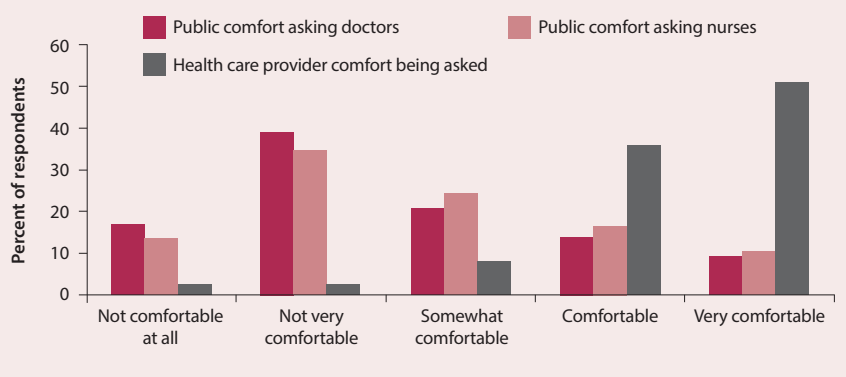
- HCP should know to do it/ professional standard (30%, 18/61)
- Patient assumed it is being done (28%, 17/61)
- Patient were concerned about reaction (12%, 7/61)

A suggestion was made that “sanitizer stations should be mounted where patients can access or view staff.”

The survey asked respondents what would increase their comfort to ask their HCP to clean their hands. A nametag or sticker (“Ask me if I washed my Hands”) was the top choice of respondents, followed closely by knowing that the HCP would not mind being asked.

There were 55 total comments submitted with what might increase

FIGURE 1: Public’s comfort level asking health care providers about hand hygiene and health care providers’ comfort level about being asked about hand hygiene



their comfort asking for hand hygiene. Comments fell into six general categories. The top three categories were:

- Should not have to ask/professional standard (29%)
- HCP should clean hands in front of patient (24%)
- Nothing (would increase comfort asking) (18%)

The comments suggested the patients may not want to ask or they feel they should not have to ask.

More than 90% of public respondents indicated they had not asked their HCP for hand hygiene. HCPs reported having requested hand hygiene from a nurse or physician more often than the general public (11% compared to 7% asking physicians, and 14% compared to 8% asking nurses). This was mirrored by healthcare providers reporting that eleven percent (11%) of respondents had been asked to perform hand hygiene by patients in the past and only eight percent (8%) of the public reported having asked.

Eighty-six percent (86%) of all public respondents believed they were at a higher risk of infection if a doctor or nurse does not wash their hands before touching them. Responses were higher from HCPs (93%) and respondents over 65 years (92%).

Survey of nurses and physicians

A total of 150 HCPs responded to the survey. Eighty-one percent (81%) of respondents were female, and

fifty-two percent (52%) indicated having 20 or more years of experience.

Of the 137 respondents indicating their role as a HCP, twenty-six percent (26%) were physicians and seventy-four percent (74%) indicated nurse/nurse provider. Ninety-six percent (96%) of physician respondents were male.

A summary of the responses from the survey of nurses and physicians can be found in Table 2. Ninety-five percent (95%) of health care respondents were at least “comfortable”, and more than fifty percent (50%) were “Very Comfortable” being asked by patients to clean their hands before touching them (if they did not perform hand hygiene in front of the patient).

Most healthcare practitioners in the survey (86%) would perform hand hygiene again when asked if they had not performed hand hygiene in front of the patient. Fourteen percent (14%) indicated they would not perform hand hygiene again but would explain the reason. Men were more likely (36%) to decline with an explanation than women (9%).

HCPs (88%) in the study indicated that performing hand hygiene in front of the patient is the best way to reassure them that hand hygiene is being performed. A nametag or button (33%, “Ask me if I cleaned my hands”) or a poster/sign in the room (20%) were not as popular. More women (24%) supported a nametag compared to 10% men. Sixteen percent (16%) of

male respondents indicated “Nothing” would reassure patients compared to three percent (3%) female responses.

DISCUSSION

Overall, results of the surveys indicate that the public is not comfortable asking for hand hygiene; yet HCPs are comfortable being asked (95%) (Figure 1). People were less comfortable asking a physician than asking a nurse.

Longtin et al. (10) found that for patients who had no intention of asking for hand hygiene, the top four reasons included beliefs that it is not the patient’s role, feeling of embarrassment or awkwardness, belief

that caregivers should know to do it, and the perception of being impolite, disrespectful, and dishonest.

After participating in an intervention program, McGuckin et al. (11) found that 62% of patients were comfortable asking for hand hygiene and had received a positive response from the HCP.

Since 51% of the surveyed public indicated that their comfort level in asking for hand hygiene would increase if they knew HCPs do not mind being asked, it is important to promoting to the public that almost all (95%) of the surveyed HCPs were comfortable being asked about hand hygiene.

Being invited or given explicit permission have been determined important to increase intention to ask (12-14). However, after education and promotion activities with patients, only fifty-seven percent (57%) were willing to ask for hand hygiene (15).

A patient’s intention to ask for hand hygiene more than doubled if they were explicitly invited to ask by their HCP as this reassured the patient and addressed concerns of disrespect (16).

The research suggests that although prompts, reassurance, and education may increase patient participation in asking for hand hygiene, the responses of participation or intention to participate reported were still low, below 65%.

The public in the survey appeared to realize the importance of hand hygiene in protecting their health recognizing that they are at higher risk of infection if a HCP does not clean their hands before touching them. Encouraging them to ask HCPs for hand hygiene may be an important step to increase infection prevention at the point of care. However, this may be difficult as more than half respondents indicated they would be uncomfortable doing so. Their comments suggesting that HCPs clean their hands in front of the patients would eliminate the issue and reassure the patient. It would also reinforce the patient’s belief in the professionalism of the HCP.

Conversely, HCPs may benefit from knowing patients are not comfortable asking for hand hygiene. Duncanson and Pearson (17) noted that patient involvement is necessary in their safe care, though, ultimately it is the responsibility of the professionals.

Garcia-Williams et al. found physicians and nurses in a hospital setting in Atlanta, Georgia were generally comfortable being asked by patients. However, they found that physicians indicated that how they were asked was important, while Nurses reported that being asked would be insulting or embarrassing. “Physicians and nurses must be informed that a patient asking is not being difficult and patients must

TABLE 2: Summary of response from the survey of health care providers

Question	Percentage of respondents
<i>If you did not perform hand hygiene in front of the patient, how comfortable would you be if they asked you to clean your hands before you touched them?</i>	
Not comfortable at all	2.7
Not very comfortable	2.7
Somewhat comfortable	8.1
Comfortable	35.8
Very comfortable	50.7
<i>If you had performed hand hygiene but not in front of the patient, would you perform hand hygiene again if they asked you?</i>	
Yes	85.9
No, with an explanation to the patient	14.1
No, without an explanation	0.0
<i>Eighty-six percent (86%) of the Algoma public that responded to our survey felt that they would have a higher risk of infection if their HCP did not perform hand hygiene prior to touching them. What would you suggest to reassure your patients that hand hygiene is being performed?</i>	
Perform hand hygiene always in front of patient	87.5
Place a poster or a sign in room	20.1
Wear a name tag or button “Ask Me if I Washed My Hands”	32.6
Nothing	7.6
Other	9.7

be reassured that asking an HCP to perform HH will not result in a diminished level of care" (18).

Surveyed HCPs indicated that performing hand hygiene in front of the patient was the best way to reassure the patient hand hygiene was being done. Adopting this practice as the standard would address the problem of patients' discomfort of asking by eliminating the possible need of asking and promote the professionalism and commitment of HCPs' to prevent infection. It also protects patients that may not be capable in participating in their care and protection. Patient participation in asking for hand hygiene assumes that the patient is able to ask. An unconscious or incapacitated patient is not able (19,20).

LIMITATIONS

A limitation of the survey was the method of distribution through employment emails which limited job diversity of the respondents. Males and young people appear not responsive or may not have been equally represented in the distribution.

Response options to the question asking the public what would increase their comfort asking for hand hygiene should have included "nothing would increase their comfort" to capture if there were respondents who would never feel comfortable or that nothing would make them comfortable.

CONCLUSION

The public was not comfortable asking their HCP for hand hygiene and other research suggests that the public may be hesitant to ask even after education and other interventions.

Patient asking for hand hygiene for their own protection does not appear to be a strategy for improved hand hygiene in which the public wants to participate.

While the HCPs surveyed were comfortable being asked about their hand hygiene, it may be best that HCP make a habit of performing hand hygiene in front of the patient. This is the best way to reassure patients that they are taking precautions for infection control and prevention. This practice

may eliminate some of the discomfort associated with asking for hand hygiene and ultimately reduce the incidence of healthcare service acquired infections.

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REFERENCES

1. Zoutman DE, Ford BD, Bryce E, Gourdeau M, Hebert G, Henderson E, et al. (2003). The state of infection surveillance and control in Canadian acute care hospitals. *American Journal of Infection Control*. 31(5), 266-72.
2. World Health Organization. (2009, January 1) *WHO Guidelines on Hand Hygiene in Health Care First Global Patient Safety Challenge Clean Care is Safer Care*. Retrieved from http://whqlibdoc.who.int/publications/2009/9789241597906_eng.pdf
3. Centers for Disease Control and Prevention. (2002). *Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Morbidity and Mortality Weekly Report* 51(No. RR16).
4. Taylor, J. (2012, January 1). *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings*. Retrieved from http://publications.gc.ca/collections/collection_2013/aspc-phac/HP40-83-2013-eng.pdf
5. Ontario Agency For Health Protection and Promotion. (2012) *Provincial Infectious Diseases Advisory Committee. Best Practices for Infection Prevention and Control Programs in All Health Care Settings, 3rd edition*. Toronto, ON: Queen's Printer for Ontario.
6. Health Quality Ontario. (n.d.) *About Patient Safety Public Reporting*. Retrieved from <http://www.hqontario.ca/public-reporting/patient-safety/about-patient-safety-public-reporting>
7. Melville, N.A. (2011, May 20) *Medscape Medical News WHO Hand-Hygiene Initiative Largely Ignored*. Retrieved from <http://www.medscape.com/viewarticle/743111>
8. Public Health Ontario. (n.d.) *Just Clean Your Hands*. Retrieved from <http://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/JustCleanYourHands/Pages/Just-Clean-Your-Hands.aspx>
9. World Health Organization. (n.d.) *Five moments for hand hygiene*. Retrieved from http://www.who.int/gpsc/tools/Five_moments/en/
10. Longtin Y, Sax H, Allegranzi B, Hugonnet S, Pittet D. (2009). Patients' beliefs and perceptions of their participation to increase healthcare worker compliance with hand hygiene. *Infection Control and Hospital Epidemiology*, 30(9), 830-839.
11. McCuckin M, Waterman R, Storr J, Bowler ICJW, Ashby M, Topley K, Porten L. (2001) Evaluation of a patient-empowering hand hygiene programme in the UK. *Journal of Hospital Infection* 48, 222-227.
12. Pittet D, Panesar SS, Wilson K, Longtin Y, Morris T, Allan V, Storr J, Cleary K, Donaldson L. (2011). Involving the patient to ask about hospital hand hygiene: a National Patient Safety Agency feasibility study. *The Journal of Hospital Infection*, 77(4), 299-303.
13. McCuckin M, Waterman R, Storr J, Bowler ICJW, Ashby M, Topley K, Porten L. (2001). Evaluation of a patient-empowering hand hygiene programme in the UK. *Journal of Hospital Infection* 48, 222-227.
14. McCuckin M, Storr J, Longtin Y, Allegranzi B, Pittet D. (2011). Patient empowerment and multimodal hand hygiene promotion: a win-win strategy. *American Journal of Medical Quality*, 26(1), 10-17.
15. McCuckin M, Waterman R, Porten L, Bello S, Caruso M, Juzaitis B, Krug E, Mazer S, Osrawski S. (2011). Patient education model for increasing handwashing compliance. *American Journal of Infection Control* 27(4), 309-314.
16. Longtin Y, Sax H, Allegranzi B, Hugonnet S, Pittet D. (2009). Patients' beliefs and perceptions of their participation to increase healthcare worker compliance with hand hygiene. *Infection Control and Hospital Epidemiology*, 30(9), 830-839.
17. Duncanson V, Pearson LS. (2005). A study of the factors affecting the likelihood of patients participating in a campaign to improve staff hand hygiene. *British Journal of Infection Control*, 6 (26), 29.
18. Garcia-Williams A, Brinsley-Rainisch K, Schillie S, Sinkowitz-Cochran R. (2010) To ask or not to ask?: the results of a formative assessment of a video empowering patients to ask their health care providers to perform hand hygiene. *Journal of Patient Safety*, 6(2), 80-85.
19. Hill D. (2011). Hand hygiene: are we trying to make the patient the fail-safe system? *Journal of Hospital Infection*. 79(4), 381-382.
20. Torrey, T. (2013, October 19). *About.com Patient Empowerment, How to Ask Doctors and Other Providers to Wash Their Hands*. Retrieved from <http://patients.about.com/od/atthehospital/fl/How-to-Ask-Doctors-and-Other-Providers-to-Wash-Their-Hands.htm> *

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Suzanne Rhodenizer Rose, RN, BScN, MHS, CIC

President, IPAC Canada

The cultural chasm in approaches to infection prevention and control

After the flurry of spring conferences, and on the heels of a very successful IPAC Canada National Educational Conference in magnificent Victoria, BC, my head is swimming with orcas and ideas. Many of these ideas are aimed at addressing the underlying issue for many problems within our work: the culture of safety and challenging the status quo. Objectively, can any of us say that the standard education on hand hygiene is truly working? If it was, our rates would be through the roof and everyone would “just do it” instinctively. But they don’t – our rates remain low, and we continue to deliver education to providers in the earnest hope that we will make a difference.

I give you a famous Einstein quote: *Insanity: doing the same thing over and over again and expecting different results.*

We, as practitioners, administrators and leaders in infection prevention and control are insane (well, at least according to Einstein).

We need a different approach. We need to bring best practices into normative, *daily* practices and become part of the expectations. If someone’s practices are negatively impacting their ability to provide safe care, then their

peers must be able to recognize that and require that behavior be improved. We can educate, and train, and cajole healthcare providers to wash their hands, wear their personal protective equipment appropriately, and to stop eating lunch from cleaning and med carts; however, based on history, if we only do this, we will be fighting the *same* fight this time five years from now. From where I sit, *culture* is the single most important prevention method for preventing transmission of infection. I would debate that unless you have a strong patient safety culture that supports behavior and practice change, you can educate, audit, and train until the cows come home. Our future potential will be realized, in my view, when we have fostered a strong culture of safety to support sustainability of best practice implementation.

A colleague of mine, Dr. Mark Fleming, Professor of Safety Culture at Saint Mary’s University in Nova Scotia, has lectured earnestly on the nature and importance of culture and its relationship with patient safety. In a recent presentation, Dr. Fleming spoke about how culture determines what behaviours are acceptable and which ones are verboten. We need to understand current culture so that we

can improve it and leverage it to make those best practices more than just academic musings based on scientific evidence. It’s sadly not enough to just think people are going to embrace best practices consistently because it’s the right thing to do. Therefore, if the overarching culture is one of safe practices, any outliers are not going to get invited to the next staff BBQ!

Another colleague quipped, quite sincerely, that patient safety is in their (healthcare providers) hearts but not always in their heads. Everyone intention is to do a great job and everyone wants to put their support behind best practices and strong patient safety culture; however, there is that disconnect between what we want to do, and what we often tend to execute. Not doing hand hygiene IS unsafe care; we’ve frequently cited that only about 40% of providers actually do it!

I am so passionate about building a better patient safety culture that I challenge infection prevention and control professionals across Canada to advance the charge for a positive patient safety culture, to be creative and innovative in fostering a culture to create a grassroots majority – a little collegial peer pressure will develop and those outliers will be fewer and fewer! 🍀

“I am so passionate about building a better patient safety culture that I challenge infection prevention and control professionals across Canada to advance the charge for a positive patient safety culture, to be creative and innovative in fostering a culture...”



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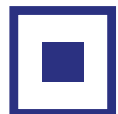
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Suzanne Rhodenizer Rose, RN, BScN, MHS, CIC

Présidente, PCI Canada

Prévention et contrôle : le gouffre culturel

Après l'agitation des congrès printaniers et dans le sillage du grand succès de la conférence éducative de PIC Canada, qui nous a réunis dans les magnifiques paysages de Victoria, en Colombie-Britannique, j'ai la tête pleine d'épaulards et d'idées. Nombre de ces idées ont trait au fondement d'une bonne part de nos problèmes : la culture de la sécurité et le renversement du *statu quo*. Objectivement, y a-t-il quelqu'un parmi nous qui soit prêt à dire que les méthodes standard d'éducation sur l'hygiène des mains sont efficaces? Si elles l'étaient, nous aurions des résultats faramineux et tout le monde « le ferait » instinctivement. Mais il n'en est rien : nos résultats restent faibles et nous continuons de faire l'éducation des prestataires de soins dans le fervent espoir que les choses vont changer.

Or, Einstein a dit : *La folie, c'est de faire toujours la même chose et d'en attendre des résultats différents.*

Nous, praticiens, administrateurs et leaders de la prévention et du contrôle des infections, sommes fous (selon Einstein, s'entend).

Il faut changer nos méthodes. Nous devons en trouver qui ont fait leurs preuves, les ériger en pratiques normatives quotidiennes et nous considérer comme une partie des résultats attendus. Si une personne emploie des méthodes qui

l'empêchent de prodiguer des soins en toute sécurité, par exemple, ses collègues doivent être en mesure de le comprendre et exiger d'elle qu'elle améliore son comportement. L'histoire démontre que nous aurons beau éduquer, former et cajoler les prestataires de soins pour qu'ils finissent par se laver les mains, porter leur équipement de protection individuelle comme il se doit et cesser de manger leur lunch sur les chariots d'entretien et de médicaments, si nous ne faisons pas davantage, nous serons encore à livrer le *même* combat dans cinq ans. À mon avis, la *culture* est le meilleur moyen de prévenir la transmission des infections. Sans une solide culture de sécurité du patient qui favorise un changement de comportement et de méthodes, vous allez éduquer, auditer et former jusqu'à la saint-glinglin... Notre potentiel ne se réalisera, à mon sens, que si nous privilégions cette culture de sécurité qui peut seule permettre la mise en œuvre durable de meilleures pratiques.

Au cours de ses conférences, mon collègue, le Dr Mark Fleming, professeur en culture de sûreté à l'Université Saint Mary, de Nouvelle-Écosse, parle avec ferveur de l'importance de la culture et des liens avec la sécurité du patient. Il soulignait récemment que la culture détermine quels comportements sont acceptables et lesquels sont frappés d'interdit. Il nous faut donc comprendre

la culture actuelle pour l'améliorer et en tirer parti afin que les pratiques exemplaires ne soient plus seulement un rêve d'universitaires malgré les preuves scientifiques. Malheureusement, il ne suffit pas de penser que les gens vont adopter ces pratiques éprouvées seulement parce que c'est la chose à faire. Dans une culture favorable à la sécurité, donc, nous bannirions toute personne qui n'y adhère pas de la liste des invités au BBQ du personnel!

Un autre collègue disait à la blague, mais non moins sincèrement, que chaque prestataire de soins a à cœur la sécurité du patient mais ne l'a pas toujours en tête. Chacun veut faire du bon travail et chacun est favorable à de meilleures pratiques et à une solide culture de sûreté, mais il y a souvent un écart entre l'intention et l'action. Ne pas se laver les mains, C'EST DANGEREUX. Pourtant, comme nous l'avons souvent rapporté déjà, seuls 40 p. 100 des prestataires de soins, environ, le font!

L'amélioration de la culture de sécurité me tient tellement à cœur que je lance un défi aux professionnels de la prévention et du contrôle des infections du Canada : montez au créneau et faites preuve de créativité et d'audace pour instaurer cette culture et arriver à constituer une solide majorité. Un peu de pression collégiale et les dissidents seront de moins en moins nombreux! 🌸

« L'amélioration de la culture de sécurité me tient tellement à cœur que je lance un défi aux professionnels de la prévention et du contrôle des infections du Canada : montez au créneau et faites preuve de créativité et d'audace pour instaurer cette culture... »

THIS JUST IN!

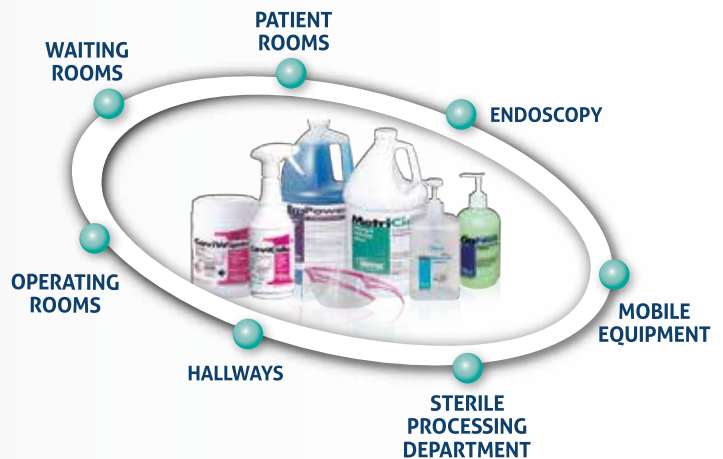
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Gerry Hansen, BA

Executive Director, IPAC Canada

Strategic Plan 2016-2018

PAC Canada has a new Strategic Plan for 2016-2018. The Strategic Plan is a dynamic and progressive guideline for our association's growth over the next three years. The IPAC Canada Board, Chapter Presidents and key leaders met for a two-day Strategic Planning Summit preceding the 2015 National Education Conference in Victoria. The participants unanimously recognized the importance of increasing profile as the means to enhancing the growth of the association and membership. As a result, there are three clear goals by which IPAC Canada will be guided.

Raise our Leadership Profile –

The objective is to increase public, government and organizational awareness of IPAC Canada through increased responsiveness to issues, increased political advocacy and influence, and establishing an international presence. The action plans include enhancement of communication and increasing engagement. An historic decision is that to grow the association's focus on public awareness and patient safety through election of a Public Representative to the Board of Directors. More information on the position will be provided in the fall of 2015.

Recalibrate our Product Mix –

Through media releases and postings, IPAC Canada will offer informed commentary on standards and guidelines across federal, provincial and territorial jurisdictions. It will accelerate the development, dissemination and distribution of audit tools, including development of an audit app. The emphasis on education will be enhanced to reflect fundamental infection control principles. We will continue to work towards the vision of the *Canadian Journal of Infection Control* as an indexed peer reviewed journal.

Grow our Capacity –

IPAC Canada will continue to promote the value of membership to key target audiences. There will be innovative use of technology to engage and educate. The relationship with industry will be built and leveraged, and there will be a directed effort to seek additional sources of funding. The mentor program that is already in development will be expanded to include mentoring of chapter executives. In addition, the Board has endorsed establishment of a Chapter Council which will be designed to bridge communication and action between the Board, administration and chapters.

For the first time, the Strategic Plan will not just be driven by the Board of Directors. Various leadership individuals and groups have been identified to determine the best action plan and facilitate moving the action plans forward. Direction and support will be provided by the Board of Directors and administration.

We would like to thank those members who responded to the online survey which set the tone for addressing the needs of membership. We would also like to thank the Board, Chapter Presidents, key leaders and staff who worked so thoughtfully and diligently to ensure a productive summit. Our gratitude goes to Dr. David Sheridan, who so expertly facilitated the two-day summit and drafted the new Strategic Plan. The Board of Directors approved the Strategic Plan 2016-2018 on June 16, 2015. It was presented to membership at the 2015 Annual General Meeting.

The 2016-2018 Strategic Plan can be found in the IPAC Canada Members Area of the website (<http://www.ipac-canada.org/Members/membersE.php>). A summary can be found at <http://www.ipac-canada.org/pdf/2015%20Strategic%20Plan%20Final%20-%20SUMMARY.pdf>. 🌸

“The participants unanimously recognized the importance of increasing profile as the means to enhancing the growth of the association and membership. As a result, there are three clear goals by which IPAC Canada will be guided.”

Our vision is an **80% reduction** in Healthcare Acquired Infections by **2024**

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Report of the Membership Fee Review Committee

In an effort to promote Chapter engagement and growth, a recommendation was put forth by the IPAC Chapter Task Force to review current membership fees and structures to determine if changes to these structures could potentially increase IPAC Canada membership. The IPAC Canada Board recommended a sub-committee of the Membership Core Committee (MCC) be formed to examine this issue and provide recommendations. IPAC Canada members appointed to the committee were:

- Susan Jacka, Alberta (Chair)
- Joanne Baines, British Columbia
- Debbie Dawe, Newfoundland and Labrador
- Jacqueline Hlagi, British Columbia
- Ewelina Dziak, Saskatchewan
- Sarah Eden, Ontario
- Leanne Harding, Ontario
- Kelly Hebert, Ontario
- Judi Linden, Manitoba
- Suzanne Rhodenizer Rose, Nova Scotia
- Michael Rotstein, Ontario

The objectives of the subcommittee were to review the current membership fee structure to determine if any changes can be made without negatively impacting the overall IPAC Canada membership revenue (used mainly for operational costs) or sharing of its resources, and provide a report of the findings to the Board. The final report of

the committee was presented to the IPAC Canada Board of Directors in June 2015.

1. That Institutional Membership Structure and Definitions Remain Unchanged:

Many organizations (including long-term care franchises and provincial health regions/authorities) have multiple sites across many geographical miles. Changing the eligibility to include members from the same organization but not working at the same physical site could result in significant revenue loss. The definition of institution is further complicated by the variation in provincial regionalization models, where the institution could be perceived as the health authority versus an individual payer or provider organization. The Board agrees and will continue the current Institutional membership structure as being “one physical site” at the fees currently in effect.

2. No Reduced Fee for Part-Time Personnel:

It would be logistically difficult and resource intensive for the Membership Services Office to define, administer and track members with part-time status. It would be difficult to justify a reduced fee for part-timers when they would still have access to full membership benefits. The Board agrees with this recommendation.

3. Reduced Fee for New Members:

Effective January 1, 2016, in the first year

of their membership, new individual members will be levied a fee equal to the student or retired fee. The reduced fee will not apply to those in an institutional membership or those replacing a current member. The new member fee would only apply once in a member’s lifetime.

4. Discounts for CIC®: Effective January 1, 2016 newly certified CIC®s will receive a \$50 discount in the membership year following their certification. This will not apply to CIC® renewals.

In 2011, at the request of membership, the Board committed to regular fee increases every two years. The Board would consider the annual national Consumer Price Index (CPI) and the association’s projected revenues. Accordingly, there was a 4% increase as of January 1, 2014. A 2% increase will be levied as of January 1, 2016.

- Individual membership: \$206
- Institutional membership
 - First representative: \$288
- Institutional membership
 - Additional representatives: \$124
- Students and Retired Members: \$124
- New member (first year): \$124

The Board thanks the Membership Core Committee and the Fee Structure Review Committee for their dedication and resolve to support both the association and our members. *

Bring in a new member

Win a complimentary 2016-2017 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.

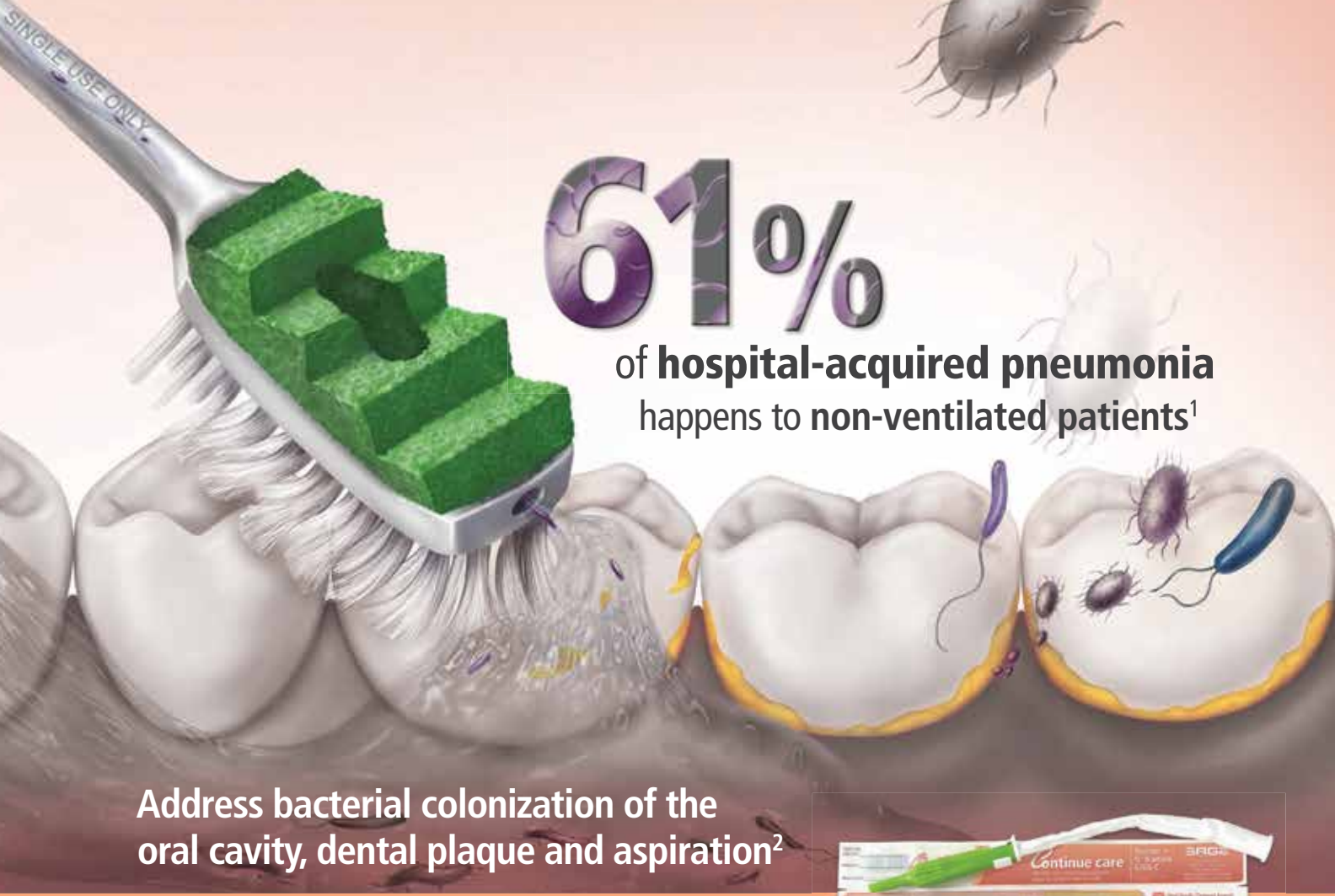
If that person joins IPAC by May 1, 2016, both you and the new IPAC Canada member will be eligible to win a complimentary 2016-2017 membership. You are eligible for the draw with every new IPAC Canada member that you get to sign up. Should the winning members

have already paid their 2016-2017 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, 2016. An announcement of the winners of this offer will be made at the 2016 conference. Membership applications can be found at http://www.ipac-canada.org/about_join.php. *

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



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A published study found that an enhanced oral care protocol reduced the rate of hospital-acquired pneumonia by more than 75%.⁴

REFERENCES: 1. Magill, SS. Multistate Point-Prevalence Survey of Health Care-Associated Infections, N Engl J Med 2014; 370:1198-208. 2. Schlieder B, et al., J Advocate Healthcare 2002 Spr/Sum, 4(1):27-30. 3. Davis, J. The Breadth of Hospital-Acquired Pneumonia: Nonventilated versus Ventilated Patients in Pennsylvania, Pennsylvania Patient Safety Advisory 2012; 9(3):99-105. 4. Robertson T, Carter D, Oral intensity: Reducing non-ventilator-associated hospital-acquired pneumonia in care-dependent, neurologically impaired patients. Canadian Journal of Neuroscience Nursing, 2013,35(2).



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New Board Members **Elected**



Suzanne Rhodenizer Rose, RN, BScN, MHS, CIC became President of IPAC Canada for a two-year term commencing June 17, 2015. She succeeds Past President Bruce Gamage who so ably represented IPAC Canada.



Molly Blake, BN, MHS, GNC(C), CIC succeeds Suzanne as President-elect for a two-year term. Molly's term as President will commence following the 2017 AGM.



Michael Rotstein, RN, BScN, MHSc, CIC, CHE became Treasurer of IPAC Canada for a three-year term commencing June 17, 2015. Michael follows the dedicated service of Judi Linden.

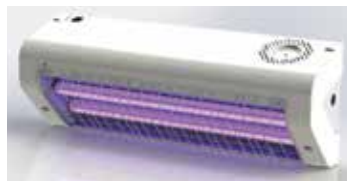


Camille Lemieux, BScPhm, MD, LLB, CIC becomes a Director of IPAC Canada for a three-year term commencing June 17, 2015. Her predecessor, Dr. Michael Gardam, served the association well in the position.

Profiles of the new Board members can be found in the winter 2014 issue of the journal.

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2015 Virox Technologies Scholarship

Through the financial support of Virox Technologies, 15 IPAC Canada members were awarded scholarships to attend the 2015 National Education conference in Victoria. 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.

- **Jeffrey Eruvvetagware**, MPH, CIC
Swift Current, SK
- **Karrie Rambridge**, BA, BScOT, CIC
Saskatoon, SK
- **Mamta Mehta**, RPN, BSc, CIC
Kitchener, ON
- **Stefania Cloutier**, BAsc, CIPHI(C), CIC
Toronto, ON
- **Lin Tang**, MD, MHA, MSBME
Toronto, ON
- **Melissa Zambrano**, MLT, CIC
Mississauga, ON
- **Greg Bruce**, A-EMCA
Midhurst, ON

- **Cheryl Collins**, BScN, CIC
Hamilton, ON
- **Kelly Hebert**, RN
Renfrew, ON
- **Zahir Hirji**, RN, BScN, MHSc, CIC
Scarborough, ON
- **Lynn Mercer**, RN, BN, CIC
Carbonear, NL
- **Lorna Morgan**, RN, BScN, CIC
London, ON
- **Wendy Runge**, RN, BScN, CIC
Calgary, AB
- **Jane Van Toen**, MLT, BSc, CIC
Toronto, ON

Virox Technologies has been a partner of IPAC Canada and has provided the necessary financial support to make these scholarships happen since 2003. Effective 2016, the scholarship will be known as the SealedAir Diversey Scholarship and will continue to provide needed funding to IPAC Canada members. Applications for the 2016 SealedAir



Diversey Scholarship are due by January 31, 2016. Online application will open in the fall of 2015. We thank both Virox and Diversey for their ongoing recognition of the value of IPAC Canada and its members. *



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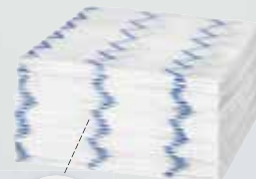
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2015 Diversey Bursary Winners

The objective of the Diversey Education 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.

Through the support of the Diversey Education Bursary, six IPAC Canada

members received conference or tuition fees in 2015:

- **Tara Leigh Donovan**, BHSc, MSc
Surrey, BC
- **Denise Kearsley**, RN, BN, CIC
Cobourg, ON
- **Lorena McLure**, RN, BN, BPE
Kelowna, BC
- **Christine Mitchell**, RN, CIC
Kitchener, ON
- **Baljinder Sidhu**, RN, BScN, CIC
Vancouver, BC
- **Jomcy Thomas**, RMCCM
Hamilton, ON

IPAC Canada thanks SealedAir Diversey for its generosity in continuing the Virox Technologies Scholarship and the



SealedAir Diversey Education Bursary through the new combined SealedAir Diversey Scholarship. *

Announcement of Sage International Attendee Scholarship

IPAC Canada and Sage Products LLC are pleased to announce the launch of the **Sage International Attendee Scholarship**. The purpose of the Scholarship is to provide financial assistance to eligible infection prevention and control professionals from under-resourced nations to attend an IPAC Canada National Education Conference.

The amount of \$5,000 will be set aside for the Scholarship by IPAC Canada and Sage Products LLC. The maximum amount granted to each recipient per award year would be the equivalent of five thousand dollars (\$5000.00 CAD). Applicants will not necessarily receive the full amount. The award will include registration for the entire conference,

including both pre- and post-conference education sessions, economy air travel, and a maximum of five (5) nights' accommodation, and meals.

DEADLINE FOR APPLICATIONS:

January 31, 2016

Criteria and application guidelines available at http://www.ipac-canada.org/ops_sage_international_scholarship.php

In additional support of international colleagues, Sage Products LLC and Webber Training supported the attendance of Dr. Jean-Paul Ngandu Mbanga from Namibia at the 2015 national education conference.

We thank Sage Products LLC for their support of IPAC Canada through



this and other significant sponsorships – the Five Best First Time Abstracts and the Moira Walker Memorial Award for International Service. *

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Source: *Public Health Agency of Canada - Infection Prevention and Control Guidance for Management in Acute Care Settings.

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2015 National Education Conference

We wish to thank our generous sponsors for their support of the 2015 IPAC Canada conference (at time of printing):

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Photos from the National Education Conference are available at www.ipac-canada.org



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- Infection Control in Dental Settings – Half Day
- Care Bundles to Multimodal Interventions
- One Health Initiative – Human and Animal Health
- Clostridium difficile
- Patients, Residents and Families – What should they know?
- Healthcare Facility Design

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Moira Walker Memorial Award for International Service 2015 Award Winner – Dr. Donna Moralejo

See full article at http://www.ipac-canada.org/opps_walkerAward.php

Moira Walker's qualities of involvement, commitment and dedication to infection prevention and control guided our selection of the ideal candidate for this award. The 2015 honoree is Professor Donna Moralejo, PhD of Memorial University School of Nursing, St. John's NL. Donna has demonstrated an extraordinary commitment to infection prevention and control on the local, national and international stage. To her colleagues in Newfoundland and Labrador, she is an advocate, a leader once serving as president of the chapter, and an educator. Nationally she served on the IPAC Canada Board of Directors as Director of Education for six years. As Director of Education she was instrumental in development of the novice ICP distance education course and has been involved with the national education conference for many years in several positions, among them Scientific Chair, Co-chair and advisor.

Donna's international work has focused on community capacity building in an effort to prevent the transmission of communicable disease and strengthen public health interventions.

Dr. Moralejo's award was presented at the 2015 Opening Ceremonies. She presented an overview of her international initiatives at the Tuesday morning, Champions of Infection Prevention and Control Breakfast. ❁

This award was made possible through the support of



Bruce Gamage presents Moira Walker Award to Donna Moralejo.



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¹Alfa, M.J., Lo, E., Olson, N., MacRae, M., Buelow-Smith, L. Use of a daily disinfectant cleaner instead of a daily cleaner reduced hospital-acquired infection rates, *Am J Infect Control* 2015; 43: 141-6



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